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## 10월 17일 목요일

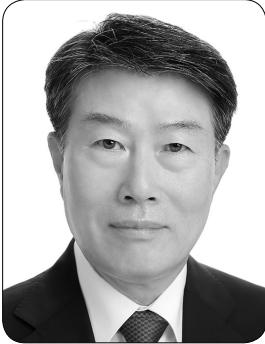
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## 인사말



### 권삼현

제25차 이비인후과 종합학술대회장

존경하는 대한이비인후과학회 회원 여러분!

안녕하십니까? 제25차 이비인후과 종합학술대회 대회장 권삼현입니다.

회원 여러분들을 모시고 낭만의 도시 여수에서 학술대회를 열게 되어 진심으로 기쁘게 생각합니다. 이번 종합학술대회는 대한이비인후과의 8개의 분과학회 및 유관학회가 공동으로 구성하여 그동안의 연구 성과에 대해 발표하고 토론하는 자리입니다. 회원 여러분들의 학술 정보의 교류와 이비인후과의 향후 발전에 밑거름이 될 소중한 대회가 될 것입니다.

이번 학술대회 장소는 본래 전주에서 진행되어야 마땅하나, 전주에 아직 대규모의 컨벤션 센터의 부재로 말미암아 부득이 호남지역 항구도시인 여수에서 진행하게 되었습니다. 대회장인 여수컨벤션센터는 여수EXPO가 치뤄진 곳입니다. 더구나 이곳은 여수엑스포역에 가까이 위치하고 있어, 전국 어디서나 3시간 전후에 도착할 수 있는 교통의 요지입니다. 또한 여수는 최근 관광의 명소로 부상하고 있습니다. 컨벤션센터 근처에 숙박시설 또한 완비되어 천혜의 자연경관에서 맛과 멋을 즐기며 학술활동을 전개할 수 있는 최적의 도시이기도 합니다.

성공적인 학술대회 개최를 위해 물심양면으로 지원해 주신 이재서 이사장님과 구자원 총무이사님, 고윤우 학술이사님, 그리고 집행부 교수님들께 깊은 감사를 표합니다. 각 분과학회 및 유관학회 회장님과 임원진 여러분들, 그리고 준비하는 과정에 물심양면으로 도움을 주신 전북대 이비인후과 동문제위께도 감사드립니다.

회원 여러분!

2019년 10월 17일, 18일 양일간에 걸쳐 펼쳐지는 제25차 이비인후과 종합학술대회에 여러분들을 초대합니다. 바쁘시더라도 참석하시어 선후배 동료들의 정을 느끼고 이비인후과 학술 발전에 기여하는 데에 일조하여 주시기를 당부드립니다. 금번 학술대회 기간 중에 국제 규모의 여수컨벤션에서 쾌적함을 느껴 보시고, 온통 낭만으로 가득찬 오동도와 여수 밤바다를 마음껏 즐기시기를 기원합니다. 감사합니다.

## 종합학술대회: 이비인후과학회 이사장 및 분과/유관학회 회장



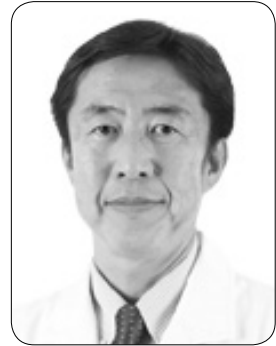
이재서  
대한이비인후과학회  
이사장



정광윤  
대한이비인후과학회  
부이사장



홍일희  
대한이비인후과학회  
부이사장



채성원  
대한이과학회  
회장



김성완  
대한비과학회  
회장



김세현  
대한갑성선두경부외과학회  
회장



이준호  
대한청각학회  
회장



김관민  
대한기관식도과학회  
회장



이병주  
대한후두음성언어의학회  
회장



김정수  
대한안면성형재건학회  
회장



정유삼  
대한소아이비인후과학회  
회장

## 임원 및 위원

대한이비인후과학회 임원 명단(2019)	
이 사 장	이재서
부 이 사 장	정광윤
	홍일희
총 무 이 사	구자원
고 시 이 사	조광재
수 련 이 사	최승호
간 행 이 사	박경호
학 술 이 사	고윤우
재 무 이 사	이일우
제 1 보 험 이 사	이승훈
제 2 보 험 이 사	이세영
의 무 이 사	김진국
홍 보 이 사	예미경
기 획 이 사	이준호
개 원 이 사	신광철
법 제 윤 리 이 사	임상철
교 육 연 구 이 사	채성원
국 제 이 사	박시내
사 회 공 헌 이 사	박일석
차 기 이 사 장	조양선
감 사	김정수
	이상덕

제25차 이비인후과 종합학술대회 조직위원	
학 술 대 회 장	권삼현
위 원 장	고윤우
간 사	김성현
위 원	구자원
	권성근
	김동영
	김성원
	김수환
	김태훈
	김현직
	박정제
	백승국
	변재용
	안순현
	안중호
	이소윤
	이종대
	정만기
	조규섭
	최병윤
	최지윤
	홍현준
	황찬호
*가나다 순	

분과 및 유관학회 회장	
대 한 이 과 학 회	채성원
대 한 비 과 학 회	김성완
대한갑상선두경부외과학회	김세현
대 한 청 각 학 회	이준호
대한기관식도과학회	김관민 (홍부외과)
대한후두음성언어의학회	이병주
대한안면성형재건학회	김정수
대한소아이비인후과학회	정유삼

분과 및 유관학회 학술이사	
대 한 이 과 학 회	최병윤
대 한 비 과 학 회	김현직
대한갑상선두경부외과학회	안순현
대 한 청 각 학 회	안중호
대한기관식도과학회	권성근
대한후두음성언어의학회	권성근
대한안면성형재건학회	최지윤
대한소아이비인후과학회	김수환

## 공식행사 안내

### 10월 17일 목요일

Opening ceremony 09:00~09:20

엑스포홀

Plenary session 09:20~10:00

엑스포홀 Chairperson(s) : 권삼현(전북의대)

리더의 말과 글

강원국(전북대 초빙교수)

Congress photo 10:00~10:10

엑스포홀

원로회원 오찬 12:00~13:30

여수 한일관

간담회 18:00~20:00

엠블호텔

### 10월 18일 금요일

의료법 및 의료감정의 주요쟁점 1 13:10~14:10

세미나실5

수련병원과장회의 12:20~13:10

그랜드홀 2

## 분과학회 및 유관학회 회의 일정

### 10월 17일 목요일

시간	행사명	장소 (Room)
7:00-8:00	대한후두음성언어의학회 상임이사회	유타마리나호텔& 리조트 그리니치 A

### 10월 18일 금요일

시간	행사명	장소 (Room)
7:00-8:00	제9차 대한이과학회 상임이사회	유타마리나호텔& 리조트 2층VIP대기실
7:00-8:00	대한비과학회 상임이사회	유타마리나호텔& 리조트 오션베이홀
7:00-8:00	대한갑상선두경부외과학회 정기이사회	유타마리나호텔& 리조트 그리니치 A
7:00-8:00	대한청각학회 평의원회	유타마리나호텔& 리조트 그랜드볼룸
7:00-8:00	대한기관식도과학회 상임이사회	유타마리나호텔& 리조트 그리니치 B

# 프로그램 안내

## 10월 17일 목요일

### [이비인후과 건강공개강좌]

10:30~12:30

엑스포홀

사회: 이은정(전북의대)

1. 축하 및 인사말씀  
이재서(대한이비인후과학회 이사장)
2. 우리아이 코골이! 왜 치료해야 할까요?  
김성완(대한비과학회 회장)
3. 귀가 잘 안들려요  
이준호(대한청각학회 회장)
4. 갑상선암의 수술적 치료  
정만기(대한갑상선두경부외과학회 홍보이사)
5. 갑상선암과 음성  
이병주(대한후두음성언어의학회 회장)
6. 우리 아이 감기, 비염, 축농증, 뭐가 다른가요?  
정유삼(대한소아이비인후과학회 회장)
7. 보청기는 어떤 것을 선택해야 하는가?  
채성원(대한이과학회 회장)
8. 질의 및 응답

### [대한이과학회 해외연자 특강]

10:30~11:00

그랜드홀1

Chairperson(s): 채성원(고려의대)

ENHANCING COCHLEAR HEALTH FOR IMPROVING  
OUTCOMES OF COCHLEAR IMPLANTATION  
YEHOASH RAPHAEL (UNIVERSITY OF MICHIGAN)

### [대한이과학회 Symposium] Inner ear research and translation to the clinic

11:00~12:30

그랜드홀1

Chairperson(s): 오승하(서울의대), 최재영(연세의대)

1. CELL REPLACEMENT THERAPY FOR TREATING  
BALANCE AND HEARING DISORDERS  
Yehoash Raphael (University of Michigan)
2. INNER EAR DAMAGE AND PROTECTION STRATEGIES  
박용호(충남의대)
3. INNER EAR PHOTOBIMODULATION  
정재윤(단국대의대)
4. GENE-BASED OTOLOGY CLINICAL PRACTICE  
최병윤(서울의대)
5. NANOPARTICLE-BASED INTRATYMPANIC DRUG  
DELIVERY FOR TREATMENT OF INNER EAR DISEASE  
김동기(가톨릭의대)

### [대한갑상선두경부외과학회 Symposium] Oral cavity cancer

10:30~12:30

그랜드홀2

Chairperson(s): 정광윤(고려의대), 김세현(연세의대)

1. HPV RELATED CANCER - ORAL CAVITY CANCER CAN BE  
RELATED?  
이세영(중앙의대)
2. CHALLENGES OF THE ORAL CANCER BURDEN IN ASIA  
Patravoot Vatanas (Khon Kaen University)
3. RESECTION MARGIN CONTROL  
이도영(서울의대)
4. SUBLINGUAL LYMPH NODE - IMPORTANCE AND  
MANAGEMENT  
주영훈(가톨릭의대)
5. PROGNOSTIC MARKERS IN ORAL CAVITY CANCER  
PATIENTS  
노종렬(울산의대)
6. MANAGEMENT OF ORAL CANCER IN CHULALONGKORN  
UNIVERSITY  
Napadon Tangjaturonrasme (Chulalongkorn University)

# 프로그램 안내

## 10월 17일 목요일

### [대한소아이비인후학회 Symposium 1] Allergic rhinitis

10:30~11:30

세미나실1

Chairperson(s): 정유삼(울산의대)

#### 1. LOCAL IMMUNE RESPONSE IN ALLERGIC RHINITIS (CHILDREN VS. ADULTS)

조석현(한양의대)

#### 2. PEDIATRIC IMMUNOTHERAPY IN PEDIATRIC ALLERGIC RHINITIS

김선태(가천의대)

#### 3. RECENT UPDATE IN PEDIATRIC ALLERGIC RHINITIS

배정호(이화의대)

### [대한소아이비인후학회 Symposium 2]

#### Congenital cholesteatoma in pediatric otology

11:30~12:30

세미나실1

Chairperson(s): 김영호(서울의대)

#### 1. INCIDENCE, ETIOLOGY AND PATHOGENESIS OF CHOLESTEATOMA IN CHILDREN

오정훈(가톨릭의대)

#### 2. SURGERY FOR CONGENITAL AND ACQUIRED CHOLESTEATOMA IN CHILDREN

임기정(고려의대)

#### 3. ENDOSCOPIC MANAGEMENT OF PEDIATRIC CHOLESTEATOMA

문일준(성균관대의대)

### [대한소아이비인후학회 Symposium 3]

#### Practical tips and pitfalls on pediatric surgery

13:30~14:30

세미나실1

Chairperson(s): 김철호(아주의대)

#### 1. SURGERY OF PEDIATRIC HEAD AND NECK MALIGNANCY

박준희(조선의대)

#### 2. SURGERY OF PEDIATRIC SALIVARY GLAND DISEASE

김정규(대구가톨릭의대)

#### 3. SURGERY OF PEDIATRIC AIRWAY DISEASE

권성근(서울의대)

### [대한청각학회 Symposium] Most advances in hearing aid techniques

13:30~15:30

그랜드홀1

Chairperson(s): 이준호(서울의대)

#### 1. DIAGNOSIS OF COCHLEAR DEAD REGIONS AND THE STRATEGIES TO OVERCOME THEM

심현준(울지의대)

#### 2. 소음 환경하의 보청기 청취향상을 위한 전략

박무균(서울의대)

#### 3. WIRELESS TECHNOLOGIES의 발전과 가능성

이규엽(경북의대)

#### 4. TELEAUDIOLOGY와 보청기 적합

김진숙(한림대 청각학부)

#### 5. 보청기와 인공지능의 미래

송재진(서울의대)

### [대한비과학회 해외연자 특강]

13:30~14:00

그랜드홀2

Chairperson(s): 김성완(경희의대)

#### BIOLOGIC THERAPY FOR NASAL POLYPS

조성호(UNIVERSITY OF SOUTH FLORIDA)



# 프로그램 안내

## 10월 17일 목요일

[대한비과학회 Symposium] Advanced endoscopic surgery in rhinology as a surgical option for PNS tumors

14:00~15:30 그랜드홀2

Chairperson(s) : 조진희(가톨릭의대)

1. TRANSNASAL ENDOSCOPIC APPROACH FOR SINONASAL INVERTED PAPILLOMA

김현직(서울의대)

2. ENDOSCOPIC TRANSPTERYGOID APPROACH FOR ANGIOFIBROMA

김성원(가톨릭의대)

3. ENDOSCOPIC SURGERY FOR FIBRO-OSSEOUS TUMORS: WHEN & HOW

조규섭(부산의대)

4. ENDOSCOPIC SURGERY FOR NASOPHARYNGEAL TUMORS: APPROACH & SURGICAL TECHNIQUES

원태빈(서울의대)

5. ENDOSCOPIC SURGERY FOR MENINGOENCEPHALOCELE

홍상덕(성균관의대)

6. THE ROLE OF ENDOSCOPIC RESECTION FOR PNS MALIGNANT TUMORS

임상철(전남의대)

[두개저 Symposium] Management of small to medium sized vestibular schwannoma

15:50~16:50 그랜드홀1

Chairperson(s) : 정종우(울산의대)

1. IMAGING UPDATES OF VESTIBULAR SCHWANNOMA

김진아(연세대 영상의학과)

2. GAMMA KNIFE RADIOSURGERY FOR SMALL TO MEDIUM SIZED VESTIBULAR SCHWANNOMA

정신(전남대 신경외과)

3. SURGICAL MODALITIES

장기홍(가톨릭의대)

4. QUALITY OF LIFE ACCOUNTING MANAGING MODALITIES

김현지(인하의대)

[윤리교육 심포지움]

15:50~16:50

그랜드홀2

Chairperson(s) : 채성원(고려의대)

1. 의료분쟁조정법

윤동빈 행정사무관(보건복지부 의료기관정책과)

2. 법조인이 원하는 의료분쟁 예방팁

전선룡 변호사(대한의사협회 법제이사)

3. 다빈도로 발생하는 의료분쟁 사례

박재우 변호사(의료배상공제조합/법무법인 21세기)

[보험세미나]

13:30~15:30

세미나실5

1. 심사체계 개편과 최신 정책동향

이중규(보건복지부)

2. 의료환경 변화에 따른 이비인후과의 대처

양훈식(건강보험심사평가원)

3. 휴식

4. 환자분류체계의 과거, 현재, 그리고 미래

박찬순(가톨릭의대)

5. 자유토론

# 프로그램 안내

10월 18일 금요일

[대한후두음성언어학회 Symposium & Panel discussion]  
Recurrent respiratory papillomatosis

08:00~10:00

그랜드홀1

Chairperson(s) : 이병주(부산의대),  
Moderator : 홍기환(전북의대)

1. BASIC/EPIDEMIOLOGY

석준걸(국립암센터)

2. PREVENTION, VACCINATION/MEDICATION  
ADJUVANT RX. OF RECURRENT RESPIRATORY  
PAPILLOMATOSIS(RRP)

이동근(동아의대)

3. SURGICAL MANAGEMENT OF RECURRENT  
RESPIRATORY PAPILLOMATOSIS

임재열(연세의대)

4. AGGRESSIVE RRP: TRACHEOBRONCHIAL SPREAD &  
MALIGNANT TRANSFORMATION

정우진(서울의대)

5. PANEL DISCUSSION

남순열(울산의대), 박영학(가톨릭의대), 정필상(단국의대),  
손진호(경북의대), 손영익(성균관의대), 진성민(성균관의대),  
김형태(예송이비인후과)

[대한비과학회 Panel discussion] Septoturbinoplasty: what  
have we been doing for 100 years?

08:00~10:00

그랜드홀2

Chairperson(s) : 박동준(연세원주의대), Moderator : 박동준(원  
주연세의대)

1. SURGICAL TECHNIQUES FOR CAUDAL OR HIGH SEPTAL  
DEVIATION

김효열(성균관의대)

2. MANAGEMENT OF COMPLICATIONS AFTER  
SEPTOPLASTY

배정호(이화의대)

3. INTRODUCING FOR DEVICES OF TURBINOLASTY

허성재(경북의대)

4. SEPTOTURBINOLASTY IN PEDIATRICS : WHAT SHOULD  
BE DONE OR NOT

김수환(가톨릭의대)

5. REVISION SEPTOTURBINOLASTY: WHEN, HOW, AND  
TIPS

김태훈(고려의대)

6. VOTING SESSION: MY PREFERENCE IN SEPTOTURBINO-  
PLASTY

[대한기관식도과학회 Symposium]  
Management of complication in bronchoesophageal

10:20~12:20

그랜드홀1

Chairperson(s) : 김관민(서울의대), 김진평(경상의대)

1. POSTOPERATIVE ASPIRATION

박영학(가톨릭의대)

2. NON-SURGICAL MANAGEMENT OF TRACHEO-  
ESOPHAGEAL FISTULA

김호중(성균관대 호흡기내과)

3. SURGICAL MANAGEMENT OF TRACHEO-ESOPHAGEAL  
FISTULA

조종호(성균관대 흉부외과)

4. ENDOSCOPIC VACUUM-ASSISTED CLOSURE THERAPY  
IN THE MANAGEMENT OF POSTOPERATIVE LEAKAGE  
AFTER ESOPHAGECTOMY

전재현(서울대 흉부외과)

5. NONSURGICAL MANAGEMENT OF INTRACTABLE  
ESOPHAGEAL STENOSIS

이항락(한양대 소화기내과)

6. MANAGEMENT OF CHYLE LEAKAGE

정한신(성균관의대)

# 프로그램 안내

## 10월 18일 금요일

### [대한안면성형재건학회 Panel discussion] Challenges in rhinoplasty

10:20~12:20 그랜드홀2

Chairperson(s) : 김정수(경북의대), Moderator : 김영호(인하의대)

1. CHALLENGES IN PRIMARY RHINOPLASTY  
이건희(경희의대)
2. CHALLENGES IN THE REVISION RHINOPLASTY  
장용주(울산의대)
3. THE CASES THAT CHANGED MY PRACTICE  
최지윤(조선의대)
4. DIFFICULT PATIENTS OF RHINOPLASTY  
진홍률(닥터진 이비인후과)
5. VOTING SESSION: PRACTICES IN RHINOPLASTY

### [Satellite symposium] Thai Society for Head and Neck Oncology

10:20~11:50 세미나실5

Chairperson(s) : Choakchai Metheetrairut, Pornake Apipan

1. NEW THERAPEUTIC STRATEGIES FOR REGENERATION OF SALIVARY DYSFUNCTION  
최정석(인하의대)
  2. PRINCIPLE OF SURGERY IN SALIVARY GLAND CANCER  
Kitti Jantarapattana(Prince of Songkla University)
  3. EXTENDED APPLICATION OF ROBOTIC SURGERY FOR SALIVARY GLAND NEOPLASM  
고윤우(연세의대)
  4. MANAGEMENT OF THE FACIAL NERVE IN PAROTID CANCER  
Napadon Tangjaturonrasme(Chulalongkorn University)
- DISCUSSION

### [대한이과학회 Panel discussion] Minimizing cholesteatoma recidivism

13:10~15:10 그랜드홀1

Chairperson(s) and Moderator : 정원호(성균관의대)

1. CANAL WALL DOWN TYMPANOMASTOIDECTOMY  
박시내(가톨릭의대)
2. CANAL WALL UP TYMPANOMASTOIDECTOMY  
김형중(한림의대)
3. ENDOSCOPIC SURGERY FOR CHOLESTEATOMA  
조형호(전남의대)
4. EUSTACHIAN TUBE SURGERY FOR CHOLESTEATOMA  
공수근(부산의대)

#### PANEL DISCUSSION

김형중(한림의대), 강명구(동아의대), 이준호(서울의대), 박시내(가톨릭의대), 조형호(전남의대), 공수근(부산의대)

### [대한갑상선두경부외과학회 Panel discussion] Salivary gland tumor

13:10~15:10 그랜드홀2

Chairperson(s) : 봉정표(연세원주의대), Moderator : 정한신(성균관의대), 김철호(아주의대)

조광재(가톨릭의대), 우정수(고려의대), 박일석(한림의대), 박정제(경상의대)

# Education program 안내

## 10월 17일 목요일

[Education program I]	
13:30~14:30	세미나실4
Chairperson(s) : 문인석(연세의대)	
여수탐방	
유남이(여수관광해설사협회)	

[Education program II]	
14:30~15:30	세미나실1
Chairperson(s) : 임재열(연세의대)	
JOURNEY TO THE PAST: HISTORY OF THYROID SURGERY	
박재홍(순천향의대)	

[Education program III]	
14:30~15:30	세미나실4
Chairperson(s) : 임기정(고려의대)	
WINE STORY : CHAMPAGNE	
정필상(단국의대)	

[Education program IV]	
15:50~16:50	세미나실1
Chairperson(s) : 김현직(서울의대)	
REVIEW OF SLEEP STAGE SCORING AS AASM SLEEP SCORING MANUAL VERSION 2.5 ON POLYSOMNOGRAPHY	
이승훈(고려의대)	

[Education program V]	
15:50~16:50	세미나실4
Chairperson(s) : 이환호(고신의대)	
싱글몰트 위스키의 이해	
안중호(울산의대)	

## 10월 18일 금요일

[Education Program VI]	
10:20~11:20	세미나실3
Chairperson(s) : 조석현(한양의대)	
WEARABLES IN RHINOLOG	
김정훈(서울의대)	

[Education Program VII]	
11:20~12:20	세미나실2
Chairperson(s) : 이진춘(부산의대)	
히말라야 트레킹	
봉정표(연세원주의대)	

[Education Program VIII]	
11:20~12:20	세미나실4
Chairperson(s) : 정용기(성균관의대)	
ADOBE ILLUSTRATOR를 활용한 논문 'FIGURE' 정리 방법	
장동수(연세의대)	

[Education Program IX]	
13:10~14:10	세미나실4
Chairperson(s) : 박계훈(순천향의대)	
초보자를 위한 엔드노트 강의	
송재진(서울의대)	

[Education Program X]	
14:10~15:10	세미나실4
Chairperson(s) : 김한수(이화의대)	
알아 두면 평생 써먹는 수술 술기	
이형신(고신의대)	

# Video session 안내

## 10월 17일 목요일~18일 금요일

### [이과 Video session]

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

엑스포홀 로비

STAPEDOTOMY USING SKEETER DRILL OR LASER

박시내(가톨릭의대)

TRANSLABYRINTHINE APPROACH A BEGINNERS GUIDE

손은진(연세의대)

REMOVAL AND RECONSTRUCTION OF ATTIC CHOLE-  
STEATOMA

정종우(울산의대)

COMPARISON OF THE PROS AND CONS BETWEEN  
MIDDLE FOSSA AND RETROSIGMOID APPROACH IN  
MICROSURGERY OF ACOUSTIC TUMOR

장기홍(가톨릭의대)

### [비과 Video session]

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

엑스포홀 로비

CORRECTIVE RHINOPLASTY USING EXTRACORPOREAL  
SEPTOPLASTY TECHNIQUE

심우섭(충북의대)

SEPTAL CARTILAGE TRACTION SUTURE TECHNIQUE FOR  
CAUDAL SEPTOPLASTY

조규섭(부산의대)

TONGUE BASE SURGERY IN OBSTRUCTIVE SLEEP APNEA

김현직(서울의대)

Video Session은 엑스포홀 2층 로비에 설치된 컴퓨터에서  
재생하여 보실 수 있습니다.

### [두경부 Video session]

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

엑스포홀 로비

FUNCTIONAL IMAGING FOR EVALUATION OF VOCAL  
FOLDS VIBRATION

왕수건, 이진춘, 이연우(부산의대)

PULL-THROUGH RESECTION IN ADVANCED TONGUE  
CANCER

백승국(고려의대)

DIVERSE MICROSURGICAL TECHNIQUES IN HEAD AND  
NECK RECONSTRUCTION

정만기(성균관의대)

RECONSTRUCTION OF THE DEFECTS AFTER TRANSORAL  
RESECTION OF TONSILLAR CANCER

김민식(가톨릭의대)

PAROTIDECTOMY A TO Z

홍현준(가톨릭관동의대)



## 제25차 이비인후과 종합학술대회 프로그램

10월 17일 목요일

Time	엑스포홀	그린드홀1	그린드홀 2	세미나실1	세미나실2	세미나실3	세미나실4	세미나실5	세미나실6	세미나실7	엑스포홀 2층 로비	컨퍼런스홀 1층 로비
07:50-08:50		OTOP 1 외이기관 및 안면신경 외상 및 종양	HNOP 1 두경부/감상선/후두음성 기초 및 중개연구 1	RHOP 1 수면장애Ⅰ	OTOP 2 기타기초	HNOP 2 감상선 Ⅰ	RHOP 2 알레르기 기초Ⅰ					
08:50-09:00												
09:00-09:20	Opening ceremony											
09:20-10:00	Plenary session											
10:00-10:10	Congress photo											
10:10-10:30	COFFEE BREAK											
10:30-11:00	이비인후과 건강공개강좌	대한이과학회 해외연자 특강	대한갑상선두경부외과학회 Symposium Oral cavity cancer	대한소아이비인후과학회 Symposium 1 Allergic rhinitis	OTOP 3 종이기초	HNOP 3 두경부/감상선/후두음성 기초 및 중개연구 Ⅱ	RHOP 3 부비동염 기초Ⅰ	HNOP 4 기타 두경부 질환	TPP (이과 Ⅱ)			
11:00-11:30		대한이과학회 Symposium Inner ear research and translation to the clinic		대한소아이비인후과학회 Symposium 2 Congenital cholesteatoma in pediatric otology	OTOP 4 내이질환	HNOP 5 감상선 Ⅱ	RHOP 4 후각 및 기타					
11:30-12:30												
12:30-13:30	Lunch (웨딩홀 식당)				원로회원 오찬 (여수 한일관)	Lunch (웨딩홀 식당)					Video session	Poster 전시 이과 비과 두경부
13:30-14:00		대한청각학회 Symposium Most advances in hearing aid techniques	대한이과학회 해외연자 특강	대한소아이비인후과학회 Symposium 3 Practical tips and pitfalls on pediatric surgery	OTOP 5 종이질환Ⅰ	RHOP 5 비중격수술	Education program 1 여수담방	보형세미나	TPP (이과 Ⅱ)			
14:00-14:30			대한이과학회 Symposium	대한소아이비인후과학회 Symposium 3 Practical tips and pitfalls on pediatric surgery	OTOP 5 종이질환Ⅰ	RHOP 5 비중격수술	Education program 1 여수담방					
14:30-15:30			Education program 2 Journey to the Past: History of Thyroid Surgery									
15:30-15:50	COFFEE BREAK											
15:50-16:50		두개저 Symposium Management of small to medium sized vestibular schwannoma	윤리교육 심포지움 <필수과정>	Education program 4 Review of Sleep Stage Scoring as Aasm Sleep Scoring Manual Version 2.5 on Polysomnography	OTOP 7 청각치료 및 재활Ⅰ	RHOP 7 부비동염Ⅰ	Education program 5 싱글몰트 위스키의 이해					
16:50-18:00												
18:00-20:00	간담회 (영동호텔)											

## 이비인후과 건강공개강좌

10:30~12:30 • 엑스포홀  
사회 : 이은정(전북의대)

### 1. 축하 및 인사말씀

이재서 (대한이비인후과학회 이사장)

### 2. 우리아이 코골이! 왜 치료해야할까요?

김성완 (대한비과학회 회장)

### 3. 귀가 잘 안들려요

이준호 (대한청각학회 회장)

### 4. 갑상선암의 수술적 치료

정만기 (대한갑상선두경부외과학회 홍보이사)

### 5. 갑상선암과 음성

이병주 (대한후두음성언어의학회 회장)

### 6. 우리 아이 감기, 비염, 축농증, 뭐가 다른가요?

정유삼 (대한소아이비인후과학회 회장)

### 7. 보청기는 어떤 것을 선택해야 하는가?

채성원 (대한이과학회 회장)

10:30~10:45

### 축사 및 인사말씀

(대한이비인후과학회 이사장)

이재서

10:45~11:00

### 우리아이 코골이! 왜 치료해야할까요?

대한비과학회 회장

김성완

11:00~11:15

### 귀가 잘 안들려요

대한청각학회 회장

이준호

11:15~11:30

### 갑상선암의 수술적 치료

<sup>1</sup>대한갑상선두경부외과학회 회장, <sup>2</sup>대한갑상선두경부외과학회  
홍보이사

김세현<sup>1</sup>, 정만기<sup>2</sup>

11:30~11:45

### 갑상선암과 음성

대한후두음성언어의학회 회장

이병주

11:45~12:00

### 우리 아이 감기, 비염, 축농증, 뭐가 다른가요?

대한소아이비인후과학회 회장

정유삼

12:00~12:15

### 보청기는 어떤 것을 선택해야 하는가?

대한이과학회 회장

채성원



12:15~12:30

질의 및 응답

## 대한이과학회 해외연자 특강

10:30~11:00 • 그랜드홀1  
Chairperson(s) : 채성원(고려의대)

10:30~11:00

### ENHANCING COCHLEAR HEALTH FOR IMPROVING OUTCOMES OF COCHLEAR IMPLANTATION

UNIVERSITY OF MICHIGAN

YEHOASH RAPHAEL

11:00~11:20

### CELL REPLACEMENT THERAPY FOR TREATING BALANCE AND HEARING DISORDERS

UNIVERSITY OF MICHIGAN

YEHOASH RAPHAEL

## 대한이과학회 Symposium

Inner ear research and translation to the clinic

11:00~12:30 • 그랜드홀1  
Chairperson(s) : 오승하(서울의대), 최재영(연세의대)

11:20~11:35

### INNER EAR DAMAGE AND PROTECTION STRAT- EGIES

DEPARTMENT OF OTOLARYNGOLOGY, CHUNGNAM  
NATIONAL UNIVERSITY COLLEGE OF MEDICINE

YONG-HO PARK

#### 1. CELL REPLACEMENT THERAPY FOR TREAT- ING BALANCE AND HEARING DISORDERS

YEHOASH RAPHAEL (UNIVERSITY OF MICHIGAN)

#### 2. INNER EAR DAMAGE AND PROTECTION STRATEGIES

YONG-HO PARK (DEPARTMENT OF OTOLAR-  
YNGOLOGY, CHUNGNAM NATIONAL UNIVERSITY  
COLLEGE OF MEDICINE)

#### 3. INNER EAR PHOTOBIOMODULATION

Damage to the inner ear can occur in a variety of ways, including drugs, noise, surgery or metabolic diseases, and congenital disorders. This study intro-  
duces some of the experimentally induced animal models of various inner ear damages (especially noise and surgery) and discusses the therapeutic approach of dexamethasone. Noise was used to model temporal or permanent hearing loss, and surgical inner ear model induced cochleostomy or intracochlear bleeding mod-  
el. Changes in the inner ear were observed by various

functional, histopathological, and molecular biological methods. The application of dexamethasone was observed by time of day or by administration method.

11:35~11:50

#### INNER EAR PHOTOBIO-MODULATION

DEPARTMENT OF ORL-HNS, COLLEGE OF MEDICINE,  
DANKOOK UNIVERSITY

JAE YUN JUNG

Photobiomodulation(PBM) with low level light therapy is one of numerous therapeutic modalities which have been tried to rescue hearing loss for decades. PBM has been used in many clinical situations, such as carpal tunnel syndrome, wound healing, alopecia, etc. Main therapeutic mechanism is believed to be through PBM rather than tissue heating or temperature change. PBM in otologic disease is still not widely accepted in clinical setting partly due to lack of its clinical evidences, and relative difficulty of access to target organ unlike musculoskeletal system. Recently Photobiomodulation with specified set of wavelengths of low level light using animal models has been showing its possible role in inner ear diseases including noise induce hearing loss, aminoglycoside induced hair cell loss, auditory neuropathy and salicylate induce tinnitus. In this presentation, research evidences of PBM for animal models with either cochlear hair cell damage or auditory neuron will be addressed and underlying mechanism of PBM will be discussed.

11:50~12:05

#### GENE-BASED OTOLOGY CLINICAL PRACTICE

SEOUL NATIONAL UNIVERSITY BUDANG HOSPITAL

BYUNG-YOON CHOI

12:05~12:20

#### NANOPARTICLE-BASED INTRATYMPANIC DRUG DELIVERY FOR TREATMENT OF INNER EAR DISEASE

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

DONG-KEE KIM

The intratympanic delivery of nanocarriers would provide an opportunity to treat sensorineural hearing loss or at least prevent serious progression of hearing loss originating from damage to hair cells and spiral ganglion neurons (SGN) in the cochlea of the inner ear. Many drugs have been developed in attempts to induce regeneration of hair cells and thus restore hearing. Unfortunately, however, few drugs can reach the target site of action at therapeutic concentrations in the inner ear by systemic route, because of the blood labyrinth barrier (BLB). Further, therapeutic levels of drugs in the inner ear may require high systemic doses, which are often associated with undesirable side effects. Strategies for intracochlear delivery will attempt to substantially increase the drug bioavailability in the inner ear and would have the highest efficiency among inner ear delivery methods, but, surgical manipulation of the ear for intracochlear delivery would have significant risk of deafness. Therefore, the intratympanic route has attracted a great deal of interest for local drug delivery, performed via the injection or perfusion of drugs into the middle ear and drug diffusion into the inner ear through the round window membrane (RWM) or the annular ligament on the oval window (OW). In this lecture, we focus on studies in the otologic field using nanoparticles. The use of nanoparticles is a promising therapy for inner ear disease. The ideal nanocarrier should be able to permeate the RWM or the annular ligament on OW, be capable of specific targeting, provide controlled release of the

loaded materials, and be safe in the inner ear. Many studies have attempted to deliver drugs, genes, and growth factors to the inner ear in vivo, and promising results have been reported. The safe and effective delivery of drugs or genes will be an important advancement for the treatment of many inner ear diseases.

## 대한갑상선두경부외과학회 Symposium

Oral cavity cancer

10:30~12:30 • 그랜드홀2

Chairperson(s) : 정광윤(고려의대), 김세현(연세의대)

### 1. HPV RELATED CANCER - ORAL CAVITY CANCER CAN BE RELATED?

SEI YOUNG LEE (DEPARTMENT OF OTOLARYNGOLOGY, COLLEGE OF MEDICINE, CHUNG-ANG UNIVERSITY)

### 2. CHALLENGES OF THE ORAL CANCER BURDEN IN ASIA

PATRAVOOT VATANASAPT (DEPARTMENT OF OTORHINOLARYNGOLOGY, KHON KAEN UNIVERSITY, KHON KEAN, THAILAND)

### 3. RESECTION MARGIN CONTROL

DOH YOUNG LEE (SEOUL NATIONAL UNIVERSITY BORAMAE MEDICAL CENTER)

### 4. SUBLINGUAL LYMPH NODE - IMPORTANCE AND MANAGEMENT

YOUNG HOON JOO (DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, THE CATHOLIC UNIVERSITY OF KOREA, COLLEGE OF MEDICINE)

### 5. PROGNOSTIC MARKERS IN ORAL CAVITY CANCER PATIENTS

JONG-LYEL ROH (DEPARTMENT OF OTOLARYNGOLOGY, UNIVERSITY OF ULSAN COLLEGE OF

MEDICINE, SEOUL, REPUBLIC OF KOREA)

### 6. MANAGEMENT OF ORAL CANCER IN CHULALONGKORN UNIVERSITY

NAPADON TANGJATURONRASME (DEPARTMENT OF OTOLARYNGOLOGY, FACULTY OF MEDICINE, CHULALONGKORN UNIVERSITY, BANGKOK, THAILAND)

10:30~10:50

### HPV RELATED CANCER - ORAL CAVITY CANCER CAN BE RELATED?

DEPARTMENT OF OTOLARYNGOLOGY, COLLEGE OF MEDICINE, CHUNG-ANG UNIVERSITY

SEI YOUNG LEE

인간인유두종바이러스 (Human Papilloma Virus, HPV)는 1970년대 zur Hausen에 의해 최초로 인간에서 암을 유발할 수 있다는 것이 밝혀진 이후, 다양한 부위의 암에서 원인인자로 확인되었으며, 두경부에서도 전체 암 환자의 약 20~25%가 HPV에 의해 암이 발생하는 것으로 확인되어 현재 HPV는 두경부암의 중요한 원인 인자 중 하나로 여겨지고 있다. HPV에 의해 발생하는 두경부암은 전 통적인 두경부암과 구별되는 여러 특징이 있는데, 이중 하나가 호발부위가 있다는 것 (site specific) 이다. 즉, 두경부의 경우 전체 HPV(+) 두경부암 중 약 80%가 구인두에서 발생하며, 구인두암의 약 60~80%가 HPV에 의해 발생하는 것으로 알려져 있다. 구인두 다음으로 호발하는 곳이 구강이며 이 중 구강설이 가장 높은 빈도를 차지한다. 하지만 전체 구강암 환자 중 약 5~15% 정도만이 HPV에 의해 발생하는 것으로 알려져 있어 인접부위인 구인두에 비해 HPV의 역할은 매우 낮은 수준이다. 이러한 부위 별 차이가 왜 발생하는 지에 대해 명확히 규명된 바는 없으나 조직학적 특성에 의한 것으로 추 정되고 있으며, 특히 HPV가 오래동안 유지할 수 있는 조직학적 구조의 유무가 HPV에 의한 암 발생률을 좌우하는 것으로 알려져 있다. 따라서 아직까지 구강암에서 HPV 역할에 대해서는 논란이 많은 실 정이며, 특히 과거의 많은 연구에서 구강과

구인두를 혼용하였다는 점과 사용되었던 HPV 검출 방법의 민감도와 특이도가 매우 다양하였다는 점으로 인해 구강암에서 HPV의 정확한 유병율을 확인하는데 어려움이 있었으며, 이는 구강암에서의 HPV의 역할을 규명하는데 장애가 되고 있다. 본 연제에서는 구강암에서 HPV의 유병율이 과거와 현재 어떻게 차이가 있는지 확인해 보고, 구강과 구인두에서 발생 하는 HPV(+) 암에 있어 유사점과 차이점을 살펴 보고자 하며, 왜 구인두암과 구강암에서 HPV(+) 암 의 발생 빈도에 차이가 있는지, HPV(+) 구강암과 HPV(-) 구강암에는 어떠한 차이가 있는지 등을 살펴보고자 한다.

10:50~11:10

#### CHALLENGES OF THE ORAL CANCER BURDEN IN ASIA

DEPARTMENT OF OTORHINOLARYNGOLOGY, KHON KAEN UNIVERSITY, KHON KAN, THAILAND  
PATRAVOOT VATANASAPT

11:10~11:30

#### RESECTION MARGIN CONTROL

SEOUL NATIONAL UNIVERSITY BORAMAE MEDICAL CENTER  
DOH YOUNG LEE

11:30~11:50

#### SUBLINGUAL LYMPH NODE - IMPORTANCE AND MANAGEMENT

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, THE CATHOLIC UNIVERSITY OF KOREA, COLLEGE OF MEDICINE  
YOUNG HOON JOO

Understanding the lymphatic system's anatomy is of paramount significance in surgical oncology. Cancers frequently spread through the network of lymphatic channels that transport tumor cells to the regional lymph nodes. The presence of regional lymph node metastasis is an important predictive factor that influences both, treatment and prognosis. Sublingual lymph node metastasis of early stage squamous cell carcinoma of the oral cavity is seldom reported. The sublingual lymph nodes are inconstant nodes located within the fascial/intermuscular spaces of the floor of the mouth. Oral tongue squamous cell carcinoma has been reported to recur and metastasize in lingual lymph nodes with poor prognosis. Lingual lymph nodes are not currently included in basic tongue squamous cell carcinoma surgery. Lymphatic tissue in the floor of mouth, which intervenes between the tongue and neck, will be left behind by a primary tumor resection with discontinuous neck dissection. A combination with neck dissection allows elimination of the posterior extents of the mouth floor lymph node-bearing fat compartments. Metastasis to the lingual lymph node may cause a recurrence of oral cancer in the neck, since conventional neck dissection cannot remove this node even in the case of en bloc resection of the primary tumor and the neck. When CT, MRI, or intra-operative palpation findings lead to a suspicion of metastasis to the lingual lymph node, the area of neck dissection should be extended to include this node.

11:50~12:10

#### PROGNOSTIC MARKERS IN ORAL CAVITY CANCER PATIENTS

DEPARTMENT OF OTOLARYNGOLOGY, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA  
JONG-LYEL ROH

Cancers of the oral cavity is the eighth most common type of cancer worldwide corresponding to 3.8% of all cancer cases. The incidence of oral cavity and oropharynx is continuously rising in variations by subsites across world regions and countries. There is a need for prognostic approaches to optimally apply treatment interventions and accurately predict outcomes. Prognostic factors required for oral cavity cancers have included tumor size, depth of invasion, resection margins, worst pattern of invasion (tumor budding or satellite spreading), perineural or lymphovascular invasion, overall health status (comorbidity), and lifestyle factors (tobacco and alcohol use). In addition, molecular biomarkers had been suggested to predict post-treatment outcomes and survivals. A recent systematic review identified, evaluated, and summarized the evidence of biomarkers related to oral cavity cancer. This study suggested 41 biomarkers from the analyses using the REMARK, QuickGo tool, and SciCurve trends, which mostly evaluated by immunohistochemistry. We have also reported several biomarkers in patients with oral cavity cancer: IL-4R and IL-13R (Eur J Cancer 2015), glycosylceramide synthase and P-glycoproteins (Int J Clin Oncol 2016), glutathione peroxidase 1 (J Cancer Res Clin Oncol 2017), and cystin-glutamate transporter (xCT) and CD44 (Head Neck 2018). We have also reported that the quantitative measurements of functional volumetric parameters using 18F-FDG PET/CT might have prognostic role (Eur J Nucl Med Mol Imaging 2014). Further establishment and validation of biomarkers related to oral cavity cancers are urgent to improve treatment interventions and prognostic predictions.

12:10~12:30

### MANAGEMENT OF ORAL CANCER IN CHULALONGKORN UNIVERSITY

DEPARTMENT OF OTOLARYNGOLOGY, FACULTY OF

MEDICINE, CHULALONGKORN UNIVERSITY, BANGKOK, THAILAND

NAPADON TANGJATURONRASME

## 대한소아비인후학회 Symposium 1

Allergic rhinitis

10:30~11:30 • 세미나실1

Chairperson(s) : 정유삼(울산의대)

### 1. LOCAL IMMUNE RESPONSE IN AR (CHILDREN VS. ADULTS)

SEOK HYUN CHO (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HANYANG UNIVERSITY COLLEGE OF MEDICINE)

### 2. PEDIATRIC IMMUNOTHERAPY IN PEDIATRIC AR

SEON-TAE KIM (DEPARTMENT OF OTORHINOLARYNGOLOGY GACHON UNIVERSITY, SCHOOL OF MEDICINE, GIL MEDICAL CENTER)

### 3. RECENT UPDATE IN PEDIATRIC ALLERGIC RHINITIS

JUNG HO BAE (DEPARTMENT OF OTORHINOLARYNGOLOGY, EWSA UNIVERSITY COLLEGE OF MEDICINE)

10:30~10:50

### LOCAL IMMUNE RESPONSE IN AR (CHILDREN VS. ADULTS)

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HANYANG UNIVERSITY COLLEGE OF MEDICINE

SEOK HYUN CHO

만성비염은 크게 알레르기비염(allergic rhinitis, AR)과 비알레르기비염(nonallergic rhinitis, NAR)으로 구분되는데, 이를 위하여 과거력 및 임상 증상에 대한 병력 청취와 함께 피부단자검사 혹은 혈액에서 항원 특이적 IgE (specific IgE, sIgE)에 대한 검사가 필수적이다. 최근 면역학적인 진단기법의 발달과 더불어 천식에서 많은 endotype이 밝혀지고 있는 것과 마찬가지로 비염에서도 기존에 알려졌던 전통적인 분류 외에 좀 더 정확한 원인을 알고자 하는 노력들이 있었고, 그 결과물 중의 하나로 최근 국소알레르기비염(local allergic rhinitis, LAR)의 개념이 제시되고 있다. 국소알레르기비염의 존재는 1975년 Huggins와 Brostoff가 피부단자검사 음성인 환자의 비즙에서 sIgE가 증가하는 현상을 처음 보고한 이후로 비알레르기비염 환자에서 국소알레르기비염을 증명하려는 노력이 있어 왔다. 국소알레르기비염은 항원의 전신적 감각에 대한 증거가 없이 국소조직에서 T-helper type 2 (Th2) 반응에 합당한 결과를 보일 때 정의되는 것으로 아직까지 그 정확한 기전과 예후 등에 대하여는 많이 밝혀져 있지 못한 상태이다. 지금까지 제시된 국소알레르기비염의 진단 기준으로는 1) 전신 항원 특이적 IgE 음성, 2) 항원의 자연적 노출에 의한 국소 항원 특이적 IgE 양성 혹은 Th2 반응, 3) 항원 유발검사서 양성 소견과 비즙에서 증가하는 항원 특이적 IgE, tryptase, ECP 등이 있다. Rondon 등은 피부단자검사와 혈액 항원 특이적 IgE 전부 음성인 환자에서 1) 비유발반응검사서 양성 소견, 2) 비강 sIgE의 증가 소견 중 한 개 이상을 만족한 경우에 국소알레르기비염으로 진단하는 것으로 보고하였다. 비유발반응검사는 먼저 비과민반응성(nasal hyperreactivity)을 감별하기 위하여 생리식염수에 대한 반응이 없는지 확인한다. 프로토콜은 검사 전, 자극 후 15분, 1-2시간, 그리고 24시간까지 관찰하는데, 증상에 대한 VAS와 음향비강통기도검사(acoustic rhinometry)에서 비강체적(2-6 cm)의 변화를 관찰한다. 30% 이상 VAS점수가 증가하는 경우와 30% 이상 비강체적이 감소하는 경우 모두를 만족할 때 비유발반응검사서 양성으로 판정한다. 그러나 과연 비유발반응검사가 국소 특이적 IgE의 존재여부를 잘 반영하는지에 대한 추가적 연구가 필요하다. 본 발표에서는 국소 알레르기 비염에 대한 선행 연구 결과를 정리해보고, 저자의 이에 대한 연구경험을

토대로 소아와 성인에서 국소 알레르기 비염에 대해 조망해 보고자 한다.

10:50~11:10

### PEDIATRIC IMMUNOTHERAPY IN PEDIATRIC AR

DEPARTMENT OF OTORHINOLARYNGOLOGY GACHON UNIVERSITY, SCHOOL OF MEDICINE, GIL MEDICAL CENTER  
SEON-TAE KIM

Sublingual immunotherapy (SLIT) was recently developed and is widely used in Europe. SLIT has been reported to be well-tolerated and effective for the treatment of allergic rhinitis (AR) and asthma in children, adults, and elderly patients. Several systemic reviews indicate that the use of SLIT in patients with AR sensitive to house dust mites (HDMs) yielded significantly lower symptom scores and better clinical outcomes. Recent studies support the use of SLIT as the first-choice treatment for AR and asthma compared to medication and subcutaneous immunotherapy (SCIT). Nevertheless, conflicting results on the efficacy of SLIT in patients have appeared, and no consensus has yet been formed in terms of the basic treatment parameters (e.g., dose and duration) for SLIT. The optimal dose and duration of SLIT remain unclear, because the density and quality of HDM allergens vary according to the manufacturer. Additional investigations are essential in order to recommend HDM-SLIT as a primary treatment modality for AR patients sensitive to HDMs.

11:10~11:30

### RECENT UPDATE IN PEDIATRIC ALLERGIC RHINITIS

DEPARTMENT OF OTORHINOLARYNGOLOGY, EWAH UNIVERSITY COLLEGE OF MEDICINE

## JUNG HO BAE

Allergic rhinitis presents both challenges and opportunities for the pediatric patient, caregiver, and health care professional. AR is a common chronic disease affecting 20–30% of children. AR is an inflammatory disorder of the nasal mucosa marked by nasal congestion, rhinorrhea, and itching, often accompanied by sneezing and conjunctival inflammation. Childhood AR is associated with a 3-fold increase in risk for asthma at an older age. The aim of this session is to compare the AR characteristics, different treatment strategies between children and adults. And review the newer treatment modalities of pediatric AR. Proper diagnosis facilitates patient/caregiver education and permits consideration of multiple therapeutic modalities tailored to the individual patient. AR management in a specific child is age dependent and influenced by the severity and frequency of the symptoms and the presence of any concurrent conditions. Current strategies permit symptomatic control and improved quality of life for most patients.

## 대한소아비인후학회 Symposium 2

Congenital cholesteatoma in pediatric otology

11:30~12:30 • 세미나실1  
Chairperson(s) : 김영호(서울의대)

### 1. INCIDENCE, ETIOLOGY AND PATHOGENESIS OF CHOLESTEATOMA IN CHILDREN

JEONG-HOON OH (DEPARTMENT OF OTORHINOLARYNGOLOGY, BUCHEON ST MARYS HOSPITAL, THE CATHOLIC UNIVERSITY OF KOREA)

### 2. SURGERY FOR CONGENITAL AND ACQUIRED CHOLESTEATOMA IN CHILDREN

IM, GI JUNG (DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY COLLEGE OF MEDICINE)

### 3. ENDOSCOPIC MANAGEMENT OF PEDIATRIC CHOLESTEATOMA

IL JOON MOON (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER)

11:30~11:50

### INCIDENCE, ETIOLOGY AND PATHOGENESIS OF CHOLESTEATOMA IN CHILDREN

DEPARTMENT OF OTORHINOLARYNGOLOGY, BUCHEON ST MARYS HOSPITAL, THE CATHOLIC UNIVERSITY OF KOREA  
JEONG-HOON OH

Although cholesteatoma was first described in 1683, its etiology and pathogenesis remain unexplained. In children, there are two forms: acquired cholesteatoma, resembling the adult form, and congenital cholesteatoma. The acquired form has become less frequent in recent years, thanks to progress in the treatment of childhood otitic pathology. Recent figures testify to a fall in the incidence of both adult and childhood acquired cholesteatoma: in 1925, the rate of cholesteatoma in the under-16's was one in three; it is now much less frequent, but incidence in the early 2000s was still three per 100,000 (compared to nine per 100,000 in adults). The incidence of congenital cholesteatoma, on the contrary, seems to be on the rise, at 0.12 per 100,000 children. Some 1 to 3% of cases of childhood cholesteatoma, and 1 to 5% of cholesteatoma are congenital. The relative increase is due to the fall in the number of cases of acquired cholesteatoma and an increase in the diagnosis of congenital cholesteatoma. Increasing diagnosis of congenital cholesteatoma is mainly due to the improvements in

information to health care professionals and in diagnostic tools such as oto-endoscopy. Diagnosis is clinical, but CT and MR imaging is indispensable for preoperative assessment and postoperative follow-up. New delayed gadolinium-enhanced T1-weighted and diffusion-weighted MRI sequences have recently been developed and provide more precise radiological diagnosis. In this presentation, the incidence, etiology and pathogenesis of pediatric cholesteatoma including congenital and acquired will be reviewed.

11:50~12:10

## **SURGERY FOR CONGENITAL AND ACQUIRED CHOLESTEATOMA IN CHILDREN**

DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY COLLEGE OF MEDICINE

GI JUNG IM

Congenital cholesteatomas have been considered a rare disorder. However, a review of the literature reveals an incidence ranging from 4 to 24%, and these values are probably underestimated. Incidence of Congenital cholesteatomas (CCs) have been considered a rare disorder. However, a review of the literature reveals an incidence ranging from 4 to 24%, and these values are probably underestimated. Incidence of congenital cholesteatoma of the middle ear seems to be increasing due to recent developments in diagnostic skill including the use of endoscopy. Congenital cholesteatomas have been defined as evidencing no prior history of otorrhea, tympanic perforation, or previous otologic procedures; and a pearly white mass medial to the tympanic membrane. The most common sites of presentation are the anterior-superior and posterior-superior quadrants of the tympanic membrane. Conductive hearing loss is the most common presenting symptom. Preoperative temporal bone computed tomography (TBCT) should be considered to assist in

preoperative planning. In the analysis of the TBTC, the continuity of ossicles should be evaluated to find potential damages including IS joint, stapes, oval window, and any ossicle erosion. Facial nerve canal dehiscence and the erosion of tegmen must be evaluated. The extent of CCs should be evaluated especially in attic area. Early treatment decreases the extent of the disease and reduces the risk of recidivism and complications. Management of this disease is complete surgical removal, and early surgical intervention is advocated because CCs grow gradually in close relation to a patient's age. Most patients with stage I and II CCs were completely cured by trans-tympanic surgery, and complication and recurrence rates increased according to the extent of disease. To obtain excellent view of the surgery for CCs, surgeons do not need to avoid post-aural approach, and even mastoidectomy approach. Recent surgical focus is on the complete removal of CCs especially from attic area and ant/post tympanic isthmus. Although endoscopic examination can be additional assisted method to find residual cholesteatoma, delicate surgical removal using microscope and dissection using surgical gauze through ant/post tympanic isthmus should be the main surgical method for complete removal of CCs.

12:10~12:30

## **ENDOSCOPIC MANAGEMENT OF PEDIATRIC CHOLESTEATOMA**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER

IL JOON MOON

Advances in operative endoscopes have enabled transcanal endoscopic ear surgery (TEES) to treat middle ear disease, and the role of the endoscope has evolved in its application in managing cholesteatoma, par-



ticularly in the pediatric population. The traditional operating microscope provides an excellent-quality magnified image in a straight line, but the surgeon's field of view is limited to the narrowest segment of the ear canal; the endoscope allows a wider angle of view. Among pediatric congenital cholesteatomas, stages I, II, and III are confined to the middle ear and can be removed by endoscopic approach alone. In this talk, experience with using TEES for congenital cholesteatoma removal and clinical efficacy in a pediatric population will be discussed.

## 대한소아비인후학회 Symposium 3

Practical tips and pitfalls on pediatric surgery

13:30~14:30 • 세미나실1  
Chairperson(s) : 김철호(아주의대)

### 1. SURGERY OF PEDIATRIC HEAD AND NECK MALIGNANCY

JUN-HEE PARK (CHOSUN UNIVERSITY SCHOOL OF MEDICINE)

### 2. SURGERY OF PEDIATRIC SALIVARY GLAND DISEASE

JEONG KYU KIM (DEPARTMENT OF OTORHINOLARYNGOLOGY, CATHOLIC UNIVERSITY OF DAEGU SCHOOL OF MEDICINE)

### 3. SURGERY OF PEDIATRIC AIRWAY DISEASE

SEONG KEUN KWON (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY SCHOOL OF MEDICINE)

13:30~13:50

### SURGERY OF PEDIATRIC HEAD AND NECK MALIGNANCY

CHOSUN UNIVERSITY SCHOOL OF MEDICINE  
JUN-HEE PARK

13:50~14:10

### SURGERY OF PEDIATRIC SALIVARY GLAND DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY, CATHOLIC UNIVERSITY OF DAEGU SCHOOL OF MEDICINE  
JEONG KYU KIM

Common diseases of salivary gland in children are virus related inflammation, and are rarely treated by surgery. Salivary gland diseases in children are usually included in the pathology of the adult. However, it is essential to know that pediatric salivary gland diseases differ in their incidence and sometimes in their symptoms. Clinical diagnostics and especially the surgical treatment are influenced by a stringent indications and a less invasive strategy. This lecture would highlight surgeries for commonly encountered pediatric salivary gland diseases including salivary gland stones, ranula, sialorrhea, and juvenile recurrent parotitis.

13:30~14:30

### SURGERY OF PEDIATRIC AIRWAY DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY SCHOOL OF MEDICINE  
SEONG KEUN KWON

Pediatric airway disease must be treated according to

the causes, locations, and severity of the disease. Prior to definite surgery, evaluating the entire airway, especially in pediatric population, is mandatory and a key to successful establishment of safe airway. In this talk, experience with novel airway evaluation technique for pediatric airway disease (STRIVE-Hi) and surgical management (endoscopic and open) of the airway disease will be discussed.

## 대한청각학회 Symposium

Most advances in hearing aid techniques

13:30~15:30 • 그랜드홀1

Chairperson(s) : 이준호(서울의대)

### 1. DIAGNOSIS OF COCHLEAR DEAD REGIONS AND THE STRATEGIES TO OVERCOME THEM

HYUNJOON SHIM (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, EULJI UNIVERSITY SCHOOL OF MEDICINE, EULJI MEDICAL CENTER, SEOUL)

### 2. 소음 환경하의 보청기 청취향상을 위한 전략

MOO KYUN PARK (DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY HOSPITAL)

### 3. WIRELESS TECHNOLOGIES의 발전과 가능성

KYU-YUP LEE (DEPARTMENT OF OTORHINOLARYNGOLOGY, SCHOOL OF MEDICINE, KYUNGPOOK NATIONAL UNIVERSITY)

### 4. TELEAUDIOLOGY와 보청기 적합

JINSOOK KIM (DIVISION OF SPEECH PATHOLOGY AND AUDIOLOGY)

### 5. 보청기와 인공지능의 미래

JAE-JIN SONG (SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL)

13:30~13:55

### DIAGNOSIS OF COCHLEAR DEAD REGIONS AND THE STRATEGIES TO OVERCOME THEM

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, EULJI UNIVERSITY SCHOOL OF MEDICINE, EULJI MEDICAL CENTER, SEOUL

HYUNJOON SHIM

Cochlear dead region (DR) defined as “a region of the cochlea where inner hair cells and/or neurons are completely non-functional (Moore 2001, 2004).” Because of no transmission of information about basilar-membrane vibration at that place, amplification of DRs using hearing aids may not be beneficial. Several studies suggested providing no gain (or reduced gain) > 1.7 times the estimated edge frequency to reduce the chance of acoustic feedback and to concentrate efforts of amplification over the useful frequency range (Vickers et al., 2001; Baer et al. 2002). Psychophysical tuning curves (PTCs) are considered the “gold standard” for diagnosing DRs and give the information of the edge frequency of DR, but the measuring PTCs is a time consuming and impractical for clinical practice. The alternative method to detect DRs is the threshold-equalizing noise (TEN) test (HL version; Moore 2004). In this test, a definite DR was indicated if the masked threshold was  $\geq 10$  dB above the TEN level and  $\geq 10$  dB above the absolute threshold. However, TEN tests cannot be performed over 4 kHz and can give only a rough indication of the edge frequency of a DR. Because, the maximum intensity of TEN is 90 dB HL, at the frequency with profound hearing loss (> 90 dB) the results is considered inconclusive. To assist listeners with cochlear DR at high frequency, frequency lowering algorithms have been developed (e.g., non-linear frequency compression (Phonak and Unitron) and frequency transposition (Widex) techniques). Several literature reported positive effects on consonant identification with both techniques, how-

ever many others did not showed benefit over conventional processing. Especially the listeners with steeply-sloping high-frequency hearing losses are difficult to hear the compressed or transposed speech, because of their narrow bandwidth to take the speech information from DRs. Moreover, /s-f/ discrimination is most beneficial to plural recognition through the frequency lowering, but the value of this discrimination is lower in Korean. Because excessive or improper cut-off frequency may distorted the speech information, careful selection of objects and enough adaptive period for frequency lowering should be needed.

13:55~14:20

### 소음 환경하의 보청기 청취향상을 위한 전략

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL  
NATIONAL UNIVERSITY HOSPITAL

MOO KYUN PARK

보청기의 기술은 디지털 신호처리(Digital signal processing)이 도입되면서 다양한 신호 처리가 가능하게 되면서 급격히 발전하였다. 현재 대부분의 보청기는 디지털화 되었으며 인공지능 및 뇌과학 연구를 통한 새로운 IT 기술의 소개와 개발에 따라 소음환경하의 청취향상을 위해 다양한 방식의 신호처리 기술을 시도 되어지고 있다. 소음 환경하의 청취향상을 위해 가장 기본적으로 적용된 기술은 소음 감소 알고리즘과 방향성 마이크로폰이다. 소음 감소 알고리즘으로 기본적으로 소음과 어음의 주파수적 위치, amplitude fluctuation과 이들의 시간적 특성을 비교 하여 소음은 제거하고 어음의 소리는 유지하는 것이다. 하지만 소음제거는 어음의 왜곡 및 Gain의 감소를 초래 할 수 있어 이를 개선하기 위한 다양한 시도가 있어왔다. 소음환경하에서 청취향상을 위한 중요한 개념 중 다른 하나는 지향성 마이크로폰이다. 이는 공간적으로 소음과 어음을 구별하게 도와 주어 신호대 잡음비가 3-5dB 향상되는 것으로 알려져 있다. 최근 보청기들은 대부분 지향성 마이크로폰을 가지고 있어 주변 환경에 따라 지향성 및 범향

성 마이크로폰을 사용 하게 된다. 그러나 이러한 이득은 화자와의 거리 및 음향반향(Reverberation) 등에 따라 달라지며 사용자의 나이에 따라 다양한 반응을 보인다. Wireless technology는 화자나 음원의 소리를 소음의 간섭을 피해 보청기로 전달하게 해주는데 도움이 된다. FM기술은 학교나 공연장등에서 보청기 사용자에게 소음이 없는 소리를 제공해 줄 수 있다. 무선기술의 발달로 보청기는 스마트폰과 TV, 렉서를 비롯한 다양한 기기와의 편리하게 연결이 되며 전력 소모 또한 개선되고 있다. 최근 Bottom up process의 개선으로는 청취 향상의 한계가 있음을 알았으며 다양한 방식의 Top down process 개선법이 소개되고 있다. 가령, 여러 명의 화자가 이야기를 하는 Cocktail party 환경의 경우 기존 보청기 기술의 경우 다양한 화자의 소리를 소음으로 파악하기는 어렵다. 이를 극복하기 위해 보청기의 EEG 혹은 EOG를 통해 환자가 듣기 원하는 소리와 방향을 탐지하고 이를 소음과 구별하여 증폭할 수 있다. 인공지능을 활용하여 소음 감소 알고리즘과 방향성 마이크로폰을 자동으로 조정하고 최적화 할 수 있다.

14:20~14:45

### WIRELESS TECHNOLOGIES의 발전과 가능성

DEPARTMENT OF OTORHINOLARYNGOLOGY, SCHOOL OF  
MEDICINE, KYUNGPOOK NATIONAL UNIVERSITY

KYU-YUP LEE

최근 사회는 휴대폰, TV, 음향기기 등 많은 기기들이 생활에 필수품으로 자리 잡고 있다. 난청을 가진 환자들은 정도의 차이는 있으나 이런 현대 생활에 필요한 기기들의 사용이 힘들게 되어 사람과의 의사소통의 불편감과 더불어 사회적으로 소외 되는 결과를 초래하게 된다. 이런 문제를 해결할 수 있는 좋은 방법이 Wireless technologies의 발달은 휴대폰과의 효과적인 연결로 서로 자유로운 원거리 의사소통이 가능하게 되었고 TV나 음향기기와의 연결도 쉽게되어 폭넓은 문화생활을 가능하게 한다. 지금까지는 보청기의 작은 크기로 인해 좀더 효과적인 Wireless technology를 적용하는데 한계가 있었으나 좀더 향상된 무선통신 프로토콜의 발

달과 IT 기술의 발달로 그 한계를 극복하고 있으며 배터리 사용시간의 문제도 해결되고 있다. 여기에서 최근 Wireless technologies를 소개하고 향후 그 가능성에 대해 발표하고자 한다.

14:45~15:10

#### TELEAUDIOLOGY와 보청기 적합

DIVISION OF SPEECH PATHOLOGY AND AUDIOLOGY

JINSOOK KIM

15:10~15:30

#### 보청기와 인공지능의 미래

SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

JAE-JIN SONG

## 대한비과학회 해외연자 특강

Biologic therapy for nasal polyps

13:30~14:00 • 그랜드홀2

Chairperson(s) : 김성완(경희의대)

13:30~14:00

#### BIOLOGIC THERAPY FOR NASAL POLYPS

DIVISION OF ALLERGY-IMMUNOLOGY, DEPARTMENT OF INTERNAL MEDICINE, UNIVERSITY OF SOUTH FLORIDA COLLEGE OF MEDICINE

SEONG HO CHO

Chronic rhinosinusitis (CRS) is a heterogeneous in-

flammatory disease with various underlying pathophysiologic mechanisms which translate to endotypes, in contrast to clinical phenotypes or histological subtypes. Identifying endotypes can assist to predict disease prognosis and select subjects suitable for a specific therapy. Therefore, with the recent approval of dupilumab on nasal polyp indication by the US FDA and advancement of other biologicals in CRS clinical trials, endotyping can be a breakthrough in treating recalcitrant CRS. CRS is caused by dysregulated immunologic responses to external stimuli, which induce various inflammatory mediators from inflammatory cells including innate lymphoid cells (ILCs), lymphocytes, eosinophils, mast cells as well as epithelial cells. TSLP, IL-25 and IL-33, which are mainly secreted by the epithelial cells in response to external stimuli, act on type 2 ILCs and Th2 cells, inducing IL-4, IL-5, and IL-13. Local IgE production is also a signature event in nasal polyps. These inflammatory mediators are novel potential therapeutic targets for recalcitrant CRS. This presentation will review recent publications regarding endotypes and endotype-based therapeutic strategies in CRS, including the recent dupilumab Phase III clinical trials.

## 대한비과학회 Symposium

Advanced endoscopic surgery in rhinology as a surgical option for PNS tumors

14:00~15:30 • 그랜드홀2

Chairperson(s) : 조진희(가톨릭의대)

#### 1. TRANSNASAL ENDOSCOPIC APPROACH FOR SINONASAL INVERTED PAPILLOMA

HYUN JIK KIM (DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE)

## 2. ENDOSCOPIC TRANSPTERYGOID APPROACH FOR ANGIOFIBROMA

SUNG WON KIM (DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA)

## 3. ENDOSCOPIC SURGERY FOR FIBRO-OSSEOUS TUMORS: WHEN & HOW

KYU-SUP CHO (DEPARTMENT OF OTORHINOLARYNGOLOGY, PUSAN NATIONAL UNIVERSITY HOSPITAL)

## 4. ENDOSCOPIC SURGERY FOR NASOPHARYNGEAL TUMORS: APPROACH & SURGICAL TECHNIQUES

TAEBIN WON (DEPARTMENT OF OTORHINOLARYNGOLOGY-HNS, SEOUL NATIONAL UNIVERSITY SCHOOL OF MEDICINE, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL)

## 5. ENDOSCOPIC SURGERY FOR MENINGOENCEPHALOCELE

SANG DUK HONG (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER)

## 6. THE ROLE OF ENDOSCOPIC RESECTION FOR PNS MALIGNANT TUMORS

SANG-CHUL LIM (DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL, CHONNAM NATIONAL UNIVERSITY HOSPITAL)

Because of the aggressive nature of tumor growth and malignant transformation potential, inverted papilloma should not be managed as a totally benign tumor. Definitely inverted papilloma treatment is surgical and must aim at being radical. The radical external approach, lateral rhinotomy or midfacial degloving with en bloc resection of the lateral nasal wall, still remains the golden standard for inverted papilloma surgery due to the lowest rate of recurrence. The endoscopic approach to resection of inverted papilloma is attributable to the improved visualization of the tumor and anatomy, advanced surgical instrumentation and application of new techniques. The recurrence rate is higher than that of radical extranasal excision that reflects certain limitations associated with the endoscopic approach but it compares favorably with other endoscopic series. It is important to note that endoscopic tumor surgery is technically demanding and associated with potential complications. To ensure a low recurrence rate and avoid complications, endoscopic tumor resection should be performed by surgeons who are experienced in the techniques of endoscopic sinus surgery. The endoscopic approach alone can be applied to tumors affecting the turbinates, ethmoid sinuses, and limited involvement of the maxillary, frontal and sphenoid sinuses. More extensive disease requires extranasal approaches which may be combined with the endoscopic approach at any time. The assessment of endoscopic resectability depends on preoperative endoscopic examination, CT imaging and more importantly intraoperative assessment including tumor visualization and accessibility. The role of endoscopy in the follow-up of these patients is important. The excellent visualization of the postoperative cavity enables early detection of residual disease. Furthermore minor revision surgery can be performed under local anesthesia as an outpatient procedure.

14:00~14:15

## TRANSNASAL ENDOSCOPIC APPROACH FOR SINONASAL INVERTED PAPILLOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

HYUN JIK KIM

14:15~14:30

## ENDOSCOPIC TRANSPTERYGOID APPROACH FOR ANGIOFIBROMA

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA

SUNG WON KIM

Juvenile angiofibroma is well-vascularized benign neoplasm typically occurring in adolescent males and with clinical symptoms of epistaxis and nasal obstruction. Although pathologically benign, they often behave in a locally invasive manner. Surgical resection is considered first-line therapy and classic resection involved an open approach. But currently, angiofibroma can be resected endoscopically. Preoperative embolization is generally advocated to reduce intraoperative bleeding. Most common feeding vessels include the distal branches of the maxillary artery, ascending pharyngeal artery, etc. It should be performed within 24 hours of surgery, because prolonged duration can lead to the development of collateral blood supply and revascularization of the tumor. To access the tumor boundaries, a wide maxillary antrostomy, ethmoidectomy and sphenoidotomy should be performed. With large tumor, a medial maxillectomy may be necessary. Thus, early wide access is main key. Next, the operator resects the bony posterior maxillary wall with either a high-speed drill or Kerrison rongeurs to expose the sphenopalatine and maxillary artery. After exposing the feeding artery, it is ligated with endoscopic clip applier. After that, operator dissects the posterior nasopharyngeal component to free from the surrounding tissues and dissects the intranasal portion of the tumor. If the tumor is attached or invading the posterior septum, then a posterior septectomy may be required to ensure complete resection. And it is necessary to dissect along the subperiosteal plane for free

margin from the lateral nasal wall. Lastly, remove the tumor either transnasally or transorally depending on its size, and cover the surgical defect (exposed fat or bone) with a free mucosal graft or biocompatible allograft to promote healing. In this presentation, a case of the recurrent angiofibroma operated by transpterygoid approach would be presented.

14:30~14:45

## ENDOSCOPIC SURGERY FOR FIBRO-OSSEOUS TUMORS: WHEN & HOW

DEPARTMENT OF OTORHINOLARYNGOLOGY, PUSAN NATIONAL UNIVERSITY HOSPITAL

KYU-SUP CHO

The spectrum of benign bone-containing lesions of the paranasal sinuses shares the common feature of replacement of normal bone by fibroblasts and a variably mineralized collagen matrix. Definitive diagnosis incorporates clinical history, radiologic appearance, and histopathology. Among the more commonly encountered benign fibro-osseous lesions along this spectrum are fibrous dysplasia (with the least bone), ossifying fibroma, and osteoma (with the most bone). Osteomas are dense, well-delineated radiopaque lesions that histologically resemble normal compact cancellous lamellar bone that contains variable amounts of marrow. They require surgical intervention if they produce pain and sinusitis associated with blocked drainage of a sinus, typically the frontal sinus or the ethmoid sinus. The classical radiologic finding is a dense, well-delineated radiopaque lesion. Fibrous dysplasia is an osseous proliferation of the mandible and maxilla characterized by excessive production of immature bone. It usually presents in adolescent and young women as an asymmetric, painless swelling, but may occur in older adults. The CT appearance of fibrous dysplasia can vary, but the typical ground glass

appearance is most common and highly suggestive of the diagnosis. Surgery is indicated for disfiguring fibrous dysplasia, such as can occur in the maxilla or to alleviate compression causing neurologic deficit, such as visual loss. Ossifying fibromas are radiologically and surgically well-demarcated osseous lesions, distinct from fibrous dysplasia. Although more common in the mandible and maxilla, they can occur in the orbit, paranasal sinuses, and anterior skull base. Their radiologic appearance depends in large part on the maturity of the lesion and can range from radiolucent to radiopaque. Unlike for fibrous dysplasia, it is best to resect ossifying fibromas completely because their growth rate can be unpredictable. As the lesions are generally well demarcated, this can be done with narrow margins (similar to curettage in the mandible) unless clinically aggressive behavior or recurrence has been noted.

14:45~15:00

### ENDOSCOPIC SURGERY FOR NASOPHARYNGEAL TUMORS: APPROACH & SURGICAL TECHNIQUES

DEPARTMENT OF OTORHINOLARYNGOLOGY-HNS, SEOUL NATIONAL UNIVERSITY SCHOOL OF MEDICINE, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

TAEBIN WON

Tumors in the nasopharynx poses significant challenges for surgical access. Conventional open approaches which includes the transpalatal, maxillary swing, and trans-mandibular-pterygoid approaches require the displacement of surrounding bony structures to allow adequate access. Despite the invasiveness and sequela of these open approaches, exposure often remains suboptimal. Recent advances in endoscopic endonasal approaches (EEA) for the skull base have expanded to include the nasopharynx. This lecture will focus on the endoscopic approach to the nasopharynx where

pearls and nuances will be addressed through clinical cases.

15:00~15:15

### ENDOSCOPIC SURGERY FOR MENINGOENCEPHALOCELE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER

SANG DUK HONG

A meningoencephalocele is a herniation of meninges and brain out of the cranial fossa through a bony defect. Cerebrospinal fluid (CSF) leakage may occur. The cause of defect may be traumatic, iatrogenic, or spontaneous. Spontaneous CSF leaks due to the meningoencephalocele is the problematic situations because it is hard to anticipate and hard to treat. Spontaneous CSF leaks from meningoencephalocele are often associated with elevated intracranial pressure (ICP). Therefore, preoperative evaluation of ICP and postoperative management of elevated ICP is essential to treat. meningoencephalocele is also associated with the female gender and obesity. In many cases, spontaneous CSF leaks are the most difficult to treat. small and slow leaks are hard to find out. High resolution CT(HRCT), CT cisternography and MR cisternography can be used. However, these methods have relatively low sensitivity for small leaks. T2-weighted MRI could be used, but it had high false-positive rate. For spontaneous CSF leaks from meningoencephalocele, I usually use the intraoperative intrathecal fluorescein because of exact localization of leak point and detection of multiple defect. This dye can help the confirmation of reconstruction. Endoscopic endonasal approach for meningoencephalocele is safe and effective treatment modality. The defect sites were usually on cribriform plate, forvea ethmoidalis or lateral re-

cess of sphenoid sinus. Depending on defect sites, we have to make proper corridors such as transcribriiform or transpterygoid approach. After approaching to the lesions, the defect must be circumferentially visualized. If a meningoencephalocele is present, it should be reduced or cauterized flush with the skull base. And, skull base should be circumferentially demucosalized around the defect site. The multilayer reconstruction with/without rigid buttress is needed. And then, it is critical that the mucosal overlay graft or flap lie flush with the skullbase.

15:15~15:30

### THE ROLE OF ENDOSCOPIC RESECTION FOR PNS MALIGNANT TUMORS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL, CHONNAM NATIONAL UNIVERSITY HOSPITAL  
SANG-CHUL LIM

Paranasal sinus malignancies are rare tumors with a wide variety of histopathologic diagnoses and overall poor prognosis. These tumors tend to have an insidious onset with non-specific symptoms which often leads to advanced local disease at presentation. Because of rarity of individual histologic subtypes of paranasal sinus malignancies, the current AJCC TNM staging system for paranasal malignancies often can not predict overall survival and suggest appropriate treatment modality in a rare histologic malignancy. Management of these tumors is technically challenging because they often present in advanced stages with extensive disease invading important structures such as the orbit and the skull base. Surgery is the treatment of choice in paranasal malignancies. The goal of surgery is complete removal of all tumor with negative resection margins while maintaining the key oncological principles. Open surgery including craniofacial

resection have been a mainstay of treatment in the management of paranasal malignancies and remained the treatment of choice for many advanced tumors. In the last few decades advances, there has been tremendous application of endoscopic techniques to skull base pathologies including sinonasal malignancies. Endoscopic surgery can be an effective alternative to open surgery, especially when combined with adjuvant treatments.

## 두개저 Symposium

Management of small to medium sized vestibular schwannoma

15:50~16:50 • 그랜드홀1

Chairperson(s) : 정종우(울산의대)

### 1. IMAGING UPDATES OF VESTIBULAR SCHWANNOMA

JINNA KIM (DEPARTMENT OF RADIOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE)

### 2. GAMMA KNIFE RADIOSURGERY FOR SMALL TO MEDIUM SIZED VESTIBULAR SCHWANNOMA

SHIN JUNG (BRAIN TUMOR CLINIC & GAMMA KNIFE CENTER, DEPARTMENT OF NEUROSURGERY, CHONNAM NATIONAL UNIVERSITY RESEARCH INSTITUTE OF MEDICAL SCIENCES, CHONNAM NATIONAL UNIVERSITY HWASUN HOSPITAL & MEDICAL SCHOOL, HWASUN-GUN, JEOLLANAMDO, SOUTH KOREA)

### 3. SURGICAL MODALITIES

KI-HONG CHANG (DEPT OF OTORHINOLARYNGOLOGY-HNS, EUNPYEONG ST MARYS HOSPITAL, THE CATHOLIC UNIVERSITY OF KOREA)

### 4. QUALITY OF LIFE ACCOUNTING MANAGING MODALITIES



HYUN JI KIM (DEPARTMENT OF OTORHINOLARYNGOLOGY-HNS, INHA UNIVERSITY COLLEGE OF MEDICINE)

15:50~16:05

## IMAGING UPDATES OF VESTIBULAR SCHWANNOMA

DEPARTMENT OF RADIOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

JINNA KIM

Vestibular schwannomas are usually imaged with MR imaging, with contrast-enhanced scans considered to be the gold standard for the initial evaluation and postoperative assessment of recurrence or residual tumors. High-resolution T2 sequences (including CISS or FIESTA) to follow vestibular schwannomas, however, may adequately characterize changes in lesion size. Specific imaging features with clinical application include, in addition to size and the presence of hydrocephalus, the extent of lateral extension in the internal auditory canal and the presence of cystic intratumoral contents. Imaging is a crucial tool in the evaluation and management of patients with vestibular schwannomas, with MR imaging supplanting computed tomography nearly entirely. Bias as to which patients are treated conservatively and interobserver variation in the definition of growth rate may underlie differential reporting; automated size calculations may remedy this. Higher-resolution T2 sequences and refinements in diffusion tensor imaging may render facial nerve identification even more reliable, providing valuable information to the surgeon, and in turn the patient, preoperatively.

16:05~16:20

## GAMMA KNIFE RADIOSURGERY FOR SMALL TO MEDIUM SIZED VESTIBULAR SCHWANNOMA

BRAIN TUMOR CLINIC & GAMMA KNIFE CENTER, DEPARTMENT OF NEUROSURGERY, CHONNAM NATIONAL UNIVERSITY RESEARCH INSTITUTE OF MEDICAL SCIENCES, CHONNAM NATIONAL UNIVERSITY HWASUN HOSPITAL & MEDICAL SCHOOL, HWASUN-GUN, JEOLLANAMDO, SOUTH KOREA

SHIN JUNG

**목적:** Incidence of small to medium sized VS patients presenting with serviceable hearing has steadily increased. There are various treatment strategies for small to medium sized VS with microsurgery (MS), GKS, and serial observation using MRI. In this study, we presented long term outcomes of small to medium sized VS with serviceable hearing: MS vs. GKS; in addition, we evaluate potential prognostic factors for hearing preservation and discuss appropriate treatment strategies. **방법:** A retrospective review of 504 cases of all VS who underwent MS or GKS between 1993 and July 2019 was conducted. 267 cases underwent surgical resection and 55 (20.6%) of them were small to medium sized VS. 237 cases underwent GKS and 175 (73.8%) of them were small to medium sized VS. For this study, 51 patients were enrolled, and underwent either MS (n=21) or GKS (n=30). **결과:** In the MS group, hearing preservation rate was 71.4% and tumor control rate was 100%. In the GKS group, tumor control rate was 93.3%. Through Kaplan-Meier curve, the hearing PFS rate at 1-, 3-, and 5-years following GKS were 80, 66.7 and 53.3%, respectively. The MS group had higher hearing preservation rate at 5 years. Hearing was preserved statistically significant when preoperative hearing status was class A in the GKS group ( $p=0.016$ ), but it was not statistically significant in the MS group ( $p=0.777$ ). **결론:** We suggest that GKS should be considered as the first treatment

option for small to medium sized VS with non-serviceable hearing, no mass effect for brain stem, and no neurologic symptom. For small to medium sized Vestibular Schwannoma with serviceable hearing, MS seems to be more suited for patients whom are younger, good physical status, good pre-operative hearing status including AAO-HNS class B, and medial type VS. And GKS seems to be more suited for patients whom are elderly, poor physical status, pre-operative AAO-HNS class A hearing.

16:20~16:35

### **SURGICAL MODALITIES**

DEPT OF OTORHINOLARYNGOLOGY-HNS, EUNPYEONG ST  
MARYS HOSPITAL, THE CATHOLIC UNIVERSITY OF KOREA  
**KI-HONG CHANG**

Vestibular schwannoma is a benign tumor and grows slowly. Lately, the tumor size tends to decrease by virtue of a frequent use of magnetic resonance imaging. There are three options in the treatment of vestibular schwannoma; wait & scan, microsurgical removal, and stereotactic radiation therapy. Considering tumor character and growing tendency, the treatment principle of small sized vestibular schwannoma is wait & scan. A particular type of intervention is generally indicated when a tumor grows. However, intervention is also considered for patients with no tumor growing but hearing deterioration during observation. The main surgical modality in the treatment of vestibular schwannoma is translabyrinthine, middle fossa, and retrosigmoid approach. Preoperative hearing and tumor size are known to be the most important factor in choosing the surgical approach. Each approach has different surgical indications, advantages, and drawbacks. The translabyrinthine approach is good for identifying the facial nerve in fundus and for a tumor with marked cerebellar compression. However, hear-

ing is lost after surgery. On the other hand, patients may have a chance for hearing preservation postoperatively if retrosigmoid and middle fossa approach is used. The retrosigmoid approach can be used in patients with preoperative good hearing regardless of the tumor size, but there is a limit in securing the surgical field when the tumor invades the fundus. In contrast, middle fossa approach, which is also able to preserve hearing like the retrosigmoid approach, is easy to treat fundus area, but is difficult to use when the tumor is large. In general, the tumor size and preoperative hearing status is important in selecting surgical approach. However, other factors such as fundus involvement by tumor, cerebellar compression, post-operative facial palsy should not be overlooked as well. Based on my experiences, I would like to present surgical indications and tips for different microsurgical treatment of vestibular schwannoma at this symposium.

16:35~16:50

### **QUALITY OF LIFE ACCOUNTING MANAGING MODALITIES**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HNS, INHA  
UNIVERSITY COLLEGE OF MEDICINE  
**HYUN JI KIM**

In vestibular schwannoma treatment, the choice among treatment modalities is controversial. There are many decision factors for the treatment of vestibular schwannoma. They are age of the patient, tumor size, main location of the tumor, growth ratio of the tumor, hearing level, facial nerve function, and vestibular function. The majority of the tumors are slow growing, and a significant proportion show no detectable growth at all over a period of several years. Observation also known as wait and scan or watchful waiting is therefore considered a safe treatment for patients

with small tumors. However, in case of progressive growth or increasing symptoms, conversion to active treatment may be necessary. The choice among treatment modalities is controversial, especially for small to medium-sized tumors. Over the years, studies have focused on traditional outcome measures, such as tumor control, facial nerve function and hearing level. Over the recent decades, concepts of management for VS have changed considerably. Today, many physicians have moved from eradicating disease to consideration of quality of life as well as preservation of function. Assessment of QOL after management is important parameter in deciding the timing and treatment options offered to patients with vestibular schwannoma. Several study group have evaluated the effect of the various treatments on patients QOL, using well-known generic assessment instruments, such as Short form-36 and Glasgow Benefit Inventory. And there have been suggested that the use of disease-specific measures is essential of measuring small, clinically important changes caused by the disease and its different treatment such as Penn Acoustic Neuroma Quality of Life. Because vestibular schwannoma is a benign condition, it could be argued that as survival is not the issue, QOL becomes all the more important. In this session, QOL in patients with vestibular schwannomas according to management strategy is reviewed and discussed.

## 윤리교육 심포지움

15:50~16:50 • 그랜드홀2

Chairperson(s) : 채성원(고려의대)

15:50~16:10

### 의료분쟁조정법

보건복지부 의료기관정책과

윤동빈

16:10~16:30

### 법조인이 원하는 의료분쟁 예방팁

대한의사협회 법제이사

전선룡

16:30~16:50

### 다빈도로 발생하는 의료분쟁 사례

의료배상공제조합/법무법인 21세기

박재우

## 보험세미나

13:30~15:30 • 세미나실5

15:05~15:30

자유토론

13:30~14:00

### 심사체계 개편과 최신 정책동향

보건복지부 건강보험정책국 보험급여과장

이중규

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14:00~14:30

### 의료환경 변화에 따른 이비인후과의 대처

건강보험심사평가원

양훈식

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14:30~14:40

휴식

14:40~15:05

### 환자분류체계의 과거, 현재, 그리고 미래

가톨릭의대

박찬순

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## Education program I

13:30~14:30 • 세미나실4  
Chairperson(s) : 문인석(연세의대)

13:30~14:30

### 여수탐방

YEOSU CULTURE & TOURISM GUIDE

NAMI YU

여수의 10경(景) - 오동도 - 거문도·백도 - 향일암 -  
금오도 비렁길 - 여수세계박람회장 - 진남관 - 여수밤  
바다, 여수산단야경 - 영취산진달래 - 여수해상케이블  
카 - 이순신대교 여수의 10미(味) - 돌산갯김치 - 계  
장백반 - 서대회 - 여수 한정식 - 갯장어회/샤브샤브  
- 굴구이 - 장어구이/탕 - 갈치조림 - 새조개샤브샤  
브 - 전어회/구이

## Education program II

14:30~15:30 • 세미나실1  
Chairperson(s) : 임재열(연세의대)

14:30~15:30

### JOURNEY TO THE PAST: HISTORY OF THYROID SURGERY

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK  
SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF  
MEDICINE, CHEONAN, KOREA

### JAE HONG PARK

History of the thyroidectomy is a history in the advancement of surgery itself. Prior to the 19th century, the surgery of thyroid gland was clouded in lack of understanding. However, references to the thyroid disease and its treatment can be found in the literature and paintings of ancient medicine. Due to the lack of awareness and poor nutrition including iodine deficiency, Thyroid disease like goiter was widespread in that era. Many physicians had described the thyroid disease in various explanations and had attempted to cure that disease in many ways which was not on the scientific basis. By the 19th century, reasonable basis and explanation of the thyroid gland and its disease enabled the surgical treatment with resecting thyroid gland. However, like other surgery, surgical resection of the thyroid gland was limited by the lack of anesthesia, proper instruments and antibiotics in that time. Much of the progress in thyroid surgery occurred in 20th century by the contribution of the pioneering European and American surgeons with the advances of the surgical technique using proper instrument, antiseptics and biochemical products. Nowadays, modern imaging methods and remarkable surgical devices like endoscope or robot allow the variable access to the thyroid gland, which can be an alternative to the conventional method.

## Education program III

14:30~15:30 • 세미나실4  
Chairperson(s) : 임기정(고려의대)

14:30~15:30

### WINE STORY : CHAMPAGNE

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK  
SURGERY, COLLEGE OF MEDICINE, DANKOOK UNIVERSITY  
PHIL-SANG CHUNG

내가 처음 와인을 제대로 접한 것은 1993년 7월경 미국 캘리포니아의 나파밸리(Napa valley)에 위치한 Robert Mondavi Winery를 방문해서 와인 시음을 하면서였다. 샌프란시스코에서 나파를 가는 중에 펼쳐진 장대한 포도의 바다가 내 갈증을 재촉하고 있었는데 처음 들린 곳이 이 동네에서 가장 크고 유명한 이 곳이었다. 먼저 포도밭을 견학하고 차가운 지하 셀러에서 와인양조 과정과 숙성 중인 엄청난 양의 오크통을 보고 나서 1층에 위치한 와인 시음장에 도착했다. 잘 생긴 백인 남자가 와인병을 멋지게 따서 품 나게 따르고 몇 번 돌린 후 코를 잔에 쿡 박고 벌름거리더니 다시 입으로 한 모금 마시고 볼을 쥔듯 거리더니 두 눈을 감고 천천히 꿀꺽 삼키는 것을 보고 속으로 아니꼬운 마음이 드는 것을 막을 수가 없었다. 한 두 번 그렇게 맛을 보더니 우리에게도 따라 하라 해서 대충 시늉만 내고 벌컥 마셨더니 시고 떼려름한 맛만 났다. 그런데 옆에 사람들은 아주 황홀한 표정을 지으며 그 맛을 음미하는 것을 보고 내가 와인 촌놈이구나 하는 마음을 지울 수 없었다. 그 다음에 그 백인 남자가 와인 시음에 대해 설명을 시작하는데 비교적 영어가 짧았던 내게도 익숙한 단어들만 마구 들려 오는 것이었다. Nose, smell, taste, tongue, palate, uvula, tongue base, pharynx, nasopharynx, olfactory system 등등. 와인시음에 중요한 구조물을 계속 강조하는 데 문득 와인 시음은 이비인후과 의사가 해야 할 것

같은 생각이 들었고 그가 시키는 대로 천천히 코로 냄새 맡고 와인으로 혀끝에서부터 혀 전체를 감싼 후 구강 인두를 지나 식도로 넘어가는 와중에 일부 향이 다시 비인강을 통하여 후각시스템을 자극하는 것이 아닌가? 이렇게 천천히 전공을 살려가면서 마셔 보니 그 맛의 alcohol 과 tannin, 그리고 신맛의 오묘한 조화가 조금 느껴지는 듯도 하였다. 사실 그 때 먹은 와인이 Robert Mondavi Cabernet Sauvignon Napa Valley로 그 이후 한국에서는 그때의 맛을 재현할 수 없었다. 그 후 내 나름 와인에 관심을 가지고 무작정 많이 마시다 보니 와인에 대한 단편적인 지식을 가지게 되었고 이런 저런 와인 책을 읽고 와인 전문가라 하는 분들의 강의도 듣고 토론과 시음도 하면서 조금씩 와인에 대한 이해를 높게 되었다. 그리고 세계 각지를 갈 때마다 그 지역의 와인을 맛보고 포도 품종과, 기후, 양조법에 관심을 가지다 보니 조금 더 와인의 맛과 향, 그리고 그 지역의 특성을 느낄 수 있게 되었다. 이 번 강의에서는 축제의 와인이라 불리는 샴페인을 중심으로 저의 자그마한 지식과 경험을 공유하고자 합니다.

## Education program IV

15:50~16:50 • 세미나실1  
Chairperson(s) : 김현직(서울의대)

15:50~16:50

### REVIEW OF SLEEP STAGE SCORING AS AASM SLEEP SCORING MANUAL VERSION 2.5 ON POLY-SOMNOGRAPHY

DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY ANSAN HOSPITAL, KOREA UNIVERSITY COLLEGE OF MEDICINE  
SEUNG HOON LEE

Proper scoring and interpretation of the sleep stage is very important in the type 1 polysomnography performed for accurate diagnosis of sleep apnea patients. In 2007, the American Academy of Sleep Medicine (AASM) proposed standardized rules for the determination of sleep stages through “the AASM manual for the scoring of sleep and associated events—rules, terminology and technical specifications”. After the 2nd edition version in 2012, it was published as a minor update every year until version 2.5 of 2018. If the sleep stage can be divided into stage W, stage N1, stage N2, stage N3, and stage R when reading the sleep polysomnography, each of these stages has a specific waveform on the result of EEG (ElectroEncephaloGram), EOG (ElectroOculoGram), and EMG (ElectroMyoGram). EEG and EOG findings that reflect stage W in determining sleep stages for type 1 polysomnography include alpha rhythm, eye blinks, reading eye movements, rapid eye movements (REMs), and slow eye movements (SEM); EEG and EOG findings reflecting stage N1 include low-amplitude mixed-frequency (LAMPF) EEG activity, vertex sharp waves (V waves), slow eye movements (SEM); EEG findings reflecting Stage N2 include K complex, sleep spindle; EEG findings reflecting stage N3 include slow wave activity; EOG, EMG and EEG findings reflecting stage R include rapid eye movements (REMs), low chin EMG tone, sawtooth wave, and transient muscle activity. This education program focuses on the sleep scoring rules in “the AASM manual for the scoring of sleep and associated events, version 2.5”, in line with the eye level of otolaryngologists who are not familiar with EEG and EOG-oriented sleep scoring. In this course, we describe the characteristic findings that represent each sleep stage and the general rules that affect the transition in each stage of sleep.

## Education program V

15:50~16:50 • 세미나실4

Chairperson(s) : 이환호(고신의대)

15:50~16:50

### 싱글몰트 위스키의 이해

DEPARTMENT OF OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY, ULSAN UNIVERSITY COLLEGE OF MEDICINE, ASAN MEDICAL CENTER

JOONG HO AHN

격무에 지친 일상을 뒤로하고 퇴근 후 소파에 앉아 투명한 글래스에 담긴 아이스 볼 위로 흐르는 열은 카라멜 색상의 위스키 한 모금! 켈트어로 “생명의 물”을 의미하는 위스키는 와인이나 소주와 달리 병을 오픈해도 오랫동안 두고 마실 수 있어 집에서, 혹은 바에서 잔으로 즐길 수 있는 장점이 있습니다. 여러 증류소에서 생산된 몰트 혹은 그레이н 위스키를 섞어 만든 일반적인 위스키와 달리, 각 증류소마다의 강한 개성을 드러내는 싱글 몰트 위스키는 개인의 차별성을 중시하는 요즘 트렌드와 맞아 떨어져서 점차 인기를 얻고 있습니다. 이번 강의를 통해 싱글 몰트 위스키의 전반에 관한 지식과 위스키를 즐길 수 있는 방법 등에 대한 지식을 넓히시길 바랍니다.

## OTOP 1

외이기형 및 안면신경, 외상 및 종양

07:50~08:50 • 그랜드홀1

Chairperson(s) : 장기홍(가톨릭의대), 전범조(가톨릭의대)

### OTOP-01 07:50~08:00

#### SURGICAL RESULT OF COMBINED AURICULO-MEATOPLASTY IN MICROTIA

<sup>1</sup>SOREE EAR CLINIC, <sup>2</sup>PROFILE PLASTIC SURGICAL CENTER  
HO-KI LEE<sup>1,2</sup>, JAIHO CHUNG<sup>2</sup>

**목적:** The goal of microtia surgery is to create both good function and good appearance of the ear. There continues to be controversy over who should operate first, the plastic or the ear surgeon. There are advantages and disadvantages of each meatoplasty before, and after auriculoplasty. The purpose of this study is to review the surgical result of combined auriculo-meatoplasty performed by plastic and ear surgeon together to overcome the disadvantages of each microtia surgery. **방법:** Seventeen patients (average age: 18 years old, ranging from 6 to 47) underwent the combined meatoplasty and auricular reconstruction with endoscope-assisted temporoparietal fascia flaps since August 2018. Physical outcome of auricle and meatus (location, appearance, and complication rate) and hearing results were evaluated. Surgical procedure and reconstruction techniques are reviewed. **결과:** Skin flap showed edematous state until postoperative 3 months, but no infection sign was identified. All patients showed successful healing process without any major complications. No exposed Medpor from auricle was noted except a case of post-traumatic accident. A patient, who is the first case of combined surgery, has lower lying auricle than we designed

preoperatively. However, the position of auricle was corrected with an additional minor surgery. Post-operative average hearing gain was 35 dBHL when the tympano-ossiculoplasty was performed. A case with sensorineural hearing loss worse than 10 dBHL after surgery was identified. There were 4 cases that required the mold for prevention of postoperative stenosis at meatal orifice. **결론:** Combined auriculo-meatoplasty performed by plastic and ear surgeon together has many advantages including fewer surgical stages, immediate ear projection, and early hearing restoration. This procedure with Medpor can be performed at young age, and the cosmetic and functional ear reconstruction can be completed before entering school.

### OTOP-02 08:00~08:10

#### RECURRENT BELL'S PALSY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

SUNG HWA DONG, MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** The purpose of this study was to evaluate the clinical manifestations of recurrent Bell's palsy through a systematic review and meta-analysis. **방법:** The SCOPUS, PubMed, Cochrane Library and EBSCO databases were searched through 1 May 2018, using the search terms **결과:** A search of titles and abstracts in these four databases identified 222 studies; of these, 27 studies, involving 1041 patients from 13 countries, were analysed. The mean percentage of patients who experienced recurrence of Bell's palsy ranged from 0.8% to 19.4%. Five studies that included 191 patients were included in the meta-analysis. **결론:** Among patients previously affected by Bell's palsy, the mean



incidence of recurrent Bell's palsy was 6.5%. Sidedness of recurrent disease, relative to the side of the original disease, had no effect on patient prognosis. Of all patients with Bell's palsy, 66.0% recovered completely, with the recovery rate lower in patients with recurrent than with primary Bell's palsy.

**OTOP-03 08:10~08:20**
**TOTAL AURICULAR RECONSTRUCTION : A SINGLE SURGEON'S EXPERIENCE WITH 24 PATIENTS**

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

GINA NA, DONG CHUL CHA, SE A LEE, SUNG HUH KIM

**목적:** To report the results of total auricular reconstruction in microtia patients. **방법:** We retrospectively reviewed the patients' medical records from 2011 to 2018 at the Severance hospital. Subjects were 24 individuals (age, 9–63 years) and underwent total auricular reconstruction with modified Nagata technique by a single surgeon. We assessed the results according to overall shape, symmetry of both ears, appearance of auriculocephalic sulcus and complications. **결과:** Among the 24 patients, 9 patients (37.5%) had good overall shape, 10 patients (41.7%) were moderate, and 5 patients (20.8%) were poor. The auricular size between two ears was symmetric in 21 patients (87.5%) and asymmetric in 3 patients (12.5%). The appearance of auriculocephalic sulcus was good in 8 patients (36.3%), partial stricture in 10 patients (45.5%), and severe stricture in 4 patients (18.2%). Eight patients had reversible or irreversible postoperative complications. All complications occurred in patients using autologous cartilage, and in the case of reconstruction using Medpor®, there were no complications for 2 years. **결론:** Total auricular reconstruction is a complex and sophisticated operation. For successful

surgery, the proper flap design and cartilage framework manipulation are essential to fulfill the aesthetic concept of face and ear. Without sufficient training, the success rate is a bit low and the incidence of complications is relatively high, so the experienced reconstructive surgeon is demanding.

**OTOP-04 08:20~08:30**
**A PROSPECTIVE, LONGITUDINAL STUDY OF SELF-CORRECTION ACCORDING TO DEFORMITY TYPE IN CONGENITAL AURICULAR DEFORMITY**

DEPARTMENT OF OTORHINOLARYNGOLOGY PUSAN NATIONAL UNIVERSITY SCHOOL OF MEDICINE  
SE-JOON OH

**목적:** The aim of this study was to investigate the associating factors for the prevalence of the congenital auricular deformities and to evaluate the long-term frequencies of self-correction in the congenital auricular deformities. **방법:** A prospective longitudinal study of 90 newborns was conducted. Data were collected within 2 weeks after birth, and 12 months. We classified the shape of auricle into 7 categories using digital image measurement. At 2 weeks after birth, several birth related factors were evaluated after dividing auricular deformity group and normal group. At 1 year after birth, the images of auricles were compared with the images at birth and the changes of auricular shape were investigated. **결과:** Congenital auricular deformities were observed in 139 out of 180 ears (77.2%), and the major type of congenital auricular deformity was helix deformation (47 cases, 22.9%), followed by normal (41 cases, 20%). 33 cases (16.1%) of cup ear, 32 cases (15.6%) of prominent ear, 27 cases (13.2%) of shell ear and others were the smallest with 4 cases (2.0%). Male was found to have statistically significant association with high rate of auricular deformity. ( $p=0.002$ ) Among 43 neonates who could be able to

follow up 12 months later, the self-healing rate was 33 percent. Normal auricle increased ( $p<0.001$ ) and helix rim deformity decreased significantly, respectively. ( $p<0.001$ ) **결론:** Gender was associated with the congenital auricular deformity and the prognosis of deformity was various depending on the types of deformities. With time, because the prominent ears tend to increase, newborns with prominent ear might be recommended to treat as possible.

#### OTOP-05 08:30~08:40

### TUMOR GROWTH AND HEARING CHANGES IN THE NATURAL PROGRESS OF VESTIBULAR SCHWANNOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE

YUN JI LEE, SEUNG JAE LEE, BO GYUNG KIM, CHI KYOU LEE, BYUNG DON LEE, JONG DAE LEE

**목적:** Vestibular schwannoma(VS) is a benign neoplasm originating from the vestibular nerve, and the most common symptom caused by the tumor is unilateral hearing loss. This study is aimed to review the clinical outcomes of tumor growth and hearing changes in the natural progress of VS. **방법:** We retrospectively reviewed 28 patients who were diagnosed with VS and treated with wait and scan modality for more than a year. We analyzed the patients' audiological changes and tumor growth by reviewing the temporal bone MR images. Patients were classified into an intrameatal group and extrameatal group according to the involvement of the cerebropontine angle. **결과:** The overall mean follow-up was  $45.6\pm 25.8$  months. Among the 28 patients, 6 (21.4%) showed tumor growth after wait and scan. Hearing thresholds and speech discrimination scores showed deterioration after wait and scan in both groups. Among the 12

patients with serviceable hearing at initial diagnosis, 9 (75.0%) preserved serviceable hearing after wait and scan. When pure tone averages and speech discrimination scores were applied to the scattergram, most values were positioned near the center of the scattergram, which implied the preservation of serviceable hearing after wait and scan. **결론:** The percentage of patients showing tumor growth after wait and scan policy was low. Patients with serviceable hearing at diagnosis would most likely preserve their hearing after wait and scan. Considering the limited tumor growth and minimal hearing changes, conservative wait and scan policy rather than microsurgery or radiation surgery is an alternative treatment modality in patients with small-sized, non-growing VS.

#### OTOP-06 08:40~08:50

### EFFECT OF DIRECT CURRENT ELECTRICAL STIMULATION ON THE RECOVERY OF FACIAL NERVE CRUSH INJURY

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL, <sup>2</sup>DEPARTMENT OF BIOTECHNOLOGY & TISSUE ENGINEERING LAB, SUNGKEUNKWAN UNIVERSITY

CHULHO JANG<sup>1</sup>, JIUN LEE<sup>2</sup>, GEUNHYUNG KIM<sup>2</sup>

**목적:** To date, few regeneration studies have been conducted on facial nerve (FN) crush models using electrical stimulation (ES); hence, the mechanisms by which ES promotes neural regeneration after crush injury of the FN remain relatively poorly understood. In this study, we investigated the effect of direct current ES on proliferation, survival, and neurite growth as well as gene upregulation in PC12 cells. We also investigated the enhancing effect of ES in a rat FN crush injury model without any invasive treatment. **방법:** To evaluate the neuronal differentiation of PC12 cells by ES, an electrical stimulator was designed with

an ITO film and PDMS mold. Direct current ES (100 mV/cm) was applied for 4 h/day until day 7. To evaluate the combined effect of NGF and ES on neuronal differentiation, a medium containing 50 ng/mL of NGF was used for culturing the ES/NGF group cells. A live/dead assay using confocal microscopy was used to evaluate cell viability. Cell proliferation was evaluated by MTT. To quantitatively measure the expression levels of  $\alpha$ -internexin(InA), neurofilament low molecular weight (NFL), and  $\beta$ 3-tubulin (Tubb3), real-time polymerase chain reaction was performed after 5 days of cell culture. For in vivo study, direct current ES stimulations were performed using a constant current stimulator to deliver a current of 0.1 mA for 10 min per day for 3 weeks. Recovery was evaluated by observation of vibrissae movement (VM) electrically evoked muscle action potential (EMAP), and transmission electronmicroscopic findings **결과:** The ES condition induced significant neurite outgrowth and highly enhanced gene expression than did the absence of ES. The cells under the ES/NGF condition were better differentiated and showed more significant neurite outgrowth than did the cells under the ES condition. The transcutaneous direct current ES promoted the recovery of VM, reduced the threshold of EMAP, and enhanced axonal regeneration. **결론:** From these results, direct current ES can be helpful for rehabilitation of facial nerve crush injury.

## OTOP 2

기타기초

07:50~08:50 • 세미나실2

Chairperson(s) : 박소영(가톨릭의대), 권중근(울산의대)

OTOP-07 07:50~08:00

### RUTHENIUM CHLORIDE INDUCED OXIDATIVE CYCLIZATION OF TRANS-RESVERATROL TO (±)-(E)- $\omega$ -VINIFERIN AND ANTIMICROBIAL AND ANTIBIOFILM ACTIVITY AGAINST STREPTOCOCCUS PNEUMONIAE

DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY COLLEGE OF MEDICINE

MUKESH KUMAR YADAV, JAE-MIN JEON, KARABASAPPA MAILAR, JAGADEESH NAGARAJAPPA MASAGALLI, SUNG-WON CHAE, WON JUN CHOI, JAE-JUN SONG

**목적:** Polyphenol  $\epsilon$ -viniferin (2) is a protective phytochemical found in several plant families. Here, we report a simple and effective method for the synthesis of (±)- $\epsilon$ -viniferin (2) as major product and (±)-(E)- $\omega$ -viniferin (3) as a minor product **방법:** Synthesized viniferin compounds and standard viniferin were analyzed for antibacterial and antibiofilm activity against Gram-positive bacteria *Streptococcus pneumoniae*. **결과:** The minimum inhibitory concentrations (MICs) of (±)- $\epsilon$ -viniferin (2) and standard viniferin were 20  $\mu$ m. However, the MICs of (±)-(E)- $\omega$ -viniferin (3) and compound 8 were 40  $\mu$ m. Although viniferin significantly ( $p < 0.05$ ) reduced pre-established in vitro biofilms and killed bacteria within the biofilm, it was unable to prevent biofilm formation at sub-MIC concentrations. The time kill experiment revealed that viniferin killed bacteria and reduced 2.8 log<sub>10</sub> bacteria

at  $2 \times \text{MIC}$  concentration after 24 h. SEM analysis and live/dead biofilm staining of pre-established biofilms revealed that viniferin treatment disrupts membrane integrity of biofilm bacteria. Crystal violet absorption, total protein, and DNA and RNA release revealed that viniferin alters bacterial cell permeability, eventually killing bacteria. **결론:** Viniferin and its derivatives may be a candidate molecules for novel antimicrobial agents against pneumococci through its antibacterial and antibiofilm activities.

**OTOP-08 08:00~08:10**

**AGE-RELATED HEARING LOSS DUE TO APOPTOSIS OF THE COCHLEAR SPIRAL GANGLION NEURONS IN ATHEROSCLEROSIS IN VIVO AND POPULATION-BASED STUDY**

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YOO YEON KIM<sup>1</sup>, JANET REN CHAO<sup>2</sup>, CHULHO KIM<sup>3</sup>, JUNGHWA BAHNG<sup>4</sup>, JIWON CHANG<sup>5</sup>, JUN GYO SUH<sup>1</sup>, JUN HO LEE<sup>5</sup>

**목적:** We hypothesized that up-regulated S100B expression induces apoptosis of the cochlear spiral ganglion neurons (SGNs) in atherosclerotic ApoE KO mice, resulting in neural hearing loss. In addition, we evaluated whether the degree of high frequency hearing loss, a hallmark of age-related hearing loss

(ARHL), differ according to the atherosclerotic cardiovascular disease risk in general population. **방법:** We compared cochlear SGNs with C57BL/6J male mice with chow diet, ApoE KO male mice with chow diet or western diet. To proof the results of experimental study, atherosclerotic cardiovascular disease (ASCVD) score and audiogram in national population study were analyzed. **결과:** Hyperlipidemia, atherosclerosis, and hearing loss developed over time in the ApoE KO-WD cohort. Hearing loss correlated with a higher percentage of atherosclerotic lesions in the aorta. Degeneration of the SGNs was observed by histological analysis of the cochlea. The plasma and SGNs S100B were increased in ApoE KO-Western diet mice, although RAGE was decreased. Caspase-3 and TUNEL in SGNs were significantly increased in ApoE KO-Western diet mice. In population-based study, age and sex were the significant predictors for ARHL in multivariate logistic model. In addition, hearing loss in middle and high frequency sound were positively associated with the increasing of the ASCVD score. **결론:** These results suggest that increased expression of S100B may produce neural apoptosis and degeneration of the cochlear SGNs, resulting in neural hearing loss in atherosclerotic ApoE KO mice. And, the degree of hearing loss was positively correlated with ASCVD risk in middle and high frequency sound.

**OTOP-09 08:10~08:20**

**ANALYSIS OF AEP THRESHOLD CHANGES & INNER EAR HAIR CELL DAMAGE AFTER INTRA-PERITONEAL INJECTION OF AMINOGLYCOSIDE IN ADULT ZEBRAFISH**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY COLLEGE OF MEDICINE, KOREA UNIVERSITY ANSAN HOSPITAL, <sup>2</sup>LABORATORY OF NEURODEVELOPMENTAL GENETICS, GRADUATE SCHOOL OF MEDICINE, KOREA UNIVERSITY, <sup>3</sup>BIOMEDICAL RESEARCH

CENTER, KOREA UNIVERSITY ANSAN HOSPITAL

JUNE CHOI<sup>1</sup>, EUNJUNG HAN<sup>1,2</sup>, YOON CHAN RAH<sup>1</sup>,  
YOUNG-SOO CHANG<sup>1</sup>, SAEMI PARK<sup>1</sup>, SOONIL  
KOUN<sup>3</sup>, HAE CHUL PARK<sup>2</sup>

**목적:** The purpose of this study was to demonstrate changes of AEP and the extent of hair cell damage in the zebrafish inner ear, following systemic aminoglycoside administration. **방법:** In the current study, we did intraperitoneal injection of gentamicin of 2.5, 20, 40 ug to adult zebrafish and observed gentamicin absorption and disappearance (wash out) in the inner ear. Then we counted the number of hair cells to confirm gentamicin's influence on hearing of zebrafish. In addition, we measured AEP (auditory evoked potential) threshold, which can measure a saccular response responding to sound. **결과:** In zebrafish inner ear, especially, utricle, Lagena, saccule, the number of hair cells decreased after gentamicin injection until 24 hours. In utricle, 20 % of hair cells were damaged in region 1-4. In Lagena, 20-30% of hair cells were destructed in region 1-3. In saccule, 20-40% of hair cells decreased in percent length from rostral end of saccule (5%~90%). In AEP device, we measured adult zebrafish threshold from 800Hz to 8000Hz. Threshold was the lowest in 800Hz and 1000Hz and it increased as get higher frequency. **결론:** In this study, we confirmed AEP changes and inner ear hair cell damage in adult zebrafish. Furthermore, we will try to figure out drugs that can prevent hair cell damage by comparing hair cell morphology and the hearing threshold.

OTOP-10 08:20~08:30

## PROS AND CONS OF WNT SIGNALING DURING THE DEVELOPMENT PROCESS OF INNER EAR ORGANOID

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD &amp; NECK

SURGERY, COLLEGE OF MEDICINE, DANKOOK UNIVERSITY

NATHANIEL CARPENA, SO-YOUNG CHANG, JAE  
YUN JUNG, MIN YOUNG LEE

**목적:** Wnt signaling is thought to be involved in the inner ear development. However, Wnt signaling is also involved in the cell fate specification of different tissue developments other than inner ear. We recently showed the generation of inner ear organoid including hair cell like-cells from mouse embryonic stem cells, but efficiency of this differentiation process was questionable. Therefore, our aim for current study was to improve the efficiency of generating of inner ear hair cells by a timed supplementation of a Wnt agonist. **방법:** Both mouse embryonic stem cells with (mGFP-ES) and without (J1mESC) green fluorescent protein were used to generate embryonic bodies (EBs) via hanging drop technique. For the differentiation into inner ear organoids, non-neural ectoderm was first induced with treatments of BMP4 and SB431542 followed by pre-placodal ectoderm induction with treatments of FGF2 and LDN193189. Wnt signaling activation was done with the addition of CHIR99021 (potent Wnt agonist). The EBs were cultured until day 21. Morphologically, number of otic-like vesicle, and vesicle per each EBs were compared. Expression of hair-cell differentiation markers were compared by PCR. **결과:** The resulting EBs after Wnt activation has higher success in forming otic-like vesicles and a higher number of vesicles per EB than the EBs without the Wnt agonist. High expression of otic differentiation markers, such as Myosin VIIa were observed in with Wnt activation. However, the Wnt agonist treated EBs also generated other organoids with different morphology including beating organoids. **결론:** The current study demonstrated that Wnt signaling enhances the development of otic organoids. But the differentiation of other cells within the EBs towards different lineages can also be affected by Wnt overactivation.

## OTOP-11 08:30~08:40

**OVEREXPRESSION OF ARYL HYDROCARBON RECEPTOR (AHR) LINKED WITH OXIDATIVE STRESS RESPONSE FOLLOWING FINE PARTICULATE MATTER INJECTION IN THE TEMPORAL CORTEX**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, CHA UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>SENSORY ORGAN RESEARCH INSTITUTE, SEOUL NATIONAL UNIVERSITY MEDICAL RESEARCH CENTER SEOUL, SOUTH KOREA

SO YOUNG KIM<sup>1</sup>, DA-HYE LEE<sup>1</sup>, SOHYEON PARK<sup>2</sup>,  
BYEONG-GON KIM<sup>2</sup>, SEUNG HA OH<sup>2,3</sup>, JUN HO  
LEE<sup>2,3</sup>, MYUNG-WHAN SUH<sup>2,3</sup>, MOO KYUN PARK<sup>2,3\*</sup>

**목적:** The inflammatory stimuli including particulate matter (PM) was reported to induce the expression of aryl hydrocarbon receptor (Ahr) which activated the oxidative stress response. This study was aimed to investigate the impact of fine PM on the Ahr and oxidative stress response in the primary auditory cortex. **방법:** The PM2.5 (1.8 – 0.56  $\mu$ m) – loaded filters suspended in sterile saline to 102.6 – 111.82  $\mu$ g/ml. The 10  $\mu$ l of PM2.5 were intracranially injected to the temporal cortex (PM2.5 group, n = 6). The equal volume of saline was injected to the temporal cortex in control group (n = 6). One week after intracortical injection, the temporal cortex was harvested. The transmission electron microscope examination was performed to evaluate the distribution of PM2.5 in the temporal cortex. The expression levels of cytochrome P450 1A1 (CYP1A1), CYP1B1, inducible nitric oxide synthase (iNOS), Ahr, Brevican, vesicular glutamate transporter (VGLUT1), VGLUT2, and vesicular GABA transporter (VGAT) were measured using quantitative reverse transcription or western blotting. **결과:** The injected PM2.5 was observed in the vesicles in the temporal cortex. The PM2.5 group demonstrated increased expression of oxidative stress factors

of CYP1A1, CYP1B1, and iNOS. The Ahr expression was elevated in the PM2.5 group. Brevican and VGAT were upregulated, while VGLUT1 and VGLUT2 were downregulated in the PM2.5 group. **결론:** The PM2.5 upregulated Ahr expression via oxidative stress responses in the temporal cortex. The oxidative stress response mediated increased expressions of brevican and inhibitory vesicular transporter, while decrease the excitatory vesicular transporter expressions.

## OTOP-12 08:40~08:50

**PROTECTIVE PROPERTIES OF PRE- AND POST-TREATMENT OF DEXAMETHASONE AGAINST KANAMYCIN INDUCED OTOTOXICITY IN THE MOUSE: EX VIVO MODEL**

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JUNG EUN PARK<sup>1</sup>, YOUNG JOON SEO<sup>2</sup>, SEOK JIN HONG<sup>1</sup>, SUNG KYUN KIM<sup>1</sup>

**목적:** Glucocorticoids are known to have anti-inflammatory and immune suppression effects, and have otoprotective effect by binding to glucocorticoid receptors in the inner ear. Herein, we hypothesized that dexamethasone can facilitate to protect against the aminoglycoside induced ototoxicity as ex vivo model. **방법:** The cultured explant cochlea of ICR mouse (P3) were incubated in kanamycin (0.4 mM) for 24 hrs and dexamethasone (100 $\mu$ g/ml) was restored before or after incubation of kanamycin for 48 hrs. The morphological changes in the hair cells (HCs) were evaluated by immunostaining of primary antibodies for Myosin 7a (1:100). Alexa 488-conjugated secondary antibodies and alexa 647-conjugated phalloidine were used for detection, and Fluoroshield was used to label the nuclei. The entire cochlea was divided into

five pieces of equal length designated the basal (2/5), middle (2/5), and apical (1/5) turn of the cochlea. Three 100  $\mu$ m regions in each turn were counted for ototoxic damage in HCs. **결과:** There were no significant differences in HCs counts between control explants and explants treated with dexamethasone. Loss of HCs to kanamycin was higher in mid and basal turns than in apical turn. The number of HCs were most in the basal and apical turn of pretreatment group. **결론:** The results indicated that dexamethasone attenuates kanamycin ototoxicity in both pretreatment and posttreatment. The otoprotective properties of dexamethasone against kanamycin was effective pretreatment than rescue treatment.

## OTOP 3

중이 기초

10:30~11:30 • 세미나실2

Chairperson(s) : 장철호(전남의대), 강성호(건국의대)

**OTOP-13 10:30~10:40**

### USEFULLNESS OF VALSALVA TEMPORAL BONE COMPUTED TOMOGRAPHY AS VISUALIZED EVALUATION TOOL OF EUSTACHIAN TUBE

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SEOKHWAN LEE<sup>1</sup>, SUNG-WON CHOI<sup>1</sup>, IL-WOO LEE<sup>2</sup>, HYUN MIN LEE<sup>2</sup>, JUNG WOO LEE<sup>1</sup>, SE-JOON OH<sup>1</sup>, SOO-KEUN KONG<sup>1</sup>

**목적:** The purpose of this study is to evaluate the usefulness of temporal bone computed tomography with valsalva maneuver(Valsalva CT) as a visualized evaluation tool of eustachian tube in patients with patulous eustachian tube, chronic otitis media and non-middle ear related problems group. **방법:** 20 patients with patulous eustachian tube(PET), 48 patients with chronic otitis media(COM) and 15 patient with non-middle ear related problems were undergone temporal bone computed tomography during performing valsalva maneuver. Multiplanar reconstruction was performed along the axis of the eustachian tube to visualize full length of eustachian tube or longest segment of the dilated cartilagenous tube. In case of partial visualization of eustachian tube, ratio of visualized segment of the tube to the nonvisualized segment was measured. **결과:** Whole length of eustachian tube was visualized in 21/28(75%), 7/57(12%), 11/30(37%) ears in patients with PET, COM and non-middle ear related problems, respectively. Ratio of visualized segment of the tube to the nonvisualized segment was significantly higher in PET and lower in COM patients. **결론:** Valsalva CT is useful for indentifying obstructed segment through visualization of eustachian tube in high resolution. It is worthwhile to conduct further research to apply it to diagnosis and indications of procedures in eustachian tube related diseases.

**OTOP-14 10:40~10:50**

### VISUALIZATION OF EUSTACHIAN TUBE WITH OPTICAL COHERENCE TOMOGRAPHY

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, HANYANG UNIVERSITY, <sup>2</sup>DEPT OF MECHANICAL ENGINEERING, KAIST

JAE HO CHUNG<sup>1</sup>, HAYOUNG BYUN<sup>1</sup>, SEUNG HWAN LEE<sup>1</sup>, YEONHOON KIM<sup>2</sup>, HONGKI YOO<sup>2</sup>

**목적:** The Eustachian tube is a long tubular struc-

ture connecting the nasopharynx and the middle ear cavity. Optical Coherence Tomography (OCT), a high-resolution medical imaging technique based on optical interference, provides microstructural imaging inside living tissues. The aim of the study was to assess anatomical structure and change of Eustachian tube using a fiber-based OCT probe with a diameter of less than 1mm. **방법:** The Eustachian tubes of swine was harvested and used for the image test and histological analysis. To obtain microstructural tomographic images of the Eustachian tubes, we used a swept-source OCT System with a center wavelength of 1310 nm. The OCT imaging catheter made of ball lens probe has an outer diameter of 0.96 mm for insertion into the Eustachian tube without damaging the tissue. Three-dimensional imaging was obtained by helical scanning of the imaging probe at a rotational speed of 50 rps and a translation speed of 1 mm/s with OCT. In addition, OCT image was acquired after ballooning of Eustachian tube with balloon tipped catheter (OD 5mm). Histological images of the corresponding Eustachian tubes were compared to images obtained by the OCT System. **결과:** OCT image catheter was successfully inserted in the lumen of Eustachian tube. The cross-sectional images of Eustachian tube were obtained, and anatomical structures can be distinguished. After ballooning of the Eustachian tube, the expansion of the cross-section area was identified. **결론:** We developed the OCT catheter with an outer diameter of only 0.96 mm which is suitable for imaging Eustachian tube. The application of OCT in the visualization of Eustachian tube lumen might be feasible and potentially have diagnostic value.

**OTOP-15 10:50~11:00**

#### **ANATOMICAL EVALUATION OF THE EUSTACHIAN TUBE USING OPTICAL COHERENCE TOMOGRAPHY(OCT)**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KOSIN UNIVERSITY COLLEGE OF MEDICINE, BUSAN, KOREA

**YEONG-WOOK JEONG, YOON-SOO SEO, SUNG-WON KIM, JOO-YEON KIM, JAE-HWAN KWON**

**목적:** Optical coherence tomography(OCT) is a good diagnostic imaging modality that shows cross-sectional images of living tissues by analyzing the coherence pattern of the reflected light. The exact anatomy and function of Eustachian tube have not been evaluated even development of diagnostic instruments, yet. Using this technology, we have imaged the full length of human Eustachian tube and figured out. **방법:** Between August 2018 and March 2019, 8 adult patients (8 Eustachian tubes) with chronic otitis media were examined using OCT during surgery. The OCT catheter was inserted from the middle ear to nasopharynx and the imaging system was introduced backward to obtain the entire morphology of E-tube. **결과:** Entire imaging of the Eustachian tube was obtained with a characterization of the 2 different portions: an osseous posterolateral portion and a fibrocartilaginous antero-medial portion. Also, the total length of the Eustachian tube was measured  $44.5 \pm 6.0$ mm (range 36.3–52.7mm). The length of the osseous part was  $14.7 \pm 3.4$ mm (range 9.3–18.6mm), accounting for  $32.9 \pm 5.2\%$  (range 23.6–39.6%) of the total length of each case. The length of the fibrocartilaginous part was  $35.3 \pm 5.7$ mm (range 24.5–43.3mm), accounting for  $79.4 \pm 8.0\%$  (range 62.7–88.6%) of the total length of each case. In addition, these two portions were overlapped by  $5.5 \pm 2.6$ mm (range 0.9–9.2mm) and  $12.2 \pm 5.1\%$  (range 2.3–17.5%) of the total length of each case for the cartilage extends into the roof of the osseous part. **결론:** The anatomical structures such as the length, portion of the Eustachian tube examined using OCT showed similar results to the well-known statistical value. This study has great significance in that it is the first study to demonstrate the full length of the



Eustachian tube using the OCT.

### OTOP-16 11:00~11:10

#### MASTOID OBLITERATION USING HUMAN TONSIL-DERIVED MESENCHYMAL STEM CELLS-LOADED HYDROXYAPATITE-CHITOSAN PATCH

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**목적:** Mastoid cavity reconstruction after surgical management of chronic ear diseases such as cholesteatoma and otitis media remains an unsolved problem. The goal of this study was to evaluate the ability of the combination of human tonsil-derived mesenchymal stem cells (hTMSCs) with a hydroxyapatite (HAp)-chitosan patch in promoting osteogenesis in the treatment of postoperative temporal bone defect using an animal model. **방법:** Twenty-eight healthy, 10-week-old male Sprague Dawley rats were divided into four groups: (1) sham surgery group, (2) hTMSCs group, (3) patch group (HAp-chitosan patches only), and (4) hTMSCs + patch group. Histologic findings and computed tomography images were obtained from each tympanic bulla at 12 weeks post-surgery, and the obliteration ratio and new bone formation were evaluated among groups. **결과:** Compared with the sham and hTMSCs groups, both patch group and hTMSCs + patch group showed significantly higher obliteration ratios and new bone formation. Moreover, the hTMSCs + patch group showed new bone for-

mation in both the periphery and central region of the tympanic bulla cavity, which indicating prominently enhanced osteogenesis compared to the patch group.

**결론:** Combining hTMSCs with a HAp-chitosan patch showed accelerated osteogenesis for reconstruction of postoperative temporal bone defects.

### OTOP-17 11:10~11:20

#### OVERLAY VERSUS UNDERLAY ENDOSCOPIC TYMPANOPLASTY

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**목적:** 내시경을 이용한 귀수술이 증가하고 있으며, 가장 많이 시행되는 술식은 내시경을 이용한 고실성형술이다. 내시경을 이용한 경외기도 고실성형술과 현미경을 이용한 고실성형술을 비교할 때, 재발율이나 청력개선 정도에 있어서 유사한 결과를 보인다는 것은 잘 알려져 있다. 내시경을 이용할 경우에 수술 시간이 단축되고 심미적인 장점이 있으며, 외기도 성형술의 필요성이 줄어든다고 한다. 한편 고실성형술은, 이식편이 외기도 전방 골부의 내측 혹은 외측에 위치하는가에 따라, 내면이식법과 외면이식법으로 나뉜다. 외면이식법은 특히 전방의 고막 천공과 고실륜 사이에 잔존 고막이 많지 않은 경우 재천공을 예방하기 위해 고려되나, 고막의 외측화라는 단점이 있다. 하지만 현미경을 이용한 수술에서 두 방법의 결과에는 큰 차이가 없으며, 단지 술자의 선호에 따라 선택된다는 연구도 있다. 본 연구를 통해 내시경을 이용한 고실성형술에서 위의 두 가지 방법을 적용하였을 때, 수술 과정과 결과에 차이가 있는지 알아보려고 하였다. **방법:** 2016.6부터 2019.5까지 한 명의 술자에 의해 시행된 내시경을 이용한 경외기도 1형 고실성형술을 받은 31명을 대상으로 하였다. 이 중 외면이식이 11례, 내면이식이 20례에서 시행되었다. 남

너비는 각각 4:7, 7:13이었다. 환 자의 평 균 연령은 각각 51.8세와 54.1세 였으며, 수술 전 천공 크기의 평균 은 각각 31.4%와 25%였다. 수술 전 기도 청력 평균은 각각 31.1dB HL과 36.3dB HL이였 다. **결과:** 수술 시간은 평균 68.6분과 64.9분으로 외면이식의 경우에 평균 4분가량 더 소요되었으나 통계적으로 유의한 차이는 없었다( $P>0.05$ ). 수술 후 청력 개선 은 각각 9.8 dB과 12.2 dB로 차이를 보이지 않았다( $P>0.05$ ). 재천공은 각각 9%, 15%에서 관찰되었으며, 모두 미세 천공이었고 이루는 없었다. 모든 환자 에서 특이할 만한 합병증은 관찰되지 않았다. **결론:** 내시경을 이용한 경외이도 고실 성형술에서 외면이식과 내면이식을 모 두 성 공적으로 시행할 수 있었으며 수술 시간의 차이는 크지 않았다. 수술 후 결 과도 차이를 보이지 않았다. 따라서 내시경을 이용한 경외이도 고실 성 형술 에서 천공의 위치나 술 자의 선호에 따라 외면이식과 내면이식을 선택 할 수 있을 것으로 생각된다.

#### OTOP-18 11:20~11:30

### EFFECT OF ALLERGIC RHINITIS ON PROGRESSION AND RECOVERY OF OTITIS MEDIA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, DONGGUK UNIVERSITY ILSAN HOSPITAL, SENSORY ORGAN RESEARCH INSTITUTE, COLLEGE OF MEDICINE, DONGGUK UNIVERSITY

YOUN WOO KIM, BO HAE KIM, YUN-SUNG LIM, SEOK-WON PARK, CHANG GUN CHO, JOO HYUN PARK

**목적:** To evaluate the effect of allergic rhinitis (AR) on development, progression and recovery of acute OM in an animal model, and investigated the secondary effect of bacterial infection. **방법:** BALB/c mice were divided into four groups: AR-OM, AR, OM, and control groups. AR-OM and AR groups were sensitized with ovalbumin (OVA) and alum and then challenged intranasally with OVA. OM was induced by surgical inoculation of non-typeable *Haemophilus*

influenza (NTHi) into the middle ear (ME) cavity in AR-OM and OM groups. Each group was subdivided into sets of 6 mice, one for each of the four time points (0, 2, 7, and 10 days post-bacterial inoculation), at which point the mice were euthanized and ME and nasal cavity mucosa were obtained. The occurrence of OM in each group and the ME mucosa thickness were evaluated and compared them among four groups. Tissue expression of interleukin(IL)- $\beta$ , IL-6, and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) in infected ME mucosa was assessed by immunohistochemical staining. We also investigated the IgE, IL-4 and IL-5 in the nasal mucosa. **결과:** All ears showed OM on post-inoculation day 2 in both AR-OM and OM groups. 67% of AR-OM group still had OM on post-inoculation day 10, while only 10% of OM group had OM in OM group. ME mucosa of all groups increased and AR-OM group exhibited the thickest mucosa. OM group showed peak thickness on post-inoculation day 2 and decreased, whereas ME mucosa thickness of AR-OM group increased more on day 7 in AR-OM groups. Expression of proinflammatory cytokines (IL-1 $\beta$ , IL-6, and TNF- $\alpha$ ) in the ME also increased significantly and showed their peak on post-inoculation day 2, and gradually decreased in OM group. In AR-OM group, they increased until day 7 and exhibited higher value and decreased slowly than OM group. IgE and Th2 response (IL-4 and IL-5) cytokines were expressed at higher levels in the AR-OM group than in AR group. **결론:** The inflammatory reaction to NTHi was more intense and lasted longer in the allergic group, which indicates that AR affect the progression and subsequent recovery of acute bacterial OM. Bacterial OM in allergic subjects can be developed more severe and resolved more slowly.

## OTOP 4

내이질환

11:30~12:30 • 세미나실2

Chairperson(s) : 백무진(인제대의), 박시내(가톨릭대의)

**OTOP-19 11:30~11:40**

### LOUDNESS DISCOMFORT LEVEL AS A TEST FOR HYPERACUSIS: TEST-RETEST RELIABILITY AND ITS CLINICAL VALUE

DEPARTMENT OF OTORHINOLARYNGOLOGY- HEAD & NECK SURGERY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

JACLYN LEIGH VIDAL, JUNG MEE PARK, JAE SANG HAN, HAMZAH AL SHAIKH, SHI NAE PARK

**목적:** To investigate the test-retest reliability of loudness discomfort levels (LDLs) and to evaluate its clinical value as a test method for hyperacusis. **방법:** For the test-retest reliability of LDLs (study 1), a total of 68 patients who had tinnitus with or without hyperacusis were enrolled and subgrouped into 3 groups; patients with tinnitus (group 1), patients with tinnitus and hearing loss (group 2), and patients with hyperacusis (group 3). Their LDLs measured with pure tone and white band noise were compared with normal controls to suggest the cut-off point for hyperacusis. Inter-hour and inter-day test-retest reliability using different stimuli were also investigated. For study 2, the clinical value of the LDLs using pure tone stimuli were analyzed by comparing the changes before and after sound generator use in 42 patients with hyperacusis. **결과:** For study 1, group 3 patients showed significantly lower LDLs compared to the other groups. High test-retest reliability of LDL tests has also been demonstrated, regardless of the type of stimulus used

for the test. The cut-off values for screening the patients with hyperacusis were 90 dBHL for the pure tone stimuli and 62dBHL for white band noise stimuli. For study 2, significantly increased LDLs correlated with improved hyperacusis symptoms were observed after sound generator use, indicating that LDLs may be a valuable test to screen and reflect the condition of hyperacusis during the course of therapy. **결론:** Measurement of LDLs seems to be clinically valuable for screening hyperacusis as well as reflecting the changes in hyperacusis, considering its high test-retest reliability and correlation with subjective symptoms.

**OTOP-20 11:40~11:50**

### INFLUENCE OF TINNITUS ON SOUND LEVEL TOLERANCE IN UNILATERAL TINNITUS SUBJECTS WITH NORMAL AUDIOGRAM

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, EULJI MEDICAL CENTER, EULJI UNIVERSITY SCHOOL OF MEDICINE, SEOUL, KOREA

YONG TAE CHO, DONG HYUK JANG, YONG-HWI AN, HYUN JOON SHIM

**목적:** Several studies have demonstrated that tinnitus subjects show significantly reduced sound level tolerance compared with control subjects, but they did not separate into groups with unilateral and bilateral tinnitus in the analyses. To investigate the influence of tinnitus on sound level tolerance, we compared uncomfortable loudness level (UCL) among tinnitus ears (TEs) and non-tinnitus ears (NTEs) of unilateral tinnitus subjects and control ears of normal subjects. Moreover, we compared UCL between tinnitus subjects who complained hyperacusis and those who did not. **방법:** Human subjects included 50 unilateral tinnitus subjects (12 males and 38 females) with normal and symmetric hearing thresholds and 64 control subjects. We conducted psychoacoustic mea-

surements of UCLs with 500 Hz and 3000 Hz pure tones in each ear separately. **결과:** There were no significant differences of UCLs at 500Hz and 3000Hz of between TEs and NTEs, but the UCLs at 500Hz and 3000Hz of both TEs and NTEs were lower than those of the control ears. No significant differences of UCLs at 500Hz and 3000Hz were found between tinnitus subjects with hyperacusis and without hyperacusis. The UCL of 500Hz had significantly negative correlation with the duration of tinnitus and subjective tinnitus loudness. **결론:** These results support the existing hypothesis that tinnitus and hyperacusis are commonly caused by an increase of central gain. Reduced sound level tolerance in not only TEs but also NTEs might imply that the increased central gain affects bilaterally in consequence of loudness balance mechanism by lateral olivocochlear efferents.

#### OTOP-21 11:50~12:00

### ROLE OF ENDOLYMPHATIC SAC DECOMPRESSION AS DISEASE MODIFYING EFFECT IN INTRACTABLE MENIERE DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY COLLEGE OF MEDICINE

JI-SOO LEE, JUN-YOUNG LEE, HYUNG-JONG KIM, HYU-JEONG LEE, SUNG-KWANG HONG

**목적:** To verify whether endolymphatic sac decompression (ELSD) would play a role as disease modifying therapy in intractable Meniere disease as compared another treatment protocol or medical treatment only patients. **방법:** This study included 76 patients with intractable Meniere disease (MD) were diagnosed according to AAO-HNS criteria who had followed up minimum 2 years after invasive treatment including ELSD, intratympanic injection and medical therapy only. Among them, ELSD surgery was car-

ried out in 28 patients, clinical parameters of whom was compared to another groups by propensity score matching. Clinical parameters collected from audio, ECOG, VEMP, Caloric test, vHIT (if it was available) and subjective questionnaire including functional level scale at predetermined schedule **결과:** Among those who were performed ELSD, 11 patients (39.2 %) only revealed class A, indicating complete remission based on AAO-HNS criteria, while 8 patients (28%) consistently showed recurrent vertigo attack after ELSD, in which, 6 patients treated with ITGM and vestibular neurectomy carried out in 2 patient. Even all subject of ELSD revealed intermediate improvement of functional level scale after ELSD, our data did not show long term significant benefit in clinical course. In addition, ELSD failed to show a disease modifying effect in intractable MD compared to groups with another treatment protocol. **결론:** Our results did not show ELSD provide disease modifying effect in intractable MD. Even though ELSD should be considered in intractable MD patient with serviceable hearing, it would be doubtful whether ELSD provide long term clinical benefit.

#### OTOP-22 12:00~12:10

### THE EARPHONE USE AND AUDIOLOGIC AND PSYCHOLOGIC FACTORS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHA UNIVERSITY COLLEGE OF MEDICINE

JAY CHOI, CHEONGSE WON, TAE HYUN SHIN, SUNG SU PARK, SO YOUNG KIM, CHANG HO LEE

**목적:** This study was aimed to investigate the association of earphone use with audiological and psychologic factors. **방법:** The  $\geq 12$  years old participant were collected from the Korea National Health and Nutrition Examination Survey (KNHANES), 2009-2012. Participants with earphone use  $\geq 1$  hours/ day

were matched with control group for age, sex, income, and education levels. The relation between earphone use and the hearing thresholds of pure tone audiometry, tinnitus, and psychologic factors of depression, anxiety, and quality of life were analyzed using multiple logistic regression tests with complex sampling. **결과:** The 22.9% (449/1,955) of earphone use group and the 18.1% (355/1,600) of control group had tinnitus ( $P < 0.001$ ). The earphone group showed 1.33 fold higher odds for tinnitus (95% confidence intervals [CI] = 1.13 – 1.56,  $P < 0.001$ ). The 6.5% (128/1,955) of earphone use group and the 5.0% (97/1,600) of control group had anxiety and depressive symptoms ( $P = 0.033$ ). The earphone group showed 1.34 fold higher odds for anxiety and depressive symptoms (95% CI = 1.01 – 1.78,  $P = 0.039$ ). The hearing thresholds were comparable between earphone and control groups. **결론:** The earphone use was associated with tinnitus and anxiety or depressive symptoms.

**OTOP-23 12:10~12:20****GENETIC CHARACTERISTICS AND AUDIOLOGICAL PERFORMANCE IN PATIENTS WITH INCOMPLETE PARTITION TYPE III**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

SE A LEE, JAE YOUNG CHOI, JINSEI JUNG

**목적:** To analyze genetic characteristics and surgical outcomes of cochlear implantation in patients with incomplete partition (IP) type III **방법:** From January 2005 to June 2019, 11 patients were diagnosed with incomplete partition (IP) type III based on the radiologic findings of abnormal dilation of the internal acoustic canal and underdeveloped modiolus. Genetic testing was performed by coding region sequencing or multiplex ligation-dependent probe amplification

(MLPA) of POU3f4 gene. Cochlear implantation was performed in patients with severe to profound hearing loss. **결과:** Among 11 patients with IP type III, 9 patients had genetic testing. Six patients had pathogenic variants in coding region of POU3f4 including 2 novel nonsense variants (c.446delG and c. 975delG), whereas 3 patients had genomic deletion in the POU3F4 locus. All the patients showed severe to profound hearing loss and 5 patients among them had cochlear implantation. CSF gusher was surgically identified in all cases. The postoperative cochlear auditory performance score ranged from 2 to 6 presenting higher score with a long-term follow up. **결론:** Direct Sanger sequencing as well as MLPA analysis in POU3F4 are sequentially recommended in patients with IP type III. Surgical outcome of cochlear implantation in DFNX2 are comparable to that in patients with no cochlea anomaly.

**OTOP-24 12:20~12:30****AUDITORY BRAINSTEM RESPONSE TEST RESULTS IN NORMAL HEARING ADOLESCENT PATIENTS WITH TINNITUS**

DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY COLLEGE OF MEDICINE

MUN SOO HAN, YONG JUN JEONG, MIN KYU LEE, SEONGBIN PARK, YOUNG-SOO CHANG, YOON CHAN RAH, JUNE CHOI

**목적:** The pathogenesis of subjective tinnitus is not yet to be clearly established. It is often associated with hearing loss, but also appears in patients with normal hearing; affecting adolescents as well as elderlies. Meanwhile, auditory brainstem response (ABR) test objectively evaluates cochlea and brainstem auditory pathways. And several characteristics of ABR results in tinnitus patients with normal hearing have been suggested. This study aimed to evaluate ABR features

of adolescent tinnitus patients with normal hearing thresholds in comparison to those of adults. **방법:** The study population consisted of 13 adolescent patients as study group and 115 adult patients as control group. We selected patients with subjective tinnitus and normal hearing, who visited Otorhinolaryngology clinic in Korea University Ansan Hospital from Jan 2016 to Dec 2017. Patients were tested with pure tone audiometry, tinnitus test and auditory brainstem response test. For ABR, latency and amplitude of wave I, III and V, interpeak latency between wave I-III, III-V and I-V, and interaural latency difference were measured and compared between adolescents and adults. **결과:** Average of wave I amplitude among 18 affected ears of adolescents (5 bilateral tinnitus patients) was  $0.33\mu\text{V}$ , and  $0.51\mu\text{V}$  for wave V amplitude, compared to  $0.25\mu\text{V}$  and  $0.38\mu\text{V}$  for 175 adult ears (60 bilateral tinnitus patients). Latency averages were 1.46ms for wave I, 3.65ms for wave III, and 5.46ms for wave V in adolescents compared to 1.43ms, 3.64ms and 5.52ms in adults. **결론:** From the study, we sought to find ABR characteristics among normal hearing tinnitus children. Further evaluation and data collection could lead to further understanding of pathophysiology of tinnitus among adolescents.

## OTOP 5

중이질환 I

13:30~14:30 • 세미나실2

Chairperson(s) : 최영석(충북의대), 박홍주(울산의대)

OTOP-25 13:30~13:40

### ASSOCIATIONS BETWEEN PARTICULATE MATTER AND OTITIS MEDIA IN CHILDREN A META-ANALY-

## SIS

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SANG-YOUP LEE<sup>1</sup>, MYOUNG-JIN JANG<sup>2</sup>, MYUNG-WHAN SUH<sup>3,4</sup>, JUN HO LEE<sup>3,4</sup>, SEUNG HA OH<sup>3,4</sup>, MOO KYUN PARK<sup>3,4,\*</sup>

**목적:** Otitis media (OM) is one of the most common otologic diseases in younger children. There is a general consensus that OM development is influenced by air pollution. Particulate matter (PM) is a main component of air pollutants. However, study results about the relationship between OM and PM are inconsistent. We attempted to investigate the relationship clearly through this meta-analysis. **방법:** We systematically searched PubMed, EMBASE, and The Cochrane Library for observational studies of OM and PM from the time of their inception to March 31, 2019. Twelve articles were selected and analyzed about the association between PM and OM. In addition, risk factors for OM were examined on the basis of the pooled relative risks (RRs) by random-effect and fixed-effect models. **결과:** The pooled RRs each of  $10\ \mu\text{g}/\text{m}^3$  increments for  $\text{PM}_{2.5}$  and  $\text{PM}_{10}$  were 1.032 (95% CI, 1.005–1.060) and 1.010 (95% CI, 1.008–1.012), respectively. The pooled RRs were statistically significant within a short time span (1 week), which were 1.024 (95% CI, 1.008–1.040) and 1.010 (95% CI, 1.008–1.012) for  $\text{PM}_{2.5}$  and  $\text{PM}_{10}$ , respectively. They were also statistically significant for children aged <2 years, which were 1.426 (95% CI, 1.278–1.5191) for

PM<sub>2.5</sub> and 0.010 (95% CI, 1.008–1.012) for PM<sub>10</sub>. **결론:** The results of this study suggest that OM incidence may be positively correlated with both PM<sub>2.5</sub> and PM<sub>10</sub> increments with the former more closely related to OM incidence, especially in younger children exposed during a short time span.

#### OTOP-26 13:40~13:50

### AUDIOLOGIC AND POSTOPERATIVE CHANGE IN PATIENTS WITH CHRONIC OTITIS MEDIA AFTER EUSTACHIAN TUBE BALLOON DILATATION

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, KOREA

YEONJOO CHOI, MIN YOUNG KWAK, YEHREE KIM, JIN TAEK PARK, WOO SEOK KANG, JOONG HO AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** The most reliable pathophysiology for chronic otitis media(COM) is persistent eustachian tube(ET) dysfunction. Thus, mechanical dilatation of ET has been widely performed, and the results are plausible so far. The aim of this study is to identify the audiologic and postoperative changes for COM patients who underwent tympano-mastoidectomy with ET balloon dilatation. **방법:** The study was retrospectively reviewed the medical records of patients who were diagnosed with COM and ET dysfunction and underwent tympano-mastoidectomy in a Asan medical center from 2016 to 2017. The tympanic membrane(TM) status, the presence of ventilation tube, ability to perform a Valsalva maneuver, and audiologic changes by dilatation of ET were observed. **결과:** Twenty-one ears with 20 patients aged from 31 to 71 year-old were enrolled (F:M=13:8, right:left=11:10). Before ET balloon dilatation, ventilation tube were already inserted in 17 ears(81.0%), TM was perforated in 4 ears(19.1%). At 3 months after balloon dilatation,

11 ears(52.4%) presented intact TM, while ventilation tube was still placed in 8(38.10%) and TM was perforated in 2(9.5%). Before the ET balloon dilatation, none of the patients were capable of Valsalva maneuver. However, 13 ears(61.9%) were able to perform a Valsalva maneuver at 3 months after balloon dilatation. Among 13 ears, 10 ears(76.9%) presented intact TM. However, only 1 ear(12.5%) among the incapable Valsalva group represented intact TM. Insertion of ventilation tube showed audiologic improvement of  $3.8 \pm 7.9$ dB. Successful Valsalva group after ET balloon dilation showed audiologic improvement of  $4.7 \pm 10.8$ dB, while unsuccessful Valsalva group showed audiologic improvement of  $3.3 \pm 9.4$ dB. **결론:** A Valsalva maneuver could be performed successfully in 62% after the ET balloon dilatation in patients with COM. With consequences of successful ET balloon dilatation, there were more chances to have intact TM without necessity of ventilation tube and an ability to perform a Valsalva maneuver.

#### OTOP-27 13:50~14:00

### THE PREVALENCE OF EUSTACHIAN TUBE DYSFUNCTION IN CHRONIC OTITIS MEDIA: ITS INFLUENCE ON POSTOPERATIVE AIR-BONE GAP

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

HYE AH JOO, YEHREE KIM, MIN YOUNG KWAK, JIN TAEK PARK, WOO SEOK KANG, JOONG HO AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** Currently, Eustachian tube (ET) dysfunction can be managed with a new therapeutic approach, balloon tuboplasty. We aimed to investigate the prevalence of ET dysfunction in postoperative follow-up in patients with chronic otitis media (COM) and its influence on

postoperative air-bone gap (ABG). **방법:** We retrospectively reviewed the medical records of 50 COM patients who underwent tympanomastoid surgery at Asan Medical Center from August 2018 to May 2019. At 1 month postoperatively, ET function was evaluated with Valsalva maneuver. If a Valsalva maneuver was not successful, the patient was followed up in 3 weeks to check ET function again. If the patient still could not perform the Valsalva maneuver successfully, ventilating tube (VT) was inserted. ABG on postop 1 month was compared using Mann-Whitney test. **결과:** The prevalence of postop unsuccessful Valsalva at 1 month was 30% (15 out of 50) and 16% (8 out of 50) at 2 months. Unsuccessful Valsalva group had larger ABG ( $28.1 \pm 12.5$  dB) than that ( $15.6 \pm 8.2$  dB) of the successful Valsalva group on postoperative 1 month ( $P < 0.001$ ). Of the 15 ET dysfunction patients 11 patients were followed up 3 weeks later. Four (36%) patients showed decreased ABG with successful Valsalva. Seven patients received VT insertion. However, in those patients, ABG still remained after VT. **결론:** The prevalence of Eustachian tube dysfunction was 30% in patients with chronic otitis media who underwent tympanomastoid surgery and ET function needs to be carefully monitored in those patients and ET balloon dilation can be a promising therapeutic method for these patients.

#### OTOP-28 14:00~14:10

### ENDOSCOPIC TYMPANOPLASTY: IS THERE A DIFFERENCE BY DIFFERENT INSERTION TECHNIQUES?

DEPARTMENT OF OTORHINOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN, COLLEGE OF MEDICINE

DONG KYU LEE, JONG WOO CHUNG

ciency of endoscopic ear surgery has been recognized. Chronic otitis media with tympanic membrane perforation is a great indication of endoscopic tympanoplasty. There are two methods of graft insertion techniques in endoscopic tympanoplasty. At first, graft was insertion after transcanal incision and tympanomeatal flap elevation. The other one is graft insertion through tympanic membrane perforation without transcanal incision. In this study, we evaluate and compare the results of two different insertion techniques. **방법:** This study enrolled 75 ears which underwent endoscopic tympanoplasty in single center (Asan medical center, Seoul, Korea), by single surgeon (Dr. JW Chung), from July 2017 to July 2019. Retrospective review was done for graft success or fail, pre & postoperative pure tone audiometry results, and operation time. Independent-sample t-test was used to compare the results between each insertion techniques. **결과:** In total 75 cases, 56 cases underwent transcanal incision and tympanomeatal flap elevation (Group A), and 19 cases underwent tympanoplasty through perforation (Group B). Graft success rate was 75% and 78% respectively, but it is not statistically significant. (P-value 0.73). In group A, Air-Bone gap decreased about 3.06dB after surgery. Otherwise in group B, Air-bone gap decreased about 1.93dB, but it isn't statistically significant neither. (P-value 0.54). In the aspect of operation time. Group B (60.4min) seems to take much shorter operation time than group A (72.8min). (P-value 0.69) **결론:** In conclusion, our study demonstrated that surgical outcomes were not different between two groups. In addition, group B took shorter operation time than group A. So, we suggest that Endoscopic tympanoplasty via tympanic perforation can be replace transcanal incision and tympanomeatal flap elevation, as a minimal invasive surgery.

**목적:** With developing endoscopic techniques, the effi-



## OTOP-29 14:10~14:20

**CLINICAL EFFICACY OF FAT MYRINGOPLASTY FOR PERFORATIONS OF DIFFERENT SIZES AND LOCATIONS**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL AND CHONNAM NATIONAL UNIVERSITY HOSPITAL  
HONG-CHAN KIM, YONG BEOM CHO, HYONG-HO CHO, CHUL HO JANG

**목적:** 고막 천공의 수술적 복원술인 고막성형술에서 이식물은 주로 측두근 근막, 연골막, 지방 등이 사용된다. 지방을 이용한 고막성형술은 이식물 획득이 쉽고 중이 구조에 대한 수술적 조작이 거의 없어 otologic trauma 의 가능성이 적으며 수술시간이 짧다. 이에 저자들은 천공을 동반한 만성 중이염 환자에서 천공의 크기 및 위치에 따른 지방 고막성형술의 성공률을 비교, 분석하고자 한다. **방법:** 본원에서 2015년 3월부터 2019년 3월까지 천공을 동반한 만성중이염으로 지방 고막성형술을 받은 164명의 환자를 대상으로 성별, 나이, 술 전 청력, 천공의 크기, 천공의 위치, 수술 후 성공률 등을 분석하였다. **결과:** 천공의 크기는 10% 이하(32명), 10~25%(88명), 25~50%(30명), 50%이상(14명)으로 4개로 분류되었으며 각각 성공률은 90.6%, 90.9%, 86.7%, 71.4% 를 보였다. 25%이하 천공 환자에서 천공의 위치는 anterior(102명), posterior(18명)이며 수술성공률은 90.2%, 94.4% 로 나타났다. 25~50% 천공 환자에서 천공의 위치는 anterior(15명), posterior(3명), inferior(12명)이며 수술 성공률은 93.3%, 100%, 75% 를 보였다. **결론:** 25%이하의 천공의 경우 크기 및 위치에 따른 수술 성공률에 차이가 없었다. 25~50% 천공의 경우 inferior 위치의 경우에 수술 성공률이 낮았다. 50% 이상의 천공의 경우 수술 성공률이 다른 크기 군에 비해 낮은 성공률을 보였다.

**SCOPIC ATTICOPLASTY FOR ATTIC CHOLESTEATOMA**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL AND CHONNAM NATIONAL UNIVERSITY HOSPITAL  
HONG-CHAN KIM, YONG BEOM CHO, HYONG-HO CHO\*

**목적:** 상고실 진주종에 대한 전통적인 치료법은 수술현미경을 이용한 수술 방법으로 수술 현미경이 가진 시야의 제한 때문에 병변의 정도가 심하지 않는 경우를 제외하고는 주로 유양돌기 삭개술과 함께 시행하게 된다. 내시경은 시야의 제한을 가지고있는 수술현미경과 달리 외이도 안에서 다양한 각도의 내시경을 상용함으로써 병변을 보다 자세하게 보면서 수술을 진행할 수 있다. 이에 저자들은 상고실 진주종에 대한 내시경을 이용한 최소 침습적 수술의 효용성 및 초기 치료 결과 등을 알아보하고자 하였다. **방법:** 본원에서 2015년 3월부터 2019년 3월까지 상고실 진주종으로 진단된 후에 내시경을 수술을 받은 41명의 환자 증례를 대상으로 의무기록, 방사선학적 검사 등을 후향적으로 조사하였으며 성별, 나이, 술 전-술 후 청력검사, 수술 후 합병증, 수술 후 치료 결과 등을 분석하였다. **결과:** 술 전 골도 청력, 기도 청력, 골도-기도 청력차는 17.7dB, 30.8dB, 13.2dB 이며 술 후 청력은 16.9dB, 28.4dB, 11.6dB 로 수술로 인한 청력의 유의한 차이는 없었다. 상고실 진주종에 대해 1st 수술을 시행한 환자 35명 중 32명은 이소골을 보존할 수 있었지만 3명의 경우 병변 제거를 위하여 이소골을 제거하였다. 수술 후 외래 경과 관찰 중 삼출성 중이염은 5명, 상고실 전방 함몰은 5명에서 발생하였으며 1명의 경우에 진주종이 재발하여 유양돌기 삭개술을 시행하였다. **결론:** 유양동 내로 진행하지 않은 상고실 진주종에서 내시경 수술이 이소골 보존 및 진주종 제거에 효과적인 수술방법이라 생각한다.

## OTOP-30 14:20~14:30

**SURGICAL RESULTS OF TRANSCANAL ENDO-**

## OTOP 6

### 중이질환 II

14:30~15:30 • 세미나실2

Chairperson(s) : 조용범(전남의대), 이종대(순천향의대)

### OTOP-31 14:30~14:40

#### SURGICAL OUTCOMES OF ATTIC CHOLESTEATOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, KOREA

JOONG BO SHIN, MIN BUM KIM, JONG SEI KIM, YOUNG SANG CHO, SEEUN SON, WON-HO CHUNG

**목적:** The aim of this study is to compared the outcomes between surgery types and the extension of attic cholesteatoma. **방법:** We retrospectively reviewed the medical records and temporal bone computed tomography of the patients who underwent surgery for removing attic cholesteatoma. Mastoid surgeries are categorized as canal wall up (CWU, n=56), canal wall down (CWD, n=16) and no mastoid surgery (n=22) and the type of tympanoplasty was classified as type 0 (n=10), type 1 (n=11) tympanoplasty, partial ossicular replacement (POR, n=66) and total ossicular replacement (TOR, n=7). **결과:** Ninety four patients were enrolled in this study. Average postoperative follow-up period was 30 months( 1 – 184 months). Preoperative hearing was  $39.03 \pm 17.21$  dB in air conduction and  $18.91 \pm 11.02$  in air bone gap. Excluding the cases of tympanization, postoperative hearing was  $33.92 \pm 14.63$  dB in air conduction and  $15.27 \pm 10.66$  in air bone gap. The postoperative hearing outcomes were  $32.25 \pm 16.52$  dB for mastoid preservation group,  $32.68 \pm 13.94$  dB for CWU group and  $41.88 \pm 13.30$

dB for CWD group in air conduction. And,  $13.43 \pm 13.12$  for mastoid preservation group,  $14.80 \pm 10.14$  for CWU group and  $18.96 \pm 6.95$  for CWD group in air-bone gap. There was no significant difference between mastoid surgery categories. The postoperative residual/recurrent disease occurred in 11 cases (11.7%). Recurrence was occurred in 3 cases with mastoid preservation and 8 cases with CWU surgery. No patient with CWD surgery was recurred. There also was no difference of rates of recurrence or tympanic membrane retraction between surgery types. **결론:** Surgical outcomes such as hearing results and recidivism in attic cholesteatoma were similar regardless of the types of surgery and extent of disease. Therefore, the choice of surgical types was the most important factor to gain better surgical results. attic cholesteatoma

### OTOP-32 14:40~14:50

#### HEALING ACCELERATION OF MASTOIDECTOMY THROUGH THE EXTERNAL AUDITORY CANAL INCISIONLESS APPROACH

DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY, CHUCHEON SACRED HEART HOSPITAL, HALLYM UNIVERSITY MEDICAL CENTER, CHUNCHEON, REPUBLIC OF KOREA,

JUN HO LEE

**목적:** To evaluate a surgical procedure of canal wall-up mastoidectomy without incision of the canal which enables accelerated healing and enhances hearing outcome. **방법:** A total of 79 patients were enrolled. A canal-incisionless technique was used in 37 patients undergoing canal wall-up/down mastoidectomy (CWU/DM), explo-mastoidectomy, and cochlea implantation as staged operation after obliteration of the mastoid, and canal incision was used in the remaining 42 patients as comparison group. **결과:** Preoperative and postoperative pure tone audiometry/word

recognition score and postoperative status including the healing time and complications were analyzed. Healing time of the canal-incisionless procedure (2.7 weeks) was shorter than that of conventional mastoidectomy with canal incision (5.7 weeks). Complication rate of the canal-incisionless procedure was lower than that of canal incision approach, even though statistical meaningless. **결론:** Despite the small sample size of our study, in patients undergoing CWDM, ex-plo-mastoidectomy, and cochlea implantation, more acceptable healing was achieved using the canal-incisionless technique than with the canal incision technique. CWU/DM without canal incision is useful to achieve optimal surgical view, eliminate pathology of the middle ear, and accelerate healing time.

### OTOP-33 14:50~15:00

#### EXPRESSION OF ENDOPLASMIC RETICULUM STRESS-RELATED MRNAS IN CHRONIC OTITIS MEDIA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

SUNG HWA DONG, MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** Unfolded proteins in the endoplasmic reticulum (ER) cause an ER stress response and can result in various pathologic conditions, including inflammation. Otitis media is the most common disease in otolaryngology and is associated with inflammation. The pathophysiology of chronic otitis media is not well understood; we therefore investigated the expression pattern of ER stress-related mRNAs in chronic otitis media. **방법:** Specimens were obtained from 47 patients with chronic otitis media over a period of 2 years. Expression levels of 6 ER stress transcription

factors were quantitatively assessed using real-time RT-PCR. **결과:** The mRNA expression of sXBP1 was significantly higher in the otorrhea present group than in the otorrhea absent group ( $p < 0.05$ ). ATF6 expression was significantly higher in the ossicle destruction group than in the ossicle intact group ( $p < 0.05$ ). mRNA expression of the 6 ER stress-related genes did not differ significantly between those patients with positive microbial cultures versus those with negative cultures ( $p > 0.05$ ) or those with facial nerve dehiscence versus those without facial nerve dehiscence ( $p > 0.05$ ). **결론:** sXBP1 appears to be involved in chronic otitis media-associated inflammation, including otorrhea. ATF6 is associated with the destruction of ossicles. Our results suggest that certain ER stress-related genes are expressed in chronic otitis media-associated inflammation.

### OTOP-34 15:00~15:10

#### CLINICAL MANIFESTATION AND POSTOPERATIVE RESULTS OF VENTILATING TUBE INSERTION ACCORDING TO THE DEGREE OF OTITIS MEDIA WITH EFFUSION

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<sup>6</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD

AND NECK SURGERY, EULJI MEDICAL CENTER, EULJI UNIVERSITY SCHOOL OF MEDICINE, SEOUL, KOREA  
<sup>7</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, GANGNAM SEVERANCE HOSPITAL, YONSEI UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA <sup>8</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, KYUNGPOOK NATIONAL UNIVERSITY CHILGOK HOSPITAL, DAEGU, KOREA

CHOL HO SHIN<sup>1</sup>, YUN SUK AN<sup>2</sup>, BYUNG CHUL KANG<sup>3</sup>, TAE SU KIM<sup>4</sup>, HYUN WOO LIM<sup>5</sup>, HYUN JOON SHIM<sup>6</sup>, CHAN IL SONG<sup>7</sup>, MYUNG HOON YOO<sup>8</sup>, JOONG HO AHN<sup>1</sup>

**목적:** We performed multicenter study to analyze clinical manifestation and postoperative results of otitis media with effusion (OME) according to the degree of effusion. **방법:** From Jan 2015 to Dec 2017, a total 406 patients (256 males and 150 females) from 7 hospitals in Korea were enrolled in this study. We classified 812 ears into 6 groups: grade 0 (no effusion), grade I (very little effusion), grade II (effusion less than half of tympanic cavity), grade III (effusion over half of tympanic cavity with bubbles), grade IV (full effusion without bubbles), and grade V (deformed tympanic membrane or hemotympanum). We retrospectively reviewed medical and operation records of patients who received ventilating tube insertion (VTI). After VTI, we followed up the patients at least 12 months (24.2 ± 10.8 months). **결과:** Mean age at VTI was 4.9 ± 2.5 years and mean duration between diagnosis and operation was 4.1 ± 1.4 months. There were no significant differences in sex, site of effusion, history of OME, preoperative duration, and age at VTI among 6 OME groups. However, from grade 0 group to grade V group, the proportion of female, glue and OME recurrence increased significantly ( $P < 0.05$ ). In addition, the percentage without VTI and duration of ventilating tube significantly decreased as going to grade 0 group ( $P < 0.05$ ). **결론:** From this study, we hope that this new grading system of OME might be helpful for clinicians to make better therapeutic plan and for pa-

tients to deep understand its future progress.

**OTOP-35 15:10~15:20**

**DO SYSTEMIC AND INTRATYMPANIC APPLICATION OF VANCOMYCIN FOR CHRONIC OTITIS MEDIA WITH MRSA INFECTION INCREASE OTOTOXICITY?**

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

PILKEUN JANG, YOON JUNG KIM, SANG YEON LEE, JAE-JIN SONG, BYUNG YOON CHOI, JA-WON KOO

**목적:** Ototoxicity is a major adverse effect of aminoglycosides limiting their usage in clinical practice. With increasing incidence of MRSA infection, prescription of vancomycin is also increasing. However, the ototoxicity of vancomycin is rarely documented. One recent article claimed the risk of vancomycin ototoxicity significantly increases in some ages. For those patients of intractable otorrhea due to chronic otitis media (COM) with MRSA infection, authors have been using systemic vancomycin during perioperative period for 6 days and also vancomycin mixed-soaking solution for middle and external ear packing. The aim of this study is to review if systemic and intratympanic application of vancomycin increase ototoxicity in patients of COM with MRSA infection. **방법:** A retrospective analysis of 99 patients who underwent surgery for COM with MRSA infection between January 2014 and June 2018 was performed. The patients who administrated systemic and intratympanic vancomycin were included. The patients who had labyrinthine fistula and allergy to vancomycin were excluded. **결과:** In postop 1 day, bone conduction (BC) threshold increased for 2kHz (5.76dB,  $p=0.000$ ), 3kHz (4.24dB,  $p=0.000$ ) and 4kHz (2.98dB,  $p=0.008$ ). In postop 6 weeks, it also increased for 2kHz (2.48dB,  $p=0.017$ ),

3kHz (2.42dB,  $p=0.011$ ) and 4kHz (3.48dB,  $p=0.000$ ). BC threshold of postop 6 weeks was decreased for 1kHz(-1.77dB,  $p=0.029$ ), and 2kHz (-3.28dB,  $p=0.001$ ) in comparison with the threshold of postop 1 day. **결론:** BC threshold increased postoperatively in some frequencies. However, the maximum value of the mean difference between preop and postop threshold was 5.76dB. Up to 10dB is considered as an acceptable margin of error, so the result could be interpreted that it is not clinically significant. Also, the difference between postop 1 day and 6 weeks is not clinically significant. In conclusion, systemic and intratympanic application of vancomycin for COM with MRSA infection do not increase ototoxicity.

#### OTOP-36 15:20~15:30

### SURGICAL OUTCOME OF CHRONIC OTITIS MEDIA IN ELDERLY PATIENTS

DEPARTMENT OF OTORHINOLARYNGOLOGYHEAD AND NECK SURGERY, ULSAN UNIVERSITY HOSPITAL, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, ULSAN

JIN IL KIM, TAE KOON KIM, TAE-UK CHEON, JOONG KEUN KWON, BYUNG CHUL KANG

**목적:** In the elderly population, chronic otitis media (COM) reduce quality of life because of recurrent otorrhea and additional hearing loss. But surgical treatment is not actively performed due to general health conditions and risks. In this study, we investigated the surgical outcome of COM surgery in elderly patients older than 70 years. **방법:** We retrospectively reviewed the medical records of patients older than 70 years who underwent surgery for COM at Ulsan University Hospital for 10 years from 2009 to 2019. Surgical approach, anesthesia type, time of operation, graft success rate, hearing outcomes and complications were evaluated. **결과:** We enrolled 72 ears of 61 patients, including 8 bilateral cases and 3 revision cases

in the same ears. The mean follow-up period was 16 months. Simple underlay myringoplasty (SUM) was performed in 43 ears, and type 1 tympanoplasty (T1) in 6 ears. They were categorized as a non-mastoidectomy (NM) group ( $n=49$ ). Other 23 ears underwent tympanomastoidectomy including 19 canal wall-up (CWU) and 4 canal wall-down (CWD). They were classified into tympanomastoidectomy (TM) group ( $n=23$ ). In NM group, the operation was performed under local anesthesia except 4 cases. General anesthesia was needed in all TM group. The average operation time was 33 minutes in NM group (31 in SUM, 53 in T1), and 131 minutes in TM group (123 in CWU, 173 in CWD). The graft was successfully adapted in 84% (62/72) ears. The graft success rate was 82% (40/49) in NM group and 96% (22/23) in TM group. The average preoperative and postoperative air-bone gap (ABG) was 24.7dB and 14.5dB. The ABG was improved from 19.0dB to 12.4dB in NM group ( $p=0.000$ ), whereas in TM group, from 34.0dB to 18.1dB ( $p=0.001$ ). There were no systemic complications including postoperative delirium. **결론:** Chronic otitis media can be successfully treated in elderly patients without severe complication, therefore active surgical intervention may be considered in even elderly patients.

## OTOP 7

청각치료 및 재활 I

15:50~16:50 • 세미나실2

Chairperson(s) : 김형중(한림의대), 김보형(건국의대)

### OTOP-37 15:50~16:00

#### SHORT-TERM EXPERIENCE OF SLIM MODIOLAR ELECTRODE COCHLEAR IMPLANTATION

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, ASAN MEDICAL CENTER

JIN TAEK PARK, MIN YOUNG KWAK, YEHREE KIM, WOO SEOK KANG, JOONG HO AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** A number of surgeries using thin and perimodiolar electrodes (CI532) developed by Cochlear Ltd. have recently been performed in Korea. We aimed to investigate the short-term outcomes of CI532 compared with previous perimodiolar and straight electrodes. **방법:** From August 2018 to July 2019, fifty-one patients (twenty-three adults; seventeen children) who underwent cochlear implantation in Asan medical center with slim perimodiolar electrode (CI532) were included, except for severe inner ear anomalies. The operation time, hearing preservation and aided word recognition score (WRS) were analyzed with Nucleus CI24RE contour advance (perimodiolar type) and straight types of electrodes (CI422 and CI522). Also, the evoked compound action potential (ECAP) threshold, impedance, T- and C-levels were compared. **결과:** CI532 took significantly shorter operation time than straight type and CI24RE, and the ECAP thresholds of CI532 were significantly lower than the other two models in the apical electrodes.

CI532 showed the significantly lower impedences in the apex and base regions compared to straight electrodes. After implantation, CI532 showed significant hearing preservation at the most frequencies including 250Hz and showed significantly higher preservation rates than the straight electrodes, but not compared to CI24RE electrodes. However, there was no difference between the three groups with regard to the aided WRS. **결론:** CI532 showed a shorter operation time compared to the previous models. It showed better hearing preservation outcomes than the straight electrodes, and showed lower ECAP thresholds and impedences intraoperatively compared to the other electrodes. Further studies with a longer audiologic follow-up are necessary to verify the difference of audiologic outcomes.

### OTOP-38 16:00~16:10

#### EARLY EXPERIENCE WITH SLIM MODIOLAR COCHLEAR IMPLANT ELECTRODE ARRAY (CI532) IN TERMS OF INDICATIONS, FUNCTIONAL AND ELECTROPHYSIOLOGICAL OUTCOMES

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YOONJOONG KIM<sup>1</sup>, JIN HUH<sup>1</sup>, BYUNG YOON CHOI<sup>2</sup>

**목적:** To share short-term experience with newly developed slim modiolar cochlear implant electrode array focusing on the residual hearing preservation and electrophysiological outcomes. **방법:** We retrospectively recruited 59 ears(48 subjects) where CI532 was implanted by a single surgeon from June 2018 through July 2019. During the period, only those who had a significant residual hearing or cochlear ossification were implanted by other electrodes(n=5). Electrode

configuration analysis by intra-/postop. X-ray, and comparison of intraop. ECAP thresholds against slim straight electrodes and previous version of perimodiolar electrodes implanted by the same surgeon were performed. Degree of residual hearing preservation was also evaluated as suggested by Skarżyński et al. **결과:** CI532(n=59) was successfully implanted by a single surgeon through RW approach in nearly all cases, including inner ear anomaly and revision cases. A spiral configuration was shown in all cases as documented by X-ray indicating a successful perimodiolar location except only one case showing a tip-fold-over(1/59=1.69%). Among 59 cases, intraoperative ECAP was measured successfully in 51 cases. Excluding further 14 cases with a retrocochlear and brain cortex issue, ECAP thresholds of the remaining CI532 cases(n=37) showed a mean value of 184.52 current level (CL), which was similar to 183.19 CL of previous perimodiolar electrodes(n=12) but was significantly lower than 192.93 CL of slim straight electrodes(n=18,  $p=0.015$ ). Evaluation of degree of hearing preservation from 12 subjects with significant residual hearing showed a short-term preservation rate of 59.31% (77.68% for 4 children and 50.12% for 8 adults). **결론:** CI532 can be implanted virtually in any cases through RW, unless the cochlear anomaly is significant. Sufficiently lower ECAP thresholds coupled with a 59.1% hearing preservation rate of CI532 in our cohort may suggest CI532 as a combination of only advantages of lateral and perimodiolar electrodes.

#### OTOP-39 16:10~16:20

### LONG TERM THERAPEUTIC EFFECT OF HEARING AIDS AND DIRECTIVE COUNSELING IN PATIENTS WITH TINNITUS AND HEARING LOSS

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KOREA

JAE SANG HAN, JUNG MEE PARK, SO YOUNG PARK, JAE-HYUN SEO, HAMZAH ALSHAikh, SHI NAE PARK

**목적:** This study was conducted to evaluate the effect of hearing aids on tinnitus in the patients with tinnitus and hearing loss. **방법:** A total of eighty-four sensorineural tinnitus patients who visited our tinnitus clinic who were diagnosed as sensorineural tinnitus with mild to moderate hearing loss and were followed up with questionnaire and tinnitogram for more than 1 year were included in this study. All of the patients were treated with tinnitus retraining therapy(TRT) which consists of small group directive counseling and environmental sound with the strong recommendation of hearing aid. Patients were divided into two groups depending on the compliance of hearing aid prescription; 42 patients who accepted to wear hearing aids (Hearing Aid Group, HAG) and 42 patients who refused to wear hearing aids (Non Hearing Aid Group, NHAG). Long term therapeutic effect of hearing aids on their tinnitus were compared between HAG and NHAG using visual analog scale(VAS) as well as tinnitus handicap inventory(THI). **결과:** HAG showed female predominance( $p=.004$ ) and more severe hearing loss measured by pure tone audiogram and speech audiometry( $p=.000$ ). Initial THI and tinnitus VAS scores of annoyance were significantly higher in HAG than in NHAG( $p<.05$ ). And all VAS scores were significantly improved at 1 year after TRT regardless of hearing aid use( $p<.05$ ). The degree of improvement in tinnitus were not significantly different between HAG and NHAG. However, patients with severe and catastrophic tinnitus(n=13) in HAG showed significantly larger delta values compared to the patients with less severe tinnitus(n=29)( $p<.05$ ). However, in NHAG, specific differences in delta values were not observed in patients grouped by initial tinnitus severity. **결론:** Directive counseling with or without hearing aid

seemed to be effective in patients with tinnitus and hearing loss. Moreover, hearing aid seemed to be more effective in patients with hearing loss and more severe initial tinnitus measured by THI.

#### OTOP-40 16:20~16:30

### REVISION CI SURGERY: CAUSES AND DEVICE SURVIVAL RATES

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SO YEON KIM<sup>1</sup>, MIN BUM KIM<sup>2</sup>, WON-HO CHUNG<sup>2</sup>, YANG-SUN CHO<sup>2</sup>, SUNG HWA HONG<sup>1,3</sup>, IL JOON MOON<sup>1,2</sup>

**목적:** To analyze the revision surgery rate, causes of revision surgery, and device failure and survival rates of different device models in CI recipients **방법:** A total of 925 cochlear implantations at Samsung Medical Center from October 2001 to March 2019 were retrospectively reviewed. In the survival analysis, the first revision surgery was considered as the primary event, and the end point of observation was 1 June 2019. The revision surgery rate, causes of revision surgery, and the failure and survival rates of different device models were analyzed. The Kaplan-Meier method and the log rank test are used to present both the device survival and cumulative survival curves with rates. **결과:** In this study, 43 of 925 CI patients (4.6%) underwent a revision surgery. Device failure was the most common cause (3.0%). Flap-related problems and migration of the inner device were the next-most important causes.

Overall, the 10-year cumulative survival rate of CI surgery was 94.40%, and the device survival rate was 96.04%. 13 different CI devices from four different manufacturers were implanted, and no statistically significant differences in device failure were found among CI manufacturers or devices. Several recalls were issued by manufacturers during the study period, and after excluding the recalled devices, the device survival rates for 5, 10, and 15 years were 98.23%, 97.70%, and 94.99%, respectively. **결론:** Generally, implanted devices remain safe and stable for a long time, and no significant differences in survival rates were found between device types or manufacturers. Device failure was the main cause of CI revision, followed by flap-related problems and migration of the inner device.

#### OTOP-41 16:30~16:40

### A PROSPECTIVE STUDY OF AUDIOLOGICAL BENEFITS AND PERFORMANCE IMPROVEMENTS IN PATIENTS WITH BAHY ATTRACT IMPLANTATION

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TAE HOON KONG<sup>1,2</sup>, JIHYEON LEE<sup>1</sup>, CHANBEOM KWAK<sup>3,4</sup>, WOJAE HAN<sup>3,4</sup>, YOUNG JOON SEO<sup>1,2</sup>

**목적:** To evaluate the audiological and functional benefits, as well as performance improvements in patients with Baha Attract implantation. **방법:** We performed a prospective study. Thirteen consecutive adult patients



who were audiotically eligible for Baha Attract included in this study. All patients were followed-up and performed a series of audiological tests in the sound field before surgery, 1, 2, 3 and 6 months after surgery. Pure-tone audiometry (PTA), speech audiometry (SA), hearing-in-noise test (HINT), as well as sound localization test were performed to assess audiological benefits. Performance improvements were measured using the following questionnaires: the Spatial Hearing Questionnaire (SHQ), the Abbreviated Profile of Hearing Aid Benefit (APHAB) and the Glasgow Hearing Aid Benefit Profile (GHABP). **결과:** Based on their hearing impairment type and severity, 9 patients were a conductive hearing loss (CHL) or mixed hearing loss (MHL) and 4 patients were single-sided deafness (SSD). The hearing threshold aided with Baha Attract in the sound field was similar to preoperative bone conduction hearing threshold of better ear. The result of SA was improved postoperatively, but it did not reach that of the ear of better hearing before surgery. In case of HINT test, the overall score was gradually improved from 1 month to 6 months after surgery. The results of the sound localization test for SSD patients were not as good as those of CHL or MHL. The questionnaires of SHQ, APHAB, and GHABP demonstrated additional benefits which imply performance improvements. **결론:** The Baha® Attract provide enough auditory benefits and performance improvements for hearing impaired patients.

#### OTOP-42 16:40~16:50

### ASSOCIATION OF COFFEE CONSUMPTION WITH HEARING AND TINNITUS BASED ON A NATIONAL POPULATION-BASED SURVEY

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SANG-YOUP LEE<sup>1</sup>, GUCHEOL JUNG<sup>2</sup>, MYOUNG-JIN JANG<sup>2</sup>, MYUNG-WHAN SUH<sup>3,4</sup>, JUN HO LEE<sup>3,4</sup>, SEUNG HA OH<sup>3,4</sup>, MOO KYUN PARK<sup>3,4</sup>

**목적:** Coffee is the one of the most common beverages worldwide and has received considerable attention for its beneficial health effects. However, the association of coffee with hearing and tinnitus has not been well studied. The aim of this study was to investigate the association of coffee with hearing and tinnitus based on a national population-based survey. **방법:** We evaluated hearing and tinnitus data from the 2009–2012 Korean National Health and Nutrition Examination Survey and their relationship with a coffee consumption survey. All patients underwent a medical interview, physical examination, hearing test, tinnitus questionnaire and nutrition examination. Multivariable logistic regression models were used to examine the associations between coffee and hearing loss or tinnitus. We evaluated 13,448 participants (≥ 19 years) participants. **결과:** The frequency of coffee consumption had a statistically significant inverse correlation with bilateral hearing loss in the 40–64 years age group. Daily coffee consumers had 50%–70% less hearing loss than rare coffee consumers, which tended to be a dose-dependent relationship. In addition, the frequency of coffee consumption had an inverse correlation with tinnitus in the 19–64 years age group but its association was related with hearing. Brewed coffee had more of an association than instant or canned coffee in the 40–64 years age group. **결론:** These results suggest a protective effect of coffee on hearing loss and tinnitus.

## RHOP 1

수면장애 I

07:50~08:50 • 세미나실1

Chairperson(s) : 예미경(대구가톨릭의대), 정진혁(한양의대)

## RHOP-01 07:50~08:00

## EFFECT OF MOUTH CLOSURE ON UPPER AIRWAY OBSTRUCTION IN PATIENTS WITH SNORING AND SLEEP APNEA WITH MOUTH BREATHER: DISE STUDY

DEPARTMENT OF OTOLARYNGOLOGY, BUSAN SAINT MARYS HOSPITAL

GEUN-HYUNG PARK, TAE-KYUNG KOH, CHANG-LOK JI, HO-BYOUNG LEE, SANG-HOON LEE, SUNG-HOON JUNG, SOO-KWEON KOO

**목적:** Snoring and OSA have a variety of causative factors, of which oral breathing can affect the airway obstruction and resistance of the upper respiratory tract. We hypothesized that oral respiration during sleep changes the anatomical structure of the upper respiratory tract and this increases the severity of OSA. To evaluate the effect of oral respiration on upper airway, mouth closure of oral breathing patients under DISE was performed to observe airway changes

**방법:** In total, 18 OSAS patients were involved in this study. Measurement of obstruction site was obtained in two steps : first, DISE was performed with patient's mouth-open in accordance with natural sleep apnea, then, DISE was performed with the patient's mouth-closed using mouth strip(Somnifix®). To evaluate the quantitative changes of the upper airway before and after mouth closure, the pixel of the cross section of the obstruction site was measured using an area calculation program and statistically compared. **결과:**

Anatomical changes in the upper airway due to mouth closure were observed, with the retrolingual level being more affected than the retropalatal level. **결론:** Mouth closures are partly associated with anatomical structural changes in the upper airway and should be considered in the treatment of snoring and sleep apnea caused by upper airway obstruction.

## RHOP-02 08:00~08:10

## COMPARISON OF POLYSOMNOGRAPHIC FEATURES BETWEEN THE COMPLIANT AND NON-COMPLIANT PATIENTS WITH POSITIVE AIRWAY PRESSURE DEVICE IN SLEEP APNEA PATIENTS

DEPARTMENT OF OTORHINOLARYNGOLOGY, GACHON UNIVERSITY, GIL MEDICAL CENTER

JEONG-WOO PARK<sup>1</sup>, JAE-HWAN OH<sup>2</sup>, SEON-TAE KIM<sup>2</sup>

**목적:** The aim of this study is to investigate the difference of polysomnographic data according to positive airway pressure(PAP) device compliance. **방법:** Two hundred forty-six patients were enrolled. They have been prescribed PAP device for treatment of obstructive sleep apnea after polysomnography. According to their PAP using period, they were classified as compliance group and non-compliance group. Those who have used more than 3 months are compliance group and the non-compliance group are those who have failed using the PAP within 3 months. We have compared the polysomnographic data between the groups. Additionally, as the health insurance was applied for PAP from July 2018 in Korea, we further analyzed the compliance of the PAP for those who have been implemented afterwards. **결과:** Among the polysomnographic features, RDI score, sleep latency, and AHI supine score were significantly different between PAP compliance and non-compliance users ( $p < 0.005$ ). These results suggest that the severe AHI obstructive

sleep apnea patients have shown the significant compliance in using the PAP device. Additionally, national health insurance benefits have made a significant difference in the compliance of the PAP(p <0.005). **결론:** Among patients with sleep apnea, those with high RDI and AHI supine tend to use the PAP device better. Health insurance coverage has also shown a significant impact on compliance.

**RHOP-03 08:10~08:20**
**IMPACT OF SURGICAL CORRECTION OF NASAL PATHOLOGIES OF PAP COMPLIANCE AND THERAPEUTIC PAP PRESSURES IN OSA PATIENTS**

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL NATIONAL UNIVERSITY HOSPITAL

HEONJEONG OH, HYUNG GU KIM, JEON SEONG, YOUNG SEOK KIM, MINJU KIM, DONG-YOUNG KIM, CHAE-SEO RHEE, HYUN JIK KIM

**목적:** Despite PAP is a standard therapy for obstructive sleep apnea (OSA), a patient's compliance is still usual obstacle to effective treatment. The most cited reason for non-adherence to PAP seems to be nasal obstruction due to nasal structural problems and our study was aimed to examine whether surgical correction of nasal obstruction can be helpful to increase the adherence to PAP in OSA subjects. **방법:** 393 patients diagnosed with OSA and prescribed with autoPAP from 2017 Jan to 2019 Jul were included. Upon physical examination, PSG and sleep endoscopic findings, a surgical strategy for a patient was determined. We categorized the PAP users with nasal surgeries and the PAP records were reviewed prior to and after nasal surgeries. **결과:** Nasal surgery was considered first for the patients showing anatomical factors which are difficult to be corrected through sleep surgeries. 22 patients underwent the nasal surgery after they be-

gan to wear PAP device. Their mean AHI was 49.6/hr, tonsil grade 1.35, and palatal grade 3.41. Based on DISE finding, mean grade of retraglossal area narrowing was 2.71 and retroglossal area grade was 1.92. The data about compliance summary showed that 13.6% of patients (N=3) newly wore PAP machine following nasal surgery and unfortunately, 2 patients experienced a dramatic decrease in the percentage of date use PAP after nasal surgery. The average time to wear PAP and percentage of days with over 4 hr usage of PAP were relatively higher in other 17 patients following nasal surgery. In addition, autoPAP parameters including mean pressure (8.8 to 8.2 cmH<sub>2</sub>O), peak average pressure (10.2 to 9.8 cmH<sub>2</sub>O), average PAP pressure < 90% of time (9.9 to 9.6 cmH<sub>2</sub>O), and AHI were reduced in OSA patients who underwent nasal surgery. **결론:** This data demonstrate improved PAP compliance following nasal surgery in OSA patients with nasal obstruction and we suggest that surgical correction of nasal obstruction can provide the better therapeutic efficacy of PAP therapy to OSA patients.

**RHOP-04 08:20~08:30**
**POTENTIAL THERAPEUTIC EFFECT OF CPAP APPLIANCE ON LARYNGOPHARYNGEAL REFLUX IN OSA PATIENTS**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, REPUBLIC OF KOREA

JAE HYUK CHOI, JI-EUN CHOI, YANG-SUB NOH, SANG-DUK HONG, HUN-JONG DHONG, SEUNG KYU CHUNG, HYO YEOL KIM

**목적:** To investigate potential adjunctive therapeutic effect of CPAP treatment on laryngopharyngeal reflux in OSA patients **방법:** Retrospective analysis of prospectively collected data was conducted from

who underwent continuous positive airway pressure therapy after diagnosed as moderate to severe OSA. Subjects were asked to complete the reflux symptom index(RSI) questionnaire before and after CPAP. Also, laryngoscopic examination was performed to evaluate objective endoscopic findings (RFS; reflux finding score). **결과:** Total 16 patients were included in analysis. Overall mean RSI score was significantly decreased after CPAP appliance ( $13.38 \pm 6.65$  vs  $7.24 \pm 8.59$ ,  $p=0.02$ ). RFS initially was  $7.41 \pm 3.32$  and improved after CPAP treatment to  $4.65 \pm 2.12$  with statistical significance ( $p<0.001$ ). Within each subdomain of reflux finding score, Subglottic edema, Erythema/Hyperemia showed significant differences after CPAP treatment ( $p=0.06$ ,  $p=0.02$ , respectively). There were no differences between subgroups according to sex, age, body mass index, CPAP compliance. **결론:** There are accumulating evidences on close relationship between LPR and OSA. Recent meta-analysis demonstrated high prevalences of LPR (45.2%) in OSA patients. Meanwhile, there are no previous reports about additive treatment effect of CPAP on LPR. Our preliminary data result indicate CPAP appliance could gain adjunctive therapeutic outcome of laryngopharyngeal reflux in OSA patients.

**RHOP-05 08:30~08:40**
**EFFECT OF DEXAMETHASONE ON PAIN IN PEDI-  
ATRIC TONSILLECTOMY: A DOUBLE- BLIND RAN-  
DOMIZED TRIAL**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND  
NECK SURGERY, CHUNGBUK NATIONAL UNIVERSITY  
COLLEGE OF MEDICINE

MIN HYUCK KANG, WOO SUB SHIM, DONG WOOK  
LEE, YOUNG-SEOK CHOI, SEE-OK SHIN, HAHN JIN  
JUNG

**목적:** 편도절제술은 이비인후과에서 가장 많이 시행되

는 수술 중 하나이나, 아직도 많은 환자들이 편도절제술 후 통증으로 인하여 많은 불편감 및 불안을 겪고 있다. 이에 수술 후 통증을 경감시키기 위한 다양한 수술 방법 및 여러 약제 들의 사용에 대한 시도 및 연구가 이루어 지고 있다. 저자들은 정주 스테로이드가 소아 편도절제술 후 통증 등의 감소에 미치는 영향에 대해 확인하고자 하였다. **방법:** 2018년 11월부터 2019년 6월까지, 충북대학교병원 이비인후과에 코골이, 무호흡 등을 주소로 내원하여 편도절제술을 시행받은 14세 이하의 105명의 환자에 대해 연구를 시행하였다. 환자들은 수술 전 편도 및 아데노이드 크기, 편도선 염 유무 등에 대해 평가되었다. 무작위 배정을 통해 스테로이드를 투여 (0.5 mg/kg)한 군과 투여하지 않은 군으로 나누어 이중 맹검 하에 수술을 시행하였으며, 수술 후 1주일 간의 통증, 구역감, 구토 등에 대해 VAS score로 평가하였다. **결과:** 총 105명의 환자(남자 63명, 여자 42명)에 대해 분석하였다. 무작위배정을 통해 수술 중 스테로이드를 투여한 군 51명, 수술 중 스테로이드를 투여하지 않은 군 54명이 배정되었다. 두 군간 성별, 나이, BMI, 편도 및 아데노이드 크기, 수술 시간 등에 유의한 차이는 없었다. 수술 중 스테로이드를 투여한 군의 수술 후 7일간의 평균 통증은 3.59, 투여하지 않은 군은 4.35로 두 군간 유의한 차이는 없었다 ( $p = 0.069$ ). 수술 당일의 통증은 5.21, 6.38로 역시 두 군간 유의한 차이는 보이지 않았다 ( $p = 0.056$ ). 수술 후 당일부터 2일까지의 통증의 평균값을 비교해 보았을 때, 스테로이드를 투여한 군은 4.46, 투여하지 않은 군은 5.39로 두 군간 유의한 차이가 있었다. ( $p = 0.046$ ). 수술 후 구역감은 스테로이드를 투여한 군 1.89, 투여하지 않은 군 3.00으로 스테로이드를 투여한 군에서 유의하게 구역감을 적게 호소하였다. ( $p = 0.044$ ). **결론:** 소아 편도절제술에서, 정주 스테로이드의 투여가 수술 후의 통증과 구역 감소에 효과가 있었다.

**RHOP-06 08:40~08:50**
**MEAN SPO2 AND TOTAL AROUSAL INDEX COULD  
INFLUENCE TO THE OUTCOME OF SURGICAL  
TREATMENT OF SEVERE OSA ACCORDING TO**

**2012 SCORING RULE**

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD & NECK  
SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY  
KWON OH EUN, JIN-YOUNG MIN, SUNG WAN KIM

**목적:** There have been few studies about polysomnography(PSG) parameter associated with outcome of surgical treatment of obstructive sleep apnea(OSA). In this study, we aimed to find out PSG parameters related with outcome of OSA surgery. **방법:** Patients diagnosed as severe OSA and underwent surgical treatment were included from 2014 to 2017. All patients completed level I PSG before and 6months after surgery. PSG scoring was done by 2012 AASM criteria and OSA surgery was done according to the state of each patient. Age, gender, BMI, neck/waist/hip circumferences were collected. Surgical success was defined that apnea-hypopnea index(AHI) was decreased over 50% than before surgery and  $AHI < 20/h$ . PSG parameters were compared between success and failure groups. **결과:** A total 51 patients were included and 18 and 33 patients were categorized as success and failure groups. All patients showed significant improvement in PSG parameters when compared with before and after surgery. The mean age of success group was 31.8 and that of failure group was 39.5 years-old. There was no significant difference in AHI between two groups. However, in failure group, apnea index, apnea-hypopnea ratio, obstructive apnea percentage, non-supine AHI, mean apnea duration and longest apnea duration were significantly increased. Also, in failure group, mean SpO<sub>2</sub> was significantly lower but, lowest SpO<sub>2</sub> was not different between groups. In univariable logistic regression analysis, age, apnea index, lateral AHI, mean SpO<sub>2</sub>, mean apnea duration, longest apnea duration and total arousal index were risk factors related with outcome of surgical treatment. In multivariable logistic regression analysis, age, mean SpO<sub>2</sub> and total arousal index increased risk of surgical failure. **결론:** Mean SpO<sub>2</sub> and total arousal

index could be risk factors related with OSA surgical failure. However, in patients with apnea dominant and long apnea duration, we should careful consideration of OSA surgery and further study needs in large cohort.

**RHOP 2**

알레르기 기초 I

07:50~08:50 • 세미나실4

Chairperson(s) : 이흥만(고려의대), 김창훈(연세의대)

**RHOP-07 07:50~08:00**

### PI3K-DELTA-HIF-VEGF AXIS CONTRIBUTES TO THE DEVELOPMENT OF SINONASAL INVERTED PAPILLOMA

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, CHONBUK NATIONAL UNIVERSITY MEDICAL SCHOOL, JEONJU, SOUTH KOREA, <sup>2</sup>DEPARTMENT OF INTERNAL MEDICINE, RESEARCH CENTER FOR PULMONARY DISORDERS, CHONBUK NATIONAL UNIVERSITY MEDICAL SCHOOL

JONG SEUNG KIM<sup>1</sup>, SAM HYUN KWON<sup>1</sup>, JAE SEOK JEONG<sup>2</sup>, YONG CHUL LEE<sup>2</sup>

**목적:** Sinonasal inverted papilloma (IP) is well known for recurrence, local invasion, and malignant potential. There has been many attempts to elucidate the mechanism of IP, however, the exact mechanism regarding IP has not been elucidated. Herein, we first described the PI3k-HIF-VEGF axis in the sinonasal IP. Little is known on the pathogenetic mechanism of IP, currently. **방법:** IP tissues were obtained from 10 patients during the endoscopic sinus surgery and inferior turbinate tissues as healthy control were obtained from 10 control subjects during septoplasty or

skull base surgery. We performed the Western blot to evaluate the PI3k- $\delta$  expression and also performed confocal analysis to evaluate PI3k-HIF- VEGF axis. Confocal microscopic analysis for p110 $\delta$ , HIF-1 $\alpha$ , and VEGF protein and their quantification using image J program **결과:** In the Western blot, PI3k- $\delta$  and pAKT level was significantly elevated in the IP group compared with healthy control group. In the confocal analysis, PI3k- $\delta$  was highly expressed in the epithelium and submucosal layer of sinonasal IP, which has correlated with VEGF and HIF-1 $\alpha$ . **결론:** PI3k- $\delta$  was highly expressed in submucosal layer and epithelial layer, which is co-localized with VEGF and HIF-1 $\alpha$ . This result supports inflammatory process plays an important role in the development of IP. Hypoxic microenvironment naturally leads to angiogenesis, which ultimately mediates PI3k- $\delta$  to increase inflammation and induce the formation of IP.

#### RHOP-08 08:00~08:10

### PROBIOTICS ATTENUATES ALLERGIC AIRWAY INFLAMMATION VIA DOWNREGULATION OF HYPOXIA SIGNALING

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HYELIM PARK<sup>1,2</sup>, AH-YEOUN JUNG<sup>1,2</sup>, YOUNG HYO KIM<sup>1,2</sup>

**목적:** The beneficial roles of probiotics in lowering oxidative stress and inflammation have been frequently demonstrated. A recent study showed probiotics had been advocated for the prevention and treatment of allergic disease. However, the immunomodulatory effects and mechanism of probiotics on allergic airway disease such as asthma are unknown. This study investigated whether oral administrations of probiotics inhibited allergen-induced airway inflammation in a

mouse asthma model. **방법:** BALB/c mice were randomly assigned to the six experimental groups: controls; OVA-induced asthmatic mice; and OVA-induced mice orally administered with one of the two probiotics (*Lactobacillus paracasei* or *Bacillus clausii*, dose of  $1 \times 10^6$  or  $5 \times 10^6$  CFU, respectively). Effects of treatment were analyzed based on serum antibody levels, bronchoalveolar lavage fluids (BALF) cell counts, lung histology, lung cytokine levels, and airway hyperreactivity (AHR). **결과:** OVA-sensitized mice treated with probiotics had significantly reduced numbers of eosinophils and total cell in BALF compared to the OVA group ( $p < 0.05$ ). Probiotics also significantly reduced eosinophil infiltration, which decreased AHR and inflammation in the lung tissues of OVA-sensitized mice. Probiotics also reduced the levels of Th2 cytokines in BALF. A real-time PCR analysis of the expression of genes in lung tissues showed that probiotics could significantly decrease the levels of HO-1 and HIF-1 $\alpha$  expression compared to the levels in asthmatic mice ( $p < 0.05$ ). **결론:** These results indicate that probiotics attenuate airway inflammation and hyperresponsiveness by regulating HIF-1 $\alpha$  signaling in allergic airway disease. This finding suggests that probiotics have a role in the progress of the allergic disease, and might be used as a therapeutic tool of allergic airway inflammation.

#### RHOP-09 08:10~08:20

### THE EFFECT OF URBAN PARTICULATE MATTER ON TIGHT JUNCTION IN HUMAN NASAL EPITHELIAL CELLS

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, <sup>2</sup>CLINICAL RESEARCH INSTITUTE, DAEJEON ST MARYS HOSPITAL

DONG CHANG LEE<sup>1</sup>, HYUNSU CHOI<sup>2</sup>, JEONG-MIN OH<sup>2</sup>, SUNG WON KIM<sup>1</sup>, SOO WHAN KIM<sup>1</sup>, BYUNG

GUK KIM<sup>1</sup>, JIN HEE CHO<sup>1</sup>, JOOHYUNG LEE<sup>1</sup>

**목적:** Exposure to urban particulate matter (UPM) has been linked to the aggravation of various health problems. We investigated the effects of UPM on tight junction in cultured human nasal epithelial cells, the underlying signaling pathways involved **방법:** Human turbinate tissue specimens were collected during partial turbinectomies performed on five patients due to nasal stuffiness. Then the effects of UPM on the viability of cultured nasal epithelial cells were determined. Western blotting analyses were used to measure tight junction expression levels after exposure to UPM. Fluorescence microscopic evaluations were used to calculate the tight junction change after UPM treatment. **결과:** UPM reduced cell viability and tight junction in nasal epithelial cells. NAC treatment decreased the tight junction reduction via ROS production diminution in epithelial cells. **결론:** UPM can induce or aggravate rhinosinusitis via tight junction disruption.

RHOP-10 08:20~08:30

#### DIESEL EXHAUST PARTICLES ELEVATE MUC5AC AND MUC5B EXPRESSION VIA THE TLR4-MEDIATED ACTIVATION OF ERK1/2, P38 MAPK, AND NF-KB SIGNALING PATHWAYS IN HUMAN AIRWAY EPITHELIAL CELLS

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JOON-HEE KIM<sup>1</sup>, YOO SUN SONG<sup>1</sup>, TAE YEONG CHOI<sup>1</sup>, SOO YEON JO<sup>1</sup>, HYUNG GYUN NA<sup>1</sup>, YOON SEOK CHOI<sup>1</sup>, CHANG HOON BAE<sup>1</sup>, SI-YOUN SONG<sup>1</sup>, YONG-DAE KIM<sup>1,2</sup>

**목적:** Exposure to diesel exhaust particles (DEPs) is

known to cause serious health problems, owing to a steady increase in the number of diesel vehicles world-wide. DEPs comprise approximately 90% particle mass existing in the fine size range (2.5 μm) and are mainly absorbed in the respiratory tract. However, limited information is available on the effects of DEP exposure on the respiratory tract in humans. **방법:** Here, we investigated the effect and signaling pathways of DEPs on the expression of mucin, especially MUC5AC and MUC5B, in human airway epithelial cells by reverse-transcriptase polymerase chain reaction (PCR), real-time PCR, enzyme-linked immunosorbent assay, western blotting, and immunofluorescence staining. The signaling pathways activated following DEP-induced expression of MUC5AC and MUC5B in airway epithelial cells were analyzed by evaluating Toll-like receptor 4 (TLR4), mitogen-activated protein kinase (MAPK; extracellular signal-regulated kinase 1/2 [ERK1/2] and p38), and nuclear factor kappa B (NF-κB) phosphorylation with western blot and small-interfering RNA (siRNA) analyses. **결과:** DEPs significantly increased MUC5AC and MUC5B expression in human airway epithelial cells that was closely related to TLR4, MAPK (ERK 1/2 and p38), and NF-κB pathway activation. **결론:** This is the first report to demonstrate the DEP-mediated increase in MUC5AC and MUC5B expression via the TLR4-mediated activation of ERK1/2, p38 MAPK, and NF-κB signaling pathways in human airway epithelial cells.

RHOP-11 08:30~08:40

#### IDENTIFICATION OF URBAN PARTICULATE MATTER- INDUCED DISRUPTION OF HUMAN RESPIRATORY MUCOSA INTEGRITY USING WHOLE TRANSCRIPTOME ANALYSIS AND ORGAN-ON-A CHIP

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UNIVERSITY, SEOUL, REPUBLIC OF KOREA <sup>2</sup>CENTER FOR BIOMATERIALS, KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY, SEOUL, REPUBLIC OF KOREA

KIJEONG LEE<sup>1</sup>, JUNHYOUNG BYUN<sup>1</sup>, BO-A SONG<sup>2</sup>, KYUNGWOO LEE<sup>2</sup>, BYOUNGJAE KIM<sup>1</sup>, MYUNG-RYUL OK<sup>2</sup>, HOJEONG JEON<sup>2</sup>, SEUNG-KUK BAEK<sup>1</sup>, SANG-HEON KIM<sup>2</sup>, SEUNG JA OH<sup>2</sup>, SANGHAG LEE<sup>1</sup>, TAE HOON KIM<sup>1</sup>

**목적:** Exposure to ambient particulate matter pollution is known to negatively affect the human respiratory system. This study aimed to investigate the underlying mechanism of inflammatory changes after urban particulate matter (UPM) exposure in different cell types of human respiratory mucosa using whole transcriptome analysis, cell culture and organ-on-a-chip system. **방법:** Whole transcriptome sequencing of culture primary nasal epithelial cell before and after exposure of 100 $\mu$ g/ml of UPM for 24hrs was done. Gene expression in the primary epithelial cells, fibroblasts, and endothelial cells were measured by quantitative real-time PCR. Immunofluorescence staining was done to investigate epithelial and endothelial cell junction. Organ-on-a-chip platform consisted of three layers of different cell types. **결과:** The whole transcriptome analysis of primary nasal epithelial cells showed a total of 134 up-regulated and 94 down-regulated genes in UPM exposed group. Among them, 27 genes were belonged to inflammation category and 44 genes were shown to be involved in adhesive function. Validation of pro-inflammatory cytokine changes (IL1 $\beta$ , IL6, IL8, TNF- $\alpha$ ) and adhesive molecules(ZO-1, Occludin) using cell culture and organ-on-a-chip model showed consistent result. In addition, disrupted integrity of endothelial cell (ZO-1, ICAM-1) and increased release of inflammatory cytokine(IL1 $\beta$ , IL6, IL8, TNF- $\alpha$ ) from both endothelial cell and fibroblast were identified. **결론:** From this study, UPM has been shown to affect inflammatory responses and intercellular integrity in all of three various cells from

different layers of nasal mucosa. This phenomenon was identified not only when each cell was directly stimulated by UPM using traditional culture system, but also on organ-on-a-chip system that simulates the actual nasal mucosa, indicating that stimulation of particulate matter on epithelial cell layer could affect cells of layers underneath as well.

**RHOP-12 08:40~08:50**

#### **DIESEL EXHAUST PARTICLES-INDUCED EPITHELIAL-TO-MESENCHYMAL TRANSITION VIA ZEB2 DEPENDENT MANNER**

<sup>1</sup>OBSTRUCTIVE UPPER AIRWAY RESEARCH (OUAR) LABORATORY, DEPARTMENT OF PHARMACOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF BIOMEDICAL SCIENCES, SEOUL NATIONAL UNIVERSITY GRADUATE SCHOOL, <sup>3</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL

MINGYU LEE<sup>1,2</sup>, YI SOOK KIM<sup>1,2</sup>, ROZA KHALMURATOVA<sup>1</sup> HYUN-WOO SHIN<sup>1,2,3</sup>

**목적:** Diesel exhaust particles (DEP), which are major pollutants that cause traffic-related air pollution, are associated with the prevalence and exacerbation of allergic respiratory diseases including allergic rhinitis and allergic asthma. However, the mechanisms that promote upper airway diseases during DEP exposure remain undefined. Thus, we investigated the effect of DEP on upper airway epithelial cells and an upper airway inflammatory disease, chronic rhinosinusitis with nasal polyp (CRSwNP). **방법:** Gene set enrichment analysis (GSEA) and weighted gene co-expression network analysis (WGCNA) were performed in airway epithelial cells. Cytotoxicity, epithelial-to-mesenchymal transition (EMT) markers were assessed by using immunofluorescence analysis, immunoblotting, trans-epithelial electrical resistance



(TEER) and quantitative RT-PCR. Mice were exposed to DEP in a nose-only exposure system. **결과:** Bioinformatic analyses revealed that DEP exposure promotes EMT and cell migration potential in airway epithelial cells. Treatment of DEP induces EMT phenotype in human nasal epithelial cells (hNECs). In addition, DEP increased the protein levels of mesenchymal markers (N-Cad and  $\alpha$ -SMA), but decreased those of epithelial markers (E-Cad and ZO-1). Barrier dysfunction was observed by the treatment of DEP. Among the EMT-regulating genes, ZEB2 expression was found by the two different kinds of DEP (DEP1650b and DEP2975). We also detected the increase of ZEB2 expression in DEP-exposed mice. siRNA transfection targeting ZEB2 restored EMT features which were induced by the DEP. **결론:** Our results suggest that exposure to DEP induces ZEB2-dependent EMT in hNECs, which may contribute to epithelial remodeling. ZEB2 may be a therapeutic target for DEP-induced epithelial damage and related diseases.

## RHOP 3

부비동염 기초 I

10:30~11:30 • 세미나실4

Chairperson(s) : 이상학(고려의대), 김진국(건국의대)

**RHOP-13 10:30~10:40**

### CLINICAL ANALYSIS OF OLFACTORY ASYMMETRIC DYSFUNCTION

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MUCUS INSTITUTE, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>4</sup>KOREA MOUSE SENSORY PHENOTYPING CENTER, <sup>5</sup>GLOBAL RESEARCH LABORATORY FOR ALLERGIC AIRWAY DISEASES, <sup>6</sup>MEDICAL RESEARCH CENTER, YONSEI UNIVERSITY COLLEGE OF MEDICINE<sup>6</sup>

JONG-GYUN HA<sup>1</sup>, HYO JIN CHUNG<sup>2</sup>, JAE SUNG NAM<sup>1</sup>, JEONG JIN PARK<sup>1</sup>, HYUNG-JU CHO<sup>1,3,4</sup>, JOO-HEON YOON<sup>1,3,4,5</sup>, CHANG-HOON KIM<sup>1,3,4,6</sup>

**목적:** Olfaction is a chemoreception that is transmitted and perceived by a pair of olfactory nerves through bilateral nasal passages, which is achieved by a pair of olfactory nerves through bilateral nasal cavities. Olfactory dysfunction is generated usually on bilateral sides, but in some patients, asymmetric olfactory functioning was reported by themselves in outpatient clinic. We aimed to evaluate etiology of asymmetric olfactory dysfunction and analyze how asymmetric olfactory deficits appears in each subtest of the Korean version of Sniffin stick test II. **방법:** Retrospective review of total 1493 patients performed KVSS-II separately on each nostril from August 2016 to July 2018 was analyzed. For analyzing the aspect of each subtest (threshold, discrimination, identification) for TDI difference, Ratio of each subtest for TDI difference was statistically analyzed by repeated measures ANOVA for the subjects whose TDI difference over 10. **결과:** TDI score differences of unilateral KVSS-II over 5 were observed in 24.8% (n=371, range: 5.5~26.5) of total patients, over 10 were 7.2% (n=108). Mean value and standard error of difference ratio of each test were as followed: threshold  $0.17 \pm 0.01$ , discrimination  $0.47 \pm 0.02$ , identification  $0.36 \pm 0.02$ . For the pairwise comparisons of the mean value between the ratio of each subtest, all the comparisons show significant differences ( $p < .001$ ). **결론:** The results of this study show that the score reflected in each subtest may differ when asymmetric olfactory dysfunction is present. Discrimination might be most sensitive and threshold might be most insensitive for the change of olfactory

function. Further study is needed.

#### RHOP-14 10:40~10:50

### THERAPEUTIC EFFECTS OF INTRANASAL TOFACITINIB FOR CHRONIC RHINOSINUSITIS WITH NASAL POLYPS IN A MOUSE MODEL

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, GYEONGSANG NATIONAL UNIVERSITY CHANGWON HOSPITAL, CHANGWON, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, GYEONGSANG NATIONAL UNIVERSITY SCHOOL OF MEDICINE AND GYEONGSANG NATIONAL UNIVERSITY HOSPITAL

YEON-HEE JOO<sup>1</sup>, HYUN-JIN CHO<sup>2</sup>, YUNG JIN JEON<sup>2</sup>, JUNG JE PARK<sup>2</sup>, SANG-WOOK KIM<sup>2</sup>

**목적:** Chronic rhinosinusitis with nasal polyps (CRSwNP) is a multifactorial disease and the pathophysiology is not fully understood. Janus kinase(-JAK) and signal transducer and activator of transcription(STAT) pathway plays a key role in immune system. JAK inhibitor, tofacitinib(TOFA), reduce inflammation by inhibiting phosphorylation of STAT. We investigated activation of JAK-STAT pathway and the therapeutic effects of TOFA for CRSwNP using a mouse model. **방법:** According to previous protocols, eosinophilic CRSwNP model was induced using 4-week-old BALB/c mice. The therapeutic effects of systemic and topical TOFA were evaluated and compared with those of triamcinolone acetonide (TAC). Histopathologic examinations were conducted with hematoxylin and eosin for polyp formation and Sirius red staining for eosinophilic infiltration. The production of cytokines in sinonasal tissues, including tumor necrosis factor(TNF), interleukin (IL)-2, interferon- $\gamma$ , IL-4, IL-5, IL-10, IL-12, Granulocyte-macrophage colony-stimulating factor(GM-CSF), were measured using a ELISA. The phosphorylated STATs (pSTAT), ECP and eotaxin were evaluated using immunohis-

tochemistry. The level of gene expressions of GATA-3 and Foxp3 were measured using quantitative PCR. **결과:** The number of polyp-like lesions was reduced by TOFA, there was significant difference in topical administration group. The degree of eosinophilic infiltration was decreased significantly by topical tofacitinib. IL-5 and GM-CSF were reduced by systemic TOFA. pSTATs, ECP and eotaxin were significantly decreased by topical TOFA in immunohistochemistry. The level of gene expressions of GATA-3 and Foxp3 were decreased in topical TOFA administration groups. **결론:** Intranasal TOFA might be an effective drug for the eosinophilic CRSwNP by inhibiting phosphorylation of STATs

#### RHOP-15 10:50~11:00

### DEVELOPMENT OF A MOUSE MODEL OF ALTERNARIA INDUCED CHRONIC RHINOSINUSITIS MOUSE MODEL

DEPARTMENT OF OTORHINOLARYNGOLOGY, SCHOOL OF MEDICINE, CATHOLIC UNIVERSITY OF DAEGU

BU-KWAN KIL, BO-MUN KIM, BYUNG-JUN KANG, MI-KYUNG YE, SEUNG-HEON SHIN

**목적:** Epidemiological and clinical studies recognized the associations of between chronic rhinosinusitis (CRS) and asthma and the presence of airborne fungi in nasal cavity, such as Alternaria, Cladosporium and Aspergillus. Among them the Alternaria is associated with the development and persistence of airway inflammatory diseases. The aim of this study was to establish the Alternaria induced fungal rhinosinusitis murine model. **방법:** BALB/C mice were intranasally challenged with Alternaria alternate with or without intraperitoneal sensitization with ovalbumine (OVA) for 8 and 16 weeks. Sinonasal mucosal changes were histologically evaluated with hematoxyline and eosin and Periodic acid Schiff staining. Protein levels of in-

terleukin (IL)-4, IL-10, INF- $\gamma$ , and TNF- $\alpha$  in nasal lavage fluid were measured by ELISA. And total serum IgE and Alt a1 levels were measured. IL-4, IL-10, INF- $\gamma$ , T-bet, GATA-3, and FOX p3 mRNA in sinonasal mucosa were measured by RT-PCR. Mice splenocytes were treated with Alternaria for 72 hours then measured IL-4, IL-10, INF- $\gamma$ , and TNF- $\alpha$ .

**결과:** Serum IgE level was significantly increased at 8 and 16 weeks in OVA sensitized mice, and at 16 weeks OVA non-sensitized mice. IL-4 in NLF was significantly increase in OVA sensitized mince at 8 and 16 weeks and 16 weeks in OVA non-sensitized mice. TNF- $\alpha$  was increased at 8 weeks both OVA sensitized and non-sensitized mice. IL-4 production splenocyte was significantly increased by the stimulation with Alternaria both OVA sensitized and non-sensitized mice. Th1, Th2, and Treg cytokines and transcription factor mRNA was significantly increased in sinonasal mucosa of OVA non-sensitized mice at 8 weeks. Sinonasal mucosal inflammatory cell infiltration and mucin producing cells were increased both OVA sensitized and non-sensitized mice. **결론:** Alternaria combined with OVA induced Th2 dominant inflammation and Alternaria without OVA sensitized mice showed stronger Th1, Th2, and Treg immune response in CRS mouse model.

#### RHOP-16 11:00~11:10

### NASAL COMMENSAL-MEDIATED CHANGES OF POLYAMINE METABOLITES PRODUCTION AND REINFORCEMENT OF ANTIVIRAL ENVIRONMENT IN HUMAN NASAL EPITHELIUM

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

HYUN JIK KIM, ARA JO, JINA WON, CHAN HEE CHIL, ARA JO, CHAE-SEO RHEE

**목적:** The studies on the clear reaction of mucosal

microbiome with host increasingly take into consideration the contribution of mucosal immune responses and have also inquired into the immune-regulatory roles played by the commensal microbes residing in respiratory mucosa. Here, we sought to determine the interactions between the nasal microbiome, Staphylococcus epidermidis-related antiviral innate immune responses and shift of polyamine metabolites production. **방법:** S. epidermidis strains were isolated from nasal mucus of healthy individuals. The effects of S. epidermidis on production of metabolites using and polyamine dynamics were tested in vitro using normal human nasal epithelial (NHNE) cells through metabolomics, CE-TOFMS analysis. **결과:** Metabolome analysis was performed in 10 samples of cultured Medium using CE-TOFMS in two modes for cationic and anionic metabolites. We detected 344 metabolites on the basis of HMT's standard library and Known-Unknown peak library. Furthermore, putative metabolites which found in KEGG and HMP database were annotated. 179 peaks were detected and annotated on the basis of HMT's standard library. Among 179 target metabolites, 58 metabolites (40 in Cation and 18 in Anion Mode) were detected and quantified. Exposure of NHNE cells to nasal mucosa-derived S. epidermidis induced the change of polyamine metabolites production more dominantly. L-ornithine level was significantly elevated in the supernatant of S epidermidis-inoculated NHNE cells by 121 times as NHNE cells without inoculation but levels of putrescine, spermidine and spermine metabolites were not changed. The activity of ornithine decarboxylase and acetyltransferase for spermidine was significantly higher in S epidermidis-inoculated NHNE cells. **결론:** Nasal commensal S. epidermidis induces the changes of polyamine metabolites production most dominantly in nasal epithelium and shaped anti-viral responses in nasal epithelium through inhibition of polyamine production.

## RHOP-17 11:10~11:20

**TGF- $\beta$ 1-INDUCED HSP47 REGULATES EXTRACELLULAR MATRIX ACCUMULATION VIA SMAD2/3 SIGNALING PATHWAYS IN NASAL FIBROBLASTS**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY, COLLEGE OF MEDICINE, SEOUL, KOREA

JOO-HOO PARK, HAE-JI KIM, JONG-GEUN LEE, JAE-MIN SHIN, HYUN-WOO YANG, IL-HO PARK, HEUNG-MAN LEE

**목적:** HSP47 is a collagen-specific molecular chaperone. We investigated the relationship between HSP47 expression and ECM production in nasal mucosae of CRS. Also, we determined the underlying molecular mechanisms of TGF- $\beta$ 1-induced HSP47 and ECM production in nasal fibroblasts and nasal mucosa. **방법:** Nasal fibroblasts were stimulated with TGF- $\beta$ 1. Expression levels of HSP47 and ECM markers were measured using real-time PCR, western blotting, and immunofluorescence staining. siHSP47 was transfected for knockdown of HSP47. Fibroblast migration was analyzed using wound scratch assay and transwell migration assays. The contractile activity was measured with a collagen gel contraction assay. **결과:** The expression level of HSP47 is markedly increased in patients with CRS without nasal polyps. TGF- $\beta$ 1 induced HSP47 expression level. TGF- $\beta$ 1-induced ECM markers were inhibited by siHSP47. The Smad2/3 signaling pathway is involved in TGF- $\beta$ 1-induced HSP47 expression. TGF- $\beta$ 1-enhanced migration and contraction ability were inhibited by HSP47 knockout. Furthermore, glucocorticoid reversed the stimulatory effects of TGF- $\beta$ 1 on HSP47 expression and ECM production in fibroblasts and in ex vivo organ cultures of the nasal inferior turbinate. **결론:** HSP47 expression is involved in TGF- $\beta$ 1-induced myofibroblast differentiation and ECM production through the Smad2/3 signaling pathway

which might contribute to tissue remodeling in CRS.

## RHOP-18 11:20~11:30

**MECHANICAL COMPRESSION ENHANCES CILIARY BEATING THROUGH THE CYTOSKELETON REMODELING IN HUMAN NASAL EPITHELIAL CELLS**<sup>1</sup>SCHOOL OF MECHANICAL ENGINEERING, YONSEI UNIVERSITY, <sup>2</sup>AIRWAY MUCUS INSTITUTE, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINESEONG GYU LEE<sup>1</sup>, JAE-SUNG NAM<sup>3</sup>, SEHYUN PARK<sup>1</sup>, JONG-GYUN HA<sup>3</sup>, HYUNG-JOO CHO<sup>2,3</sup>, CHANG-HOON KIM<sup>2,3</sup>, SANG-NAM LEE<sup>2</sup>, HYUNGSUK LEE<sup>1</sup>, JOO-HEON YOON<sup>2,3</sup>

**목적:** Although many studies report the tissue remodeling and inflammatory responses in a variety of physical environments, the effect of mechanical compression on the mucociliary functions of nasal epithelial cells remains unclear. Here, we investigated how the beating dynamics of airway cilia depend on the applied compressive stress in primary human nasal epithelial cells. **방법:** A custom-made compression device was used to apply compressive pressure on apical compartment of Transwell inserts. On day 21 of ALI culture, HNE cells were exposed to constant compressive stress of 0, 50, 100, or 150 mmH<sub>2</sub>O for 3 h. Streptavidin coated f-beads was used for the analysis of cilia's trajectory. Ciliary beating was recorded on an inverted microscope equipped with an IncuStage incubating chamber. For the morphological studies, cytoskeleton immunostaining and SEM were done. **결과:** Static compressive stress of 100 mmH<sub>2</sub>O was sufficient to upregulate stroke speed of cilia thus enhanced ciliary beating frequency and mucociliary transportability. We observed that the compressive stress causes reorganization and thinning of the apical cytoskeleton

structure. We postulated that the dynamic characteristics of ciliary beating can depend on the viscoelastic properties of cell that is determined by the cytoskeleton organization. By developing a computational model to test this hypothesis, a computational model of a cilium demonstrated that decline in cytoskeleton viscosity increases cilium stroke speed. **결론:** The results indicate that compressive stress on airway epithelial cells induces faster ciliary beating via change in mechanical properties in apical cytoskeleton network. Our findings suggest that cytoskeleton remodeling due to compressive stress may enhance ciliary beating and increase the mucociliary clearance to prevent mucus stagnation that can occur during airway obstruction.

## RHOP 4

후각 및 기타

11:30~12:30 • 세미나실4

Chairperson(s) : 홍석찬(건국대의대), 김병국(가톨릭대의대)

**RHOP-19 11:30~11:40**

### THERAPEUTIC USE OF STEROIDS IN OLFACTORY DYSFUNCTION RELATED TO CHRONIC RHINOSINUSITIS WITH NASAL POLYPOSIS: A META-ANALYSIS

<sup>1</sup>SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL,

<sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

SUYEON PYO<sup>1</sup>, YOONJAE SONG<sup>1</sup>, SUNG-WOO CHO<sup>1,2</sup>, TAE-BIN WON<sup>1,2</sup>, JEONG-WHUN KIM<sup>1,2</sup>, CHAE-SEO RHEE<sup>1,2</sup>

chronic rhinosinusitis with nasal polyposis(CRSwNP). Although CRSwNP can be treated with surgery as the first-line therapy, medical treatment using steroid (systemic, topical steroid) is also widely used. However, the outcomes of olfactory dysfunction after steroid treatments are still unclear. The objective of this study was to determine the impact of steroid therapy on olfactory dysfunction with CRSwNP. **방법:** Two authors independently queried PubMed, EMBASE, Google Scholar, Cochrane Library, and Medline regarding olfactory outcomes in CRSwNP patients after medical treatment. The date of the last research of all databases was 11 Oct 2019. Following the screening, 119 full-text articles were assessed for the eligibility. After comprehensive reviewing, 89 were excluded because of non-randomized control trials (RCTs,) no olfaction variables and review articles. Comprehensive meta-analysis was used to analyze effect sizes, explore possible causes of heterogeneity, and check publication bias with a funnel plot and Egger's regression. **결과:** A total of 30 studies were included in the meta-analysis. Systemic steroid showed significant improvement in subjective and objective olfactory symptom compared to placebo (standardized mean difference [SMD] -2.73, 95% confidence interval [CI] -4.13 to -0.51; SMD 0.78, 95% CI 0.24 to 1.11 respectively). Among 16 studies of topical steroids, 10 showed statistically significant improvement of subjective olfaction outcome. Clinical impact of types of topical steroid(fluticasone, budesonide, mometasone), duration, comorbidity (asthma, allergic rhinitis, aspirin intolerance), ethnicity on olfaction with CRSwNP could not be evaluated due to lack of studies at this moment. **결론:** This high quality of evidence supports the effectiveness of systemic and topical steroid for improving olfactory dysfunction in CRSwNP as first-line therapy.

**목적:** Olfactory dysfunction is common in patient with

## RHOP-20 11:40~11:50

**NORMATIVE VALUES FOR THE YSK OLFACTORY FUNCTION TEST AND OPTIMIZATION FOR THE DIAGNOSTIC CUT-OFF**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>THE AIRWAY MUCUS INSTITUTE, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>KOREA MOUSE SENSORY PHENOTYPING CENTER, <sup>4</sup>GLOBAL RESEARCH LABORATORY FOR ALLERGIC AIRWAY DISEASES, <sup>5</sup>MEDICAL RESEARCH CENTER, YONSEI UNIVERSITY COLLEGE OF MEDICINE

JONG-GYUN HA<sup>1</sup>, JINWON KIM<sup>1</sup>, JAE SUNG NAM<sup>1</sup>, JEONG JIN PARK<sup>1</sup>, HYUNG-JU CHO<sup>1,2,3</sup>, JOO-HEON YOON<sup>1,2,3,4</sup>, CHANG-HOON KIM<sup>1,2,3,5</sup>

**목적:** We have developed a new (YSK) olfactory function test using culturally familiar odorants to Koreans. It comprises threshold (T), discrimination (D), and identification (I) and yielding a total score of each subtest. YSK olfactory function test uses safe odorants, and reflects olfactory experiences of Koreans. Here we present normative data and optimized diagnostic cut-off for the new diagnostic olfactory function test. **방법:** Data were obtained from 580 subjects aged 19–69 (234 females) All the subjects were classified by their statements (normosmia (262), hyposmia (277), and anosmia (41)) and by their age. (age group A: 19–29, age group B: 30–39, age group C: 40–49, age group D: 50–59, age group E 60–69) Diagnostic cutoff value of YSK olfactory function test for the anosmia and hyposmia were statistically calculated using ROC curve and AUC. **결과:** The mean value and standard error of each subtests (score ranging 0–12) and total score (score ranging 0–36) for the normosmia, hyposmia and anosmia group were as followed. Normosmia (T:  $4.7 \pm 0.2$ , D:  $8.6 \pm 0.1$ , I:  $11.3 \pm 0.1$ , Total score:  $24.6 \pm 0.3$ ), Hyposmia (T:  $3.1 \pm 0.2$ , D:  $6.9 \pm 0.2$ , I:  $9.4 \pm 0.2$ , total score:  $19.4 \pm 0.4$ ) Anosmia (T:  $1.2 \pm 0.3$ , D:  $4.7 \pm 0.3$ , I:  $6.0 \pm 0.5$ , total score:  $11.8 \pm 1.1$ ).

All the parameters above are statistically significant among each groups ( $p < .001$ , by ANOVA). Generally, mean value of each subtests and total score decreased by age increased. In the identification test, we compared % correct between universal odorants and Korean familiar odorants by age groups. Notably, there was significant difference between universal odorants and Korean familiar odorants in age group D. (89.8%, 97.1%, respectively,  $p = 0.037$ ) Diagnostic cut off value for the anosmia (total score  $\leq 14.5$ , AUC 0.808), hyposmia ( $14.5 < \text{total score} \leq 21.0$ , AUC 0.727) showed relevant diagnostic efficiency comparing to KVSS-II. **결론:** We developed the new olfactory function test and demonstrated that it is very useful to distinguish olfactory dysfunction.

## RHOP-21 11:50~12:00

**PROSPECTIVE ASSESSMENT OF GUSTATORY FUNCTION AFTER HEAD AND NECK RADIOTHERAPY: A PRELIMINARY STUDY**

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE, WONJU, SOUTH KOREA

CHI SANG HWANG, HUI JOON YANG, HEE SUNG CHAE, YOUNG SUB LEE, DONG-JOON PARK

**목적:** Taste disorders are a major cause of morbidity in patients undergoing head and neck irradiation. However, there are lack of studies conducted to investigate this commonly reported side effect. In this study, we quantitatively assessed gustatory function using a recently developed standardized tools measuring the sense of taste in a Korean population in patients with head and neck cancers who underwent radiotherapy. **방법:** In a prospective study, 20 patients undergoing head and neck irradiation responded to a specific questionnaire and were assessed by olfactory and gustatory function tests. To assess changes

over time, testing was performed before, immediately after, and at 2- and 4-week intervals following the start of radiotherapy. At the same time, the patients were evaluated for xerostomia from radiotherapy. **결과:** A decrease in the taste recognition threshold appeared on the second week after the beginning of radiotherapy and improved from the taste detection threshold within 14-18th week. Most affected patients demonstrated that the gustatory function was primarily decreased independently of the olfactory function. Disturbances in taste was exponentially worse beyond an accumulated dose of 30 Gy and involved all tastants. In subgroup analysis, radiation-induced taste impairment was not influenced by the degree of xerostomia but correlated between the dose of irradiation and the severity of taste disturbance. **결론:** In this preliminary study, we found that patients with head and neck cancer submitted to radiotherapy have disturbed taste even when irradiation does not include the oral cavity. This deficit is worse two weeks after the start of radiotherapy and returns between within 4.5 months. Our findings do not support the hypothesis that decreased salivary flow is the major cause for radiation-induced taste dysfunction.

**RHOP-22 12:00~12:10**
**THE CHANGE OF UPPER RESPIRATORY TRACT INFECTION (URI) INCIDENCE IN CHILDREN AFTER ADENOTONSILLECTOMY; 1-YEAR FOLLOW UP**

DEPARTMENT OF OTORHINOLARYNGOLOGY - HEAD & NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

DAE-WOONG KANG, OH-EUN KWON, JIN-YOUNG MIN, KUN-HEE LEE, SUNG-WAN KIM

**목적:** Although several infectious diseases like recurrent throat infection, chronic rhinosinusitis, severe otitis media are indication for adenotonsillectomy

(T&A), there is disagreement that surgery reduces the frequency of URI. Therefore, the aim of this study was to examine URI incidence after surgery. **방법:** Pediatric patients underwent T&A in Kyung Hee Medical Center and completed 1-year follow up had been included. The patients visited the hospital preoperatively and one year after the operation and performed physical examination, image study and questionnaire. The change of URI incidence per year including rhinitis, pharyngitis, sinusitis and otitis media, even with the improvement of sinusitis on Water's view was assessed through a questionnaire and image study. **결과:** Total 196 children (boys=130, girls=66) who underwent T&A were included in this study. The incidence of pharyngitis, rhinitis, sinusitis and otitis media per year was all decreased after T&A ( $p<0.05$ ). Also, the hospitalization due to URI and pneumonia per year was also decreased ( $p<0.05$ ). In the preoperative water's view, 57 patients had sinusitis. Among them, 40 patients (70%) showed improvement of sinusitis from water's view after 1-year follow up. Most patients responded to decreased postoperative URI incidence and hospitalization (96%, 94%) after 1-year follow up of T&A. **결론:** URI incidence and hospitalization by URI were decreased after T&A. Also, patients are satisfactory in T&A. Therefore, Adenotonsillectomy has benefit for patient with not only obstructive symptoms, but also recurrent URI.

**RHOP-23 12:10~12:20**
**DEVELOPMENT OF A HUMAN AIRWAY ORGANOID AND CONSIDERATION OF APPLICATION**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA

DO HYUN KIM, SUNG WON KIM

**목적:** To establish a three-dimensional culture method for organoid of human airway tissue, which regenerates itself to produce epithelium of nasal mucosa, which includes pseudostratified columnar ciliated cells and secretory cells. **방법:** We harvested mucosal tissue from inferior turbinate mucosa and isolated cells from the mucosa. After coating 5% matrigel on a 48 well plate, the isolated cell were mixed with matrigel in a 4:1 ratio to give a final concentration of 25%. We incubated cell in airway organoid media for 34 days. We observed the process of organoid formation by light microscope during incubation. We performed H&E staining for histology, and immunofluorescence staining with ciliated cell marker (acetylated tubulin) and tight junction marker (E-cadherin) to confirm the organoid. **결과:** During 34days culture in AO media, average 130  $\mu$ m size of spheroid was formed in matrigel. The cilia were observed at the inside of spheroid, and E-cadherin were observed at the outer layer of spheroid by immunofluorescence. Differentiated organoid had similar structure with respiratory epithelium. **결론:** Human airway organoid can be made by human nasal airway tissue. However, many considerations will be needed for disease modeling and standardization using organoids.

RHOP-24 12:20~12:30

#### GENETIC MUTATIONS AND CLINICAL PHENOTYPES OF KOREAN PATIENTS WITH HEREDITARY HEMORRHAGIC TELANGIECTASIA

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD & NECK SURGERY, GACHON UNIVERSITY SCHOOL OF MEDICINE, GIL MEDICAL CENTER, <sup>4</sup>DR JINS PREMIUM NOSE CLINIC, <sup>5</sup>DEPARTMENT OF OTOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, <sup>6</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY- HEAD & NECK SURGERY, KYUNG HEE UNIVERSITY, <sup>7</sup>DEPARTMENT OF OTORHINOLARYNGOLOGYHEAD AND NECK SURGERY,

SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, <sup>8</sup>DEPARTMENT OF PHYSIOLOGY AND FUNCTIONAL GENOMICS, COLLEGE OF MEDICINE, UNIVERSITY OF FLORIDA, <sup>9</sup>DEPARTMENT OF NEUROBIOLOGY, BARROW NEUROLOGICAL INSTITUTE, USA, <sup>10</sup>LEE GIL YA CANCER AND DIABETES INSTITUTE, GACHON UNIVERSITY

SEON-TAE KIM<sup>1</sup>, JOO-HYUN JUNG<sup>1</sup>, JAE-HWAN OH<sup>1</sup>, JUNG-WOO PARK<sup>1</sup>, HONG-RYUL JIN<sup>4</sup>, YONG-JU JANG<sup>5</sup>, SUNG WAN KIM<sup>6</sup>, SEUNG-KYU CHUNG<sup>7</sup>, S PAUL OH<sup>8,9</sup>, YOUNG JAE LEE<sup>10</sup>

**목적:** Hereditary hemorrhagic telangiectasia (HHT) is an autosomal dominant vascular disorder characterized by epistaxis, telangiectases and focal arteriovenous malformations (AVMs). Activin receptor-like kinase 1 (ALK1/ACVRL1) and Endoglin (ENG), receptors for transforming growth factor- $\beta$  (TGF- $\beta$ ) superfamily, are the principal genes that cause HHT. This is the first large-scale multicenter study to investigate correlations between genetic mutations and clinical outcomes in Korean HHT patients. **방법:** Seventy three patients, who were diagnosed as definite or suspected HHT based on Curaçao diagnostic criteria, were enrolled. They were genetically screened with mutation genes, ACVRL1 and ENG. The genetically diagnosed HHT patients were also evaluated the clinical manifestations. **결과:** Forty two patients were positive for for HHT genetic mutation screening . In the clinical presentation, epistaxis was most common in 90%, telangiectasia 55%, family history 88%, arteriovenous malformation (AVM) in 57%. ENG mutation genotype were 26patients(62%) and ACVRL1 mutation genotype were 16 patients (38%). According to Curacao criteria, 24 patients (57%) were definite group, 10 patients(24%) were probable and 1patient(2%) was unlikely. **결론:** This result suggest that the clinical presentation was significantly correlated with the genetic mutation study. This result suggest that for the the clinically suspected patients, we need



the genetic mutation analysis to confirm the HHT.

## RHOP 5

비중격 수술

13:30~14:30 • 세미나실3

Chairperson(s) : 이재용(순천향의대), 배우용(동아의대)

**RHOP-25 13:30~13:40**

### TREATMENT OF SEPTAL PERFORATION USING AN ALLOGRAFT DERMAL MATRIX WITH CARTILLAGES COMPOSITE GRAFT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOSIN GOSPEL HOSPITAL, KOSIN UNIVERSITY SCHOOL OF MEDICINE

DONG-YOUNG KIM, JAE-HWAN KWON, JOO-YEON KIM

**목적:** Septal perforation can be occurred by mainly postnasal surgery(septoplasty), chemical irritants, and unknown causes. Several techniques have been introduced to repair the septal perforation. However, no standard treatment has been established for the repair of septal perforation. Recently, acellular allograft mesh has been proposed to be used for repair of septal perforation. We introduce repair of septal perforation using the interpositional graft made up of allograft mesh conjugate with autologous cartilage without advancement of septalmucosal flap. **방법:** 10 patients were included in this study. The most common causes of septal perforation were previous operation. 7 patients underwent septoplasty, 3 cases were failed to specify the direct cause. Megaderm is used as an interpositional allograft piled up by cartilage, and it is positioned between the both flaps by guide of endoscope.

There is no further procedure to fix the interpositional graft. A silastic sheet is left at both side of the septum until complete healing is verified by an endoscopic examination in the outpatient department. **결과:** Mean perforation size was 7.1mm(3mm to 13mm). 7 cases were not conducted advancement flap or further anchoring procedure. 3 cases were conducted one side of anchoring suture without advancement flap. Mean F/U duration was 14.3 weeks(6wks to 41wks). All the cases showed complete closure without reperforation. **결론:** Allograft mesh with cartilage graft provides firm template for the repair of septal perforation without advancement of septalmucosal flap, and also, this combinant graft prevents it to slide away, we don't have to fix the graft to the remnant septal cartilage or mucosa, which gives us great convenience in repair of septal perforation.

**RHOP-26 13:40~13:50**

### BARBED SUTURE TECHNOLOGY APPLICATION ON THE FIELD OF SEPTAL SURGERY : NEW PARADIGM SHIFT IN SEPTAL CARTILAGE SUTURING?

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SONGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE

JI-EUN CHOI, YANG-SUB NOH, SANG DUK HONG, HUN-JONG DHONG, SEUNG-KYU CHUNG, HYOEOL KIM

**목적:** To investigate surgical outcome of septoplasty applying barbed suture technology and propose novel surgical concept in correction of septal deviation. **방법:** Medical records of 25 patients who underwent septoplasty using barbed suture (Stratafix) from March 2019 to June 2019 were retrospectively reviewed. Previously reported modified mattress suture on high dorsal or caudal deviation combined with mustard suture were applied with barbed suture.

Subjective and objective outcomes were evaluated with questionnaires (NOSE, SNOT-22) and acoustic rhinometry after surgery. **결과:** Significant subjective improvements were noted after barbed septoplasty. Mean preoperative NOSE score was  $9.25 \pm 6.16$  and decreased significantly to  $2.12 \pm 2.06$  postoperatively. Also, SNOT-22 showed significant improvement ( $38.00 \pm 18.70$  to  $16.00 \pm 9.25$ ,  $p < 0.001$ ). On acoustic rhinometry, cross-sectional area (CSA(1);  $0.57 \pm 0.42$  to  $0.9 \pm 0.44$  cm<sup>2</sup>) and CSA(2) ( $1.10 \pm 0.56$  to  $1.53 \pm 0.51$  cm<sup>2</sup>) at the narrower sides showed significant improvements ( $p < 0.001$ ). There were no adverse events or minor complications postoperatively. **결론:** Barbed septoplasty is a promising option in correcting deviated septum. By our preliminary results, we propose powerful alternative surgical method using barbed suture technology. Since there is no published data, further studies are required to validate and apply in the field of septal surgery.

14 patients who underwent septoplasty using Osteomesh™ for correction of caudal septal deviation were analyzed. Briefly, batten graft using Osteomesh™ was placed on septal cartilage (usually on the concave side) and fixed with 4-0 polydioxanone sutures. Subjective patient satisfaction regarding nasal obstruction were evaluated using the VAS score. Objective pre- and postoperative endoscopic findings were evaluated. **결과:** All patients showed significant improvement in mean VAS score after surgery ( $6.81 \pm 2.11$  preoperatively vs  $2.13 \pm 1.90$  postoperatively;  $P < 0.001$ ). On endoscopic evaluation for surgical outcome, 11 patients (78.6%) showed favorable outcomes and 3 (21.4%) had improved but residual caudal deviation. Postoperative complication included extrusion of Osteomesh™ in 1 patient without any infection and subjective discomfort. **결론:** Correction of caudal septal deviation using Osteomesh™ in septoplasty is a relatively safe surgical option with favorable surgical outcomes.

## RHOP-27 13:50~14:00

### USE OF OSTEOMESH™ FOR CORRECTION OF CAUDAL SEPTAL DEVIATION IN SEPTOPLASTY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

HEE JIN KANG, SOO YOUNG CHOI, OH EUN KWON, KUN-HEE LEE, SUNG WAN KIM, JIN-YOUNG MIN

**목적:** Surgical management of caudal septal deviation can be a challenging problem. Osteomesh™ is a bioresorbable implant made of a US FDA approved polymer called polycaprolactone (PCL) and is commonly used in craniofacial surgery to repair various types of fractures and to fill surgical defects, and in rhinoplasty. In this study, we analyzed our experience using Osteomesh™ for correction of caudal septal deviation in septoplasty. **방법:** Medical records from

## RHOP-28 14:00~14:10

### PREVENTION OF NASAL SEPTAL PERFORATION USING DECELLULARIZED MUCOSA PATCH: EXPERIMENTAL RABBIT MODEL OF MUCOSAL DEFECT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, EWHA WOMAN'S UNIVERSITY, SEOUL, KOREA

SOJEONG KIM<sup>1</sup>, SOOYEON JUNG<sup>2</sup>, HANSU KIM<sup>3</sup>, JUNGHO BAE<sup>4</sup>

**목적:** The purpose of this study was to investigate the usefulness of Decellularized mucosa patch for the prevention of nasal septal perforation, after a surgically created mucosal defect in the rabbit nasal septum. **방법:** A 8 mm-diameter circular mucosal defect was made in the septum of forty New Zealand white rabbits. The rabbits were divided into three groups

(twelve rabbits in each group) according to the type of intervention; silastic sheet (control), silastic sheet and unilateral decellularized patch(experimental I), silastic sheet and bilateral decellularized patch(experimental II) group. The diameter of the defect, area, mucosal thickness, epithelial thickness, and cartilage thickness were evaluated every 1, 2, 4, 8 weeks. **결과:** The average defect size and area were significantly reduced after 2 weeks in the experimental group compared to the control group. When comparing the unilateral patch group (experimental I group) and the bilateral patch group (experimental II group), it was confirmed that the bilateral patch applied group had a larger decrease in defect size and area. When comparing the rate of perforation, it was confirmed that the experimental groups(I&II) had lower rate of perforation, compared to the control group. **결론:** Decellularized mucosal patch can be used as a connective tissue in the prevention of septal perforations with high success rates.

#### RHOP-29 14:10~14:20

### L-CUTTING AND SUTURE TECHNIQUE FOR CAUDAL AND HIGH SEPTAL DEVIATION (PRELIMINARY STUDY)

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, ULSAN UNIVERSITY HOSPITAL, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, ULSAN, KOREA

TAE-HOON LEE, TAE-UK CHEON, JIN IL KIM, JUNG-GWON NAM

**목적:** We describe a novel septoplasty technique to correct caudal and high deviation simultaneously. **방법:** We underwent the L-cutting and suture technique on the patients with caudal and high septal deviation together. L-shape incision was made on the L-strut of the nasal septum. After elevating the other side mucoperiosteum through the L-cutting, two cut ends

were overlapped and sutured vertically and horizontally. Nasal Obstructive Symptoms Evaluation (NOSE) scale scores and acoustic rhinometry were checked preoperatively, 3 months postoperatively. Profile photos of the patients were taken preoperatively to identify the occurrence of nasal saddling or tip dropping. **결과:** Twenty-nine patients underwent septoplasty by our novel technique. The NOSE scale score changed from 67.5 to 7.5. The MCA on the convex side changed from 0.33 cm<sup>2</sup> to 0.61 cm<sup>2</sup>. There were neither major nor minor complications, such as saddle nose, septal hematoma, infection, or postoperative bleeding. **결론:** The L-cutting and suture technique is relatively easy and very effective in correcting caudal and high septal deviation simultaneously.

#### RHOP-30 14:20~14:30

### UNDERDIAGNOSED UPPER LATERAL CARTILAGE WEAKNESS OF WIDER SIDE IN SEVERE DEVIATED NASAL SEPTUM

DEPARTMENT OF OTORHINOLARYNGOLOGY, KEIMYUNG UNIVERSITY SCHOOL OF MEDICINE

KI HO BAE, BON MIN KOO, TEA HWAN KIM, DONG EUN KIM, JONG IN JEONG

**목적:** 비폐색을 유발하는 비중격 만곡증에 대한 비중격 교정술은 이비인후과에서 많이 시행되는 수술이다. 특히 휘어진 비중격에 의해 좁아진 쪽과 비폐색 증상이 심한 쪽의 증상이 일치하는 경우 비중격 교정술로 직접적인 증상 호전을 기대할 수 있다. 그러나 비중격 교정술 이후에도 다양한 원인에 의해 지속적 인 비폐색 증상을 호소하는 경우들이 있으며, 그 중에는 비중격 만곡증이 성공적으로 교정되었음에도 비폐색 증상을 호소하는 경우도 있다. 이에 본 저자들은 성공적인 비중격 교정술 이후에도 비폐색 증상이 나타나는 원인에 대해 연구하고자 하였다. **방법:** 2016년 3월부터 2019년 6월까지 본원에서 비중격 교정술을 시행한 환자 172명을 대상으로 후향 적 의무기록 분석을 하였다.

이전에 비중격 교정술을 포함하여 비강 및 부비동에 수술 시행받은 적이 없고, 술전 좁아진 쪽과 비폐색 증상을 호소하는 쪽이 일치하여 비중격 교정술을 진행한 환자를 대상으로 하였다. 수술 후 비내시경 소견과 음향비강통기도 상 최저단면적 좌우비를 확인하였을 때, 비중격 만곡증이 성공적으로 교정된 환자들 중 증상이 호전된 군과 지속적으로 증상을 호소하는 군으로 나누어 알레르기 MAST 결과, 수술 전후 비폐색 증상 점수 (NOSE scale), 음향비강통기도 검사, Modified Cottle's test의 결과 변화를 비교하였다. **결과:** 총 137명의 환자가 성공적으로 비중격 만곡증이 교정되었으며 이중 증상이 호전된 군은 111명, 지속 적으로 증상을 호소하는 군은 26명이었다. 평균 연령은 증상 호전군이 43.2세, 증상 지속군이 60.7 세였다. 증상 호전군에 비해 증상 지속군에서 알레르기 MAST 결과 상 양성 반응이 있는 경우가 유의 하게 높았으며 (24.3% vs 53.8%), 수술 후 기존에 비폐색이 없던 쪽의 증상 점수 증가가 유의 하게 높았다. 증상 지속군에서 수술 전후 비폐색 증상이 있는 쪽이 변함 없는 경우(n=6)에 비해, 증상이 반대쪽에서 나타는 경우 (n=20) 수술 후 Modified Cottle's test 가 양성인 비율이 유의하게 높았으며 (16.7% vs 65%),수술 전 증상이 있던 쪽으로 심도의 비중격 만곡증이 있었던 비율도 유의하게 높 았다 (16.7% vs 85%) **결론:** 심한 비중격 만곡증 환자에서 넓은 쪽 비강의 내비밸브 기능 약화가 술전에는 저평가될 수 있으며 이는 수술 후 지속적인 비폐색 증상을 유발할 수 있다.

## VISION AUGMENTATION RHINOPLASTY USING CROSS-LINKED HUMAN ACELLULAR DERMAL MATRIX

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YOUNG WOO LEE<sup>1</sup>, SANG-CHUL PARK<sup>2</sup>, JAE-SUNG NAM<sup>1</sup>, JONG-GYUN HA<sup>1</sup>, PARK JEONG JIN<sup>1</sup>, JOO-HEON YOON<sup>1,3</sup>, HYUNG-JU CHO<sup>1,3</sup>, CHANG-HOON KIM<sup>1,3</sup>

**목적:** Various materials are used for nasal dorsal augmentation in rhinoplasty. Among them, cross-linked human acellular dermal matrix (ADM) is biocompatible material owing to its long-term structural integrity and stability as well as low risk of infection or extrusion. However, there have been no studies investigating the effectiveness in augmentation using ADM in revision rhinoplasty. Thus, we aimed to compare the surgical outcome and effectiveness between primary and revision rhinoplasty using ADM. **방법:** From November 2013 to February 2018, the authors report the results from a series of 132 patients (primary, 99; revision, 33) using ADM for dorsal augmentation. Preoperative and postoperative photographs were reviewed for the dorsal height (DH) and radix height (RH). Subjective satisfaction of patients and surgeons for aesthetic and functional results were also examined. **결과:** Most of the patients showed favorable results of dorsal augmentation on external nasal physical examination and endoscopic finding. The degree of augmentation represented by ratio of DH and ratio of RH was comparable between primary and revision rhinoplasty using ADM. Surgeons' satisfaction of successful outcome was 80.1% and 71.2% in primary and revision rhinoplasty, respectively. In subjective evaluations of patients' satisfaction, patients with primary

## RHOP 6

성형 및 외상

14:30~15:30 • 세미나실3

Chairperson(s) : 장진순(인제대의대), 권재환(고신의대)

**RHOP-31 14:30~14:40**

**SURGICAL OUTCOMES OF PRIMARY AND RE-**

rhinoplasty (81.2%) showed slightly greater satisfaction than those with revision rhinoplasty (70.5%). No serious complications, such as infection, foreign body reaction, or graft extrusion, were observed. The graft displacement and resorption were occurred in 2.1% and 3.1% of the primary rhinoplasty patients, respectively. **결론:** The authors suggest that ADM can be a valuable material that delivers adequate augmentation and subjective satisfaction with minimal complications in both primary and revision augmentation rhinoplasty. Care should be taken especially in thin-skinned patients and those with preexisting vascular compromise.

**RHOP-32 14:40~14:50**
**VALIDATION OF THE KOREAN VERSION OF THE STANDARDIZED COSMESIS AND HEALTH NASAL OUTCOMES SURVEY (SCHNOS)**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

WOO RI CHOI, YONG JU JANG

**목적:** The 10-item Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS) is a recently developed questionnaire for assessing both nasal obstruction and nasal cosmetic satisfaction. It is widely used in rhinoplasty clinics based on its high level of reliability and efficacy in Western countries. In this study we evaluated the validity of the Korean version of the SCHNOS (K-SCHNOS). **방법:** The SCHNOS was translated in easily-understandable Korean following developers' guideline. Twenty-seven patients undergoing rhinoplasty and 29 non-rhinoplasty patients of control group completed K-SCHNOS twice at intervals of 2 weeks regardless of pre- or post-operative state. The K-SCHNOS was evaluated for

internal consistency, test-retest reliability, and validity.

**결과:** Of the 56 study participants, 39 (69.6%) were male and 17 (30.4%) were female, with a mean (SD) age of 33.5 (12.9) years. Both obstructive domain and cosmetic domain showed a high internal consistency with Cronbach's  $\alpha$  of 0.92 and 0.91, respectively. The correlations in the test-retest analysis for each item were acceptable ranging from 0.6–0.82. The association between obstructive domain and cosmetic domain was 0.48 (95% CI, 0.32–0.61) indicating a very weak correlation. **결론:** The K-SCHNOS has proven to be a reliable and valid questionnaire to be used in Korean-speaking patients who undergo functional or cosmetic rhinoplasty.

**RHOP-33 14:50~15:00**
**EVALUATION OF PREFERRED NASAL SHAPE AND DEGREE OF CONFORMITY BETWEEN ACTUAL POSTOPERATIVE SHAPE AND SIMULATED IMAGE OF THE NOSE USING 3D SCANNER**

DEPARTMENT OF OTORHINOLARYNGOLOGY, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, ASAN MEDICAL CENTER  
SHIN HYUK YOO, YONG JU JANG

**목적:** The present study was designed to assess the anthropometric measurement of patients' preferred external shape acquired by 3D scanning device (Morpheus 3D Plastic solution 3.0, Morpheus Co., Ltd.). In order to study the impact of preoperative simulation on the postoperative aesthetic outcome, the correspondence of the anthropometric parameters between the simulated images and real postoperative images was evaluated using measurement option in 3D scanner program. **방법:** Total 75 patients (48 female and 27 male) who underwent rhinoplasty between October 2018 and July 2019 at Asan Medical Center by the senior author were retrospectively reviewed. 3D scanner software enabled us to measure the anthropomet-

ric parameters: nasal length, bridge height, tip height and nasofrontal, nasofacial, nasomental, nasolabial angle. Desired nasal shape by the rhinoplasty candidates were evaluated and a comparison of anthropometric parameters between the simulated images and 1-month postoperative images were made. **결과:** Mean anthropometric values of preferred 3D image were  $144.7 \pm 6.1^\circ$ ,  $31.1 \pm 3.0^\circ$ ,  $130.5 \pm 4.7^\circ$ ,  $98.5 \pm 7.6^\circ$  in nasofrontal, nasofacial, nasomental, nasolabial angle and  $47.7 \pm 4.0\text{mm}$ ,  $14.2 \pm 2.9\text{mm}$ ,  $26.2 \pm 2.9\text{mm}$  in nasal length, bridge height, tip height respectively. There was no significant difference in nasofacial angle ( $31.2 \pm 3.2$  and  $31.1 \pm 3.0^\circ$ ,  $P=0.914$ ), nasal bridge height ( $14.4 \pm 2.8$  and  $14.2 \pm 2.9\text{mm}$ ,  $P=0.482$ ) and tip projection ( $26.5 \pm 3.2$  and  $26.2 \pm 2.9\text{mm}$ ,  $P=0.118$ ) while there was no correspondence in nasofrontal ( $148.0 \pm 8.6$  and  $144.7 \pm 2.8^\circ$ ), nasolabial angle ( $103.8 \pm 9.0$  and  $98.5 \pm 7.6^\circ$ ) and nasal length ( $50.2 \pm 3.8$  and  $47.7 \pm 4.0\text{mm}$ ) comparing postoperative and simulated 3D images ( $P<0.001$ ). **결론:** Three-dimensional computer simulation is a powerful and effective tool for assessing preferred nasal appearance and a reliable predictor of postoperative results in Asian rhinoplasty. Scanning of 3D image is also an useful tool for objectively analyzing postoperative changes in terms of anthropometric parameters.

#### RHOP-34 15:00~15:10

### CLINICAL APPEARANCE OF VASCULAR COMPROMISE AFTER FILLER INJECTION

SHIMMIAN RHINOPLASTY CLINIC

SANGMIN HYUN, DONG-HAK JUNG

**목적:** 필러 주사는 간단하고 빠른 효과를 얻을 수 있는 장점 때문에 현재 광범위하게 사용되고 있다. 안면 부에서 필러 주입을 가장 많이 하는 부위는 코와 nasolabial fold로 이비인후과 영역에 밀접한 부위이다. 시술이 간단 하지만 vascular compromise로 인한 부작용이 발

생하면 치명적인 문제가 야기될 수 있기 때문에 그 부작용의 양상과 기전, 그리고 그 치료 방법에 대해 논하고자 한다. **방법:** 2010년 6월부터 2018년 12월까지 필러 주입 후 발생한 vascular compromise 진단 하 5일 이내에 본원을 방문한 98명의 환자를 대상으로 하였다. 임상양상을 통해 동맥성 (27명)과 비 동맥성 (71명)으로 구분하였으며, 그 진행 양상과 결과에 대해 분석하였다. **결과:** 동맥성 (27명)으로 모든 환자에서 7일 이내에 심한 abrasion 및 eschar가 발생하였다. 빠르게 진행하며 집중 치료에도 모든 환자에서 전체 또는 일부분에서 scar와 contracture가 발생하였다. 비 동맥성 (71명)의 경우 초기 수포와 홍반이 발생하고 피부색이 푸르스름한 양상을 나타내며 시간이 지나면서 피부 색이 점점 검붉게 변하고 abrasion 또는 ulceration이 발생하기도 하였다. 비 동맥성에서 부분적으로 병변이 발생한 경우가 ( $\leq 2$  nasal subunit) 광범위하게 병변이 발생한 경우 ( $> 2$  nasal subunit)보다 집중적 치료 후 예후가 좋지만 동맥성에서는 범위와 상관없이 모두 예후가 좋지 않았다. **결론:** 필러 주입은 간단하지만 혈관과 연관된 부작용이 발생할 경우 코의 괴사 및 실명 등의 심각한 부작용을 야기한다. 임상 양상에 따라 동맥성과 비 동맥성을 나누어 보았고 동맥성의 경우 나쁜 예후를 예상할 수 있다. 초기 적극 적인 치료를 통해 부작용의 범위를 최소한으로 줄이는 것이 중요하며 코의 변형이 온 경우에는 그에 맞는 적절한 치료를 진행해야 한다.

#### RHOP-35 15:10~15:20

### ANALYSIS OF CAUSES AND SITES OF THE NASAL SEPTAL SYNECHIAE AND PREDICTORS OF GENERAL ANESTHESIA FOR CORRECTION

DEPARTMENT OF OTORHINOLARYNGOLOGY, EULJI UNIVERSITY SCHOOL OF MEDICINE, EULJI MEDICAL CENTER

MYOUNG-SU CHOI, KUDAMO SONG

**목적:** Nasal septal synechiae are abnormal bridges of the inflamed and adherent mucosa of septum, which may cause nasal obstruction. Several factors, such as

adhesion area and sites, can cause severe nasal congestion, and may choose surgical methods. The aim of this study is to assess common causes, sites of septal synechiae and to determine the factors of general anesthesia to correct it. **방법:** We retrospectively reviewed charts of those who diagnosed with nasal septal synechiae and treated surgically between March 2009 and June 2019. Forty-eight patients were enrolled this study. We compared the acoustic rhinometry, adhesion area and sites, combined septoplasty, and NOSE scales between general anesthesia group (GAG) and office group (OG). **결과:** Totally, 48 patients (33 males, 15 females) were included this study and 30 patients were treated in office (OG) and 18 patients in operating room (GAG). The causes of synechiae were nasal bone fracture 26 (54%), ESS 9 (18.7%), TSA 4 (8.3%), septoplasty 4 (8.3%), and nasal packing 2 (4%). Prevalent adhesion sites of septum were head of inferior turbinate (49%), upper lateral nasal wall (35.6%), and middle turbinate (8.5%). The mean adhesion areas of the GAG and OG were  $69.8 \pm 54$  cm<sup>2</sup> and  $32.6 \pm 19.8$  cm<sup>2</sup>, respectively ( $p=0.011$ ), the mean preoperative NOSE score of the GAG and OG were 12.6 and 9.5, respectively ( $p=0.042$ ), combined septoplasty of the GAG and OG were 10 (55.6%) and 3 (10%), respectively (0.002). The AUC of ROC curve for adhesion area for general anesthesia was 0.731 ( $p=0.008$ ). The cut-off value of adhesion area for general anesthesia was 32.5 cm<sup>2</sup> (sensitivity 66.7%, specificity 70%). **결론:** In conclusion, our results indicate that prevalent causes and sites of nasal septal synechiae. General anesthesia was needed for correction synechiae when adhesion areas was large and preoperative NOSE score was high and accompanying septal deviation.

## PLASTY

SHIMMIAN RHINOPLASTY CLINIC

SANGMIN HYUN, DONG-HAK JUNG

**목적:** 코 성형은 코의 구조적인 변형을 교정함으로써 코의 기능과 외적 모습을 향상 시키는 것을 목적으로 한다. 코의 연골 또는 골부의 변형을 모두 교정하였음에도 불구하고 skin soft tissue envelop의 문제가 발생하였을 경우 그 결과 가 만족스럽지 않은 경우가 많다. 저자는 코 성형 후 skin soft tissue envelop의 변형이 온 경우 triamcinolone injection을 통한 교정 방법에 대해 소개하고자 한다. **방법:** 2017년 9월부터 2019년 3월까지 코 성형 후 skin soft tissue envelop의 문제로 triamcinolone injection을 받은 14명의 환자를 대상으로 조사하였다. 수 술 후 2-3개월째부터 injection을 시작하였고 4-6주 간격으로 1에서 3회까지 경과에 따라 주사하였다. **결과:** 14명의 환자 중 9명은 수술 후 코끝이 다시 커지는 re-growing bulbosity로, 4명은 코끝의 asymmetry, 그리고 1명은 수술 후 polybeak deformity가 발생하여 injection을 시행하였다. 이 중 8명은 triamcinolone injection을 1회 맞 았고, 3명은 2회, 3명은 3회까지 맞았다. 14명의 환자 중 12명은 주사 후 좋은 결과를 보였으며, 2명의 경우 큰 호전이 없어 수술 후 6개월 째 재수술을 하였다. Injection에 따른 다른 부작용을 호소하는 환자는 없었다. **결론:** 코 성형은 주로 코의 구조적인 변형을 통해 기능과 외형의 변화를 주지만 수 술 후 skin soft tissue envelop의 예기치 못한 변형으로 불만족을 호소하는 경우가 있다. Triamcinolone injection은 수술 후 발생한 skin soft tissue envelop의 문제를 간단 하면서 효과적으로 개선할 수 있는 방법으로 생각된다.

**RHOP-36 15:20~15:30**

**CORRECTION OF THE SOFT TISSUE PROBLEM USING TRIAMCINOLONE INJECTION AFTER RHINO-**

## RHOP 7

부비동염 I

15:50~16:50 • 세미나실3

Chairperson(s) : 김명구(성균관의대), 박용진(가톨릭의대)

## RHOP-37 15:50~16:00

IS ANTIHISTAMINE ASSOCIATED WITH SINUSITIS?  
A NATIONWIDE 10-YEAR COHORT STUDYDEPARTMENT OF OTORHINOLARYNGOLOGY, CHONBUK  
NATIONAL UNIVERSITY MEDICAL SCHOOL, JEONJU, SOUTH  
KOREAJONG SEUNG KIM, SAM HYUN KWON, CHA DONG  
YEO, EUN JUNG LEE, YEON SEOK YU

**목적:** Antihistamines are among the most prescribed medicines in otorhinolaryngology. This drug is excellent for rhinorrhea, sneezing and itching, however, it has a debatable effect in rhinosinusitis. At this point, it is useful to examine the relationship between antihistamine and the incidence of sinusitis based on large-cohort data analysis. **방법:** Primary endpoint was the occurrence of sinusitis. The antihistamine (AH) group consisted of patients who were diagnosed with allergic rhinitis (AR) between January 1, 2003 and December 31, 2003, taking at least one dose of antihistamine. All studies were performed using KNHIS-NSC data from Korea's health insurance service. non-antihistamine (non-AH) group of patients who did not take antihistamines was obtained by 1:4 propensity score matching. **결과:** The adjusted hazard ratio for the sinusitis in the AH group was 1.53 [95% CI: 1.36-1.72] compared with the non-AH group. Sinusitis was more frequent in women (HR: 1.34), and less frequent the older the age (HR: 0.74, 0.58, 0.46, respectively) after exposure to antihistamine. **결**

**론:** Antihistamines are probably the most prescribed medicines in the rhinologic area. But as all things have advantages and disadvantages, this large-scale longitudinal study should help clinicians to be aware that antihistamines can help alleviate allergic symptoms, but they can also aggravate and cause sinusitis.

## RHOP-38 16:00~16:10

REVISITING THE CLINICAL SCORING SYSTEM FOR  
THE PROGNOSIS OF CHRONIC RHINOSINUSITIS  
WITH NASAL POLYPS<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD  
AND NECK SURGERY, BORAMAE MEDICAL CENTER,  
SEOUL METROPOLITAN GOVERNMENT-SEOUL  
NATIONAL UNIVERSITY, SEOUL, KOREA, <sup>2</sup>DEPARTMENT  
OF OTORHINOLARYNGOLOGY, ARMED FORCES CAPITAL  
HOSPITAL, SEONGNAM, KOREA

JIN YOUP KIM

**목적:** To evaluate the Japanese Epidemiological Survey of Refractory Eosinophilic Chronic Rhinosinusitis (JESREC) classification, a clinical scoring system, for predicting disease control status in chronic rhinosinusitis with nasal polyps (CRSwNP) and to investigate prognostic factors. **방법:** In total, 134 CRSwNP patients who underwent functional endoscopic sinus surgery after maximal medical treatment were enrolled. These patients were categorized into four groups according to JESREC classification: 1) non-eosinophilic CRSwNP (non-ECRSwNP), 2) mild eosinophilic CRSwNP (ECRSwNP), 3) moderate ECRSwNP, and 4) severe ECRSwNP. Disease control status among the patients was evaluated at 1 year after surgery, and the patients were divided into two groups (disease-controlled and disease-uncontrolled groups) for the investigation of prognostic factors. **결과:** There was no significant difference in disease control status between non-ECRSwNP and ECRSwNP groups ( $p =$



0.970). Age, Lund-Mackay CT scores, global osteitis scores, tissue neutrophil count, and tissue eosinophil count were associated with disease control status. In subgroup analysis of the non-ECRSwNP group, only high tissue neutrophil count was related with disease control status, whereas for the ECRSwNP group, young age, high Lund-Mackay CT scores, high global osteitis scores, and high tissue and blood eosinophil counts were associated with disease control status. **결론:** No difference in disease control status was identified between non-ECRSwNP and ECRSwNP cases. Tissue neutrophilia, however, appeared to be associated with disease control status in non-ECRSwNP cases, whereas tissue and blood eosinophilia was associated with ECRSwNP cases.

#### RHOP-39 16:10~16:20

### RELATIONSHIP OF CHRONIC RHINOSINUSITIS WITH ASTHMA, MYOCARDIAL INFARCTION, STROKE, ANXIETY, AND DEPRESSION

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY AND BIOMEDICAL INFORMATICS, COLLEGE OF MEDICINE, KONYANG UNIVERSITY, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, BORAMAE MEDICAL CENTER, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHUNCHEON SACRED HEART HOSPITAL, HALLYM UNIVERSITY COLLEGE OF MEDICINE

JONG-YEUP KIM<sup>1</sup>, INSEOK KO<sup>1</sup>, DAE WOO KIM<sup>2</sup>, DONG-KYU KIM<sup>3</sup>

**목적:** Chronic rhinosinusitis (CRS) is a common chronic inflammatory disease of the nose and paranasal sinuses. It often has a high burden and is difficult to treat due to comorbidities. However, no population-based, long-term longitudinal study has investigated the relationship between CRS and its co-

morbidities. Therefore, using a representative sample, we investigated the potential relationship between CRS and comorbidities—asthma, acute myocardial infarction (AMI), stroke, anxiety disorder, and depression. **방법:** A total of 1,025,340 patients from the Korean National Health Insurance Service database from 2002–2013, including 14,762 patients with CRS and 29,524 without CRS was used for this study. A 1:2 propensity score matching was performed using the nearest neighbor matching method and sociodemographic factors and enrollment year. Cox-proportional hazards model was used to analyze the hazard ratio (HR) of CRS for asthma, AMI, stroke, anxiety disorder, and depression). **결과:** The incidence of asthma, AMI, and stroke were 71.1, 3.1, and 7.7 per 1000 person-years in CRS patients, respectively. The adjusted HRs of asthma, AMI, and stroke were 2.06 (95% confidence interval [CI] 2.00–2.13), 1.29 (95% CI, 1.15–1.44), and 1.16 (95% CI, 1.08–1.24), respectively, in CRS versus non-CRS patients. The incidence of anxiety disorder and depression in CRS patients was 42.1 and 24.2 per 1000 person-years, respectively. The adjusted HRs of anxiety disorder (HR, 1.54; 95% CI, 1.49–1.60) and depression (HR, 1.50; 95% CI, 1.44–1.57) were significantly greater in patients with versus without CRS. **결론:** CRS is associated with an increased incidence of asthma, AMI, stroke, anxiety disorder, and depression. Therefore, we suggest that clinicians should monitor CRS patients carefully, and optimize management as a means to potentially decrease these other associated comorbid conditions.

#### RHOP-40 16:20~16:30

### EOSINOPHIL-TO-LYMPHOCYTE RATIO AND TISSUE REMODELING MARKERS IN CHRONIC RHINOSINUSITIS - CLINICAL AND PATHOLOGIC FEATURES

DEPARTMENT OF OTORHINOLARYNGOLOGY, EULJI

UNIVERSITY HOSPITAL, EULJI UNIVERSITY SCHOOL OF MEDICINE

SU JIN KIM, HO YUN LEE, MYOUNG SU CHOI, DONG SIK CHANG

**목적:** Tissue eosinophilia is known to be a marker of poor prognostic factor in chronic rhinosinusitis (CRS). Recently, eosinophil-to-lymphocyte-ratio (ELR) has been proposed as markers of inflammation. In this study, we aimed to analyze clinical and pathologic findings including ELR and tissue remodeling markers and then confirm their clinical implications in CRS for predicting prognosis. **방법:** Ninety-eight patients with CRS who underwent endoscopic sinus surgery with biopsy were enrolled. Patient characteristics, pathologic findings (inflammatory cell count, tissue remodeling markers including squamous metaplasia, basement membrane thickening, stromal edema and fibrosis), complete blood count with differential, allergic test, Lund-Mackay score (LMS), and final treatment outcome were analyzed. **결과:** Tissue ELR was positively correlated with tissue eosinophils, blood eosinophils, and blood ELR ( $p < 0.05$ ). In contrast, tissue ELR was negatively correlated with neutrophils in both tissue and blood. Higher degree of tissue remodeling was associated with higher tissue eosinophils and tissue ELR ( $p < 0.05$ ). Of the accompanying diseases, patients who had diabetes mellitus showed lower tissue eosinophils and ELR, but higher tissue neutrophils ( $p < 0.05$ ). Tissue ELR showed a positive correlation with both LMS and extent of surgery ( $p < 0.05$ ). However, final outcome was not associated with tissue ELR nor tissue remodeling markers ( $p > 0.05$ ). **결론:** Though tissue ELR or remodeling markers seems to be associated with poor prognostic factors in CRS, their clinical implications for predicting the final prognosis may be limited.

RHOP-41 16:30~16:40

## BIDIRECTIONAL ASSOCIATION BETWEEN ASTHMA AND CHRONIC RHINOSINUSITIS: TWO LONGITUDINAL FOLLOW-UP STUDIES USING A NATIONAL SAMPLE COHORT

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, CHEONAN HOSPITAL, <sup>2</sup>HALLYM DATA SCIENCE LABORATORY, HALLYM UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>GRADUATE SCHOOL OF PUBLIC HEALTH, SEOUL NATIONAL UNIVERSITY, <sup>4</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, HALLYM UNIVERSITY COLLEGE OF MEDICINE, <sup>5</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, DANKOOK UNIVERSITY COLLEGE OF MEDICINE, <sup>6</sup>BECKMAN LASER INSTITUTE KOREA, DANKOOK UNIVERSITY COLLEGE OF MEDICINE

GWANGHUI RYU<sup>1</sup>, CHANYANG MIN<sup>2,3</sup>, BUMJUNG PARK<sup>4</sup>, HYU GEUN CHOI<sup>4</sup>, JI-HUN MO<sup>5,6</sup>

**목적:** The aim of this study was to evaluate the association between asthma and chronic rhinosinusitis (CRS) using a national sample cohort of Korean population. **방법:** Data were collected from the Korean Health Insurance Review and Assessment Service-National Sample Cohort between 2002 and 2013. Two different case-control cohorts were designed. Asthma patients were matched at a 1:1 ratio with 204,119 control I, and CRS patients were matched at a 1:4 ratio with 124,020 control II. A stratified Cox-proportional hazards model was used to analyze the hazard ratio (HR) of CRS in asthma and that of asthma in CRS. In these analyses, age, sex, income, and region of residence were stratified, and the 95% confidence interval (CI) was calculated. **결과:** The adjusted hazard ratio (HR) of CRS was 1.74 (95% CI = 1.67-1.80) in the asthma group ( $P < 0.001$ , Table 2). That of CRS with polyp was 1.55 (95% CI = 1.36-1.78), and that of CRS without polyp was 1.74 (95% CI = 1.67-1.81)

compared to control I. The adjusted HR of asthma was 1.85 (95% CI = 1.80–1.91) in the CRS group ( $P = 0.001$ , Table 4). That were 1.96 (95% CI = 1.79–2.15) in CRS with polyp, and 1.84 (95% CI = 1.78–1.90) in CRS without polyp group compared to control II. In the subgroup analysis according to age and sex, HR of CRS in the asthma group was the highest in 20–39 years old men (HR = 2.41; 95% CI = 1.97–2.96), and that of asthma in the CRS group was same as the asthma group (HR = 2.40; 95% CI = 2.18–2.63). **결론:** CRS and asthma had bidirectional influence each other. CRS increased the risk of asthma, and asthma increased the risk of CRS, especially in young-aged group of men.

#### RHOP-42 16:40~16:50

### THE METHOD FOR NEUTROPHILIC POLYP CLASSIFICATION AND ITS CLINICAL IMPLICATION

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY DANKOOK UNIVERSITY, COLLEGE OF MEDICINE, <sup>2</sup>BECKMAN LASER INSTITUTE KOREA, DANKOOK UNIVERSITY, <sup>3</sup>LASER TRANSLATIONAL CLINICAL TRIAL CENTER, DANKOOK UNIVERSITY HOSPITAL

KWANG-HYUN BYUN<sup>1,2,3</sup>, SANG-HYUB KIM<sup>1,2,3</sup>, JI-HYE KIM<sup>2,3</sup>, EUN-HEE KIM<sup>2,3</sup>, JUN-SANG BAE<sup>2,3</sup>, YOUNG-JUN CHUNG<sup>1,2,3</sup>, JI-HUN MO<sup>1,2,3</sup>

**목적:** 비용은 호산구와 호중구를 기준으로 구분하는데 호중구 cell counts 에는 다양한 방법이 사용되고 있다. 또 호중구 비용에 대한 정의 역시 다양하여 우리는 중성구 cell count 을 하는데 있어 적합한 방법을 알아보고 호중구 비용의 적합한 기준을 알아보고자 하였다  
**방법:** 2014.08 부터 2018.09 까지 본원에서 비용을 동반한 만성 비부비동염 으로 비내시경 수술을 받은 207 명의 환자를 대상으로 하였다. 비용은 hematoxylin and eosin(H&E), human neutrophil elastase(HNE), myeloperoxidase(MPO) 3가지 염색 후 광학현미경(x400)에서 중성구 cell counting 을 하여 비교하였다. 호중구

비용의 정의는 20 counts/HPF, 호중구 비율(1%) 두 가지 기준을 3가지 염색법에 모두 적용하여 각각에 대하여 방법의 용이성 및 임상양상을 비교하여 보았다. 호중구 비용의 분류에 대한 최적화가 이루어진 이후 이를 적용하여 비용을 호산구 비용, 호중구 비용, 호산구-호중구 비용, 비 호산구-호중구 비용으로 구분하여 각각에 대한 치료적 예후와 임상적 특징을 살펴해보았다. **결과:** 염색법의 경우 H&E 염색에서는 호중구, 호산구의 형태 구분에 있어 모호함이 발생하여 호중구의 cell count 에 under evaluation 이 발생하였으며, MPO 염색의 경우에는 특이도가 낮아 over evaluation 되는 경향을 보였으며, HNE염색이 가장 적합하였다. 호중구 비용의 정의에 관련하여서 1%와 20counts/HPF 중 20 counts/HPF가 용이하고 임상양상에 있어 두 분류방법에 차이가 없어 20counts/HPF를 택하게 되었다. HNE 면역조직염색과 호중구 20 counts/HPF를 기준으로 비용을 분류할 경우 Lund-kennedy total score 및 polyp score에서 네 군(호산구 비용, 호중구 비용, 호산구-호중구 비용, 비 호산구-호중구 비용)간 통계적으로 의미있는 차이가 있었으며( $P < 0.05$ ), 특히 호산구 비용 보다 호산구-호중구 비용이 점수가 낮아 나쁜 예후를 시사하였다. **결론:** HNE 면역조직염색법이 3가지 염색법 중 가장 호중구 cell count에 적합하였으며, 호중구 20 counts/HPF 기준의 경우 실험의 편의성 측면과 수술 후 예후 예측인자 분석에서 가장 적합한 결과를 보였다. 특히, 호중구-호산구의 예후가 호산구 보다 나쁘게 나타남으로 호중구의 영향을 비용의 예후에 고려해야 함을 알 수 있었다.

## HNOP 1

두경부/갑상선/후두음성 기초 및 중개연구 I

07:50~08:50 • 그랜드홀2

Chairperson(s) : 노종렬(울산의대), 이승원(순천향의대)

### HNOP-01 07:50~08:00

#### ESTABLISHMENT OF MURINE SYNGENEIC MODEL OF HEAD AND NECK CANCER: A PRECLINICAL MODEL FOR TUMOR IMMUNOTHERAPY

DEPARTMENT OF OTOLARYNGOLOGY, AJOU UNIVERSITY  
SCHOOL OF MEDICINE

JEON YEOB JANG, BOK-SOON LEE, CHORONG SEO,  
HUANG MEI, YOO SEOB SHIN, CHUL-HO KIM

**목적:** This study aimed to develop and validate the murine syngeneic model of head and neck cancer to provide a preclinical model for tumor immunotherapy.

**방법:** DMBA (7,12-Dimethylbenz(a)anthracene) were applied on the murine buccal mucosa twice a week for about 28 weeks to develop carcinogen-induced buccal cancer. Single cell suspensions from the harvested buccal cancer tissue were isolated and expanded and further characterized. The isolated cancer cells were xenografted into the murine buccal area to identify development of the squamous cell carcinoma. The established murine OSCC cell lines (Ajou oral cancer cell line, AOC) were subjected to next-generation sequencing (NGS) to define their mutational landscape.

**결과:** Among 19 isolated AOC cells, 4 cells (AOC-3, AOC-3-LN, AOC-11, AOC-11-LN) were identified to induce squamous cell carcinoma upon xenograft. Despite differences in species and carcinogen exposure, the NGS results identified that many of the same mutated genes implicated in humans were altered in AOC cell lines, revealing highly conserved pathways

on oral cancer tumorigenesis. Of note, immunohistochemical staining for the xenograft tumor showed the accumulation of the CD8-positive T cells inside of the tumor microenvironment indicating that the newly developed xenograft model is immunologically “hot tumor”. Finally, administration of anti-PD-1 blocking antibody resulted in the decreases of the tumor size showing the reliable responses for the immunotherapy.

**결론:** Collectively, we report the successful establishment of the murine syngeneic head and neck cancer model. This newly developed model system is expected to provide as a preclinical platform for studying tumor immunology and immunotherapy in head and neck cancer.

### HNOP-02 08:00~08:10

#### URBAN PARTICULATE MATTER-INDUCED INFLAMMATORY MECHANISM IN PHARYNGEAL CELLS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY MEDICINE

JIAN KIM, NU-RI IM, BYOUNGJAE KIM, KWANG-YOON JUNG, SOON-YOUNG KWON, JEONG-SOO WOO, JAE-GU CHO, KYOUNG HO OH, SEUNG-KUK BAEK

**목적:** As urbanization progresses tremendously, the urban particulate matter (UPM) problem has emerged. Recently it has been reported that UPM is associated with an increased risk of airway inflammation. Since it is not clear what effect the UPM has on the pharynx and what mechanisms are involved in its response to the UPM, the purpose of the study is to investigate the possibility and mechanism of UPM-induced pharyngitis. **방법:** The various amounts of UPM were applied into pharynx in-vitro model using FaDu cell-line and then the changes of the inflammatory cytokines including interleukin-6, 8, and 1β were evaluated. **결과:** The mRNA expressions of the inflammatory

cytokines increased according to the concentrations of UPM. However, the intracellular protein level of interleukin-8 was significantly upregulated based on UPM concentration but not in interleukin-6 and 1 $\beta$ . In contrast of that, interleukin 6 and 1 $\beta$  increased and interleukin-8 decreased in the ELISA study using the culture media. **결론:** In UPM-induced pharyngeal inflammation, all of the transcription levels of the inflammatory cytokines increased based on UPM concentration. Whereas the extracellular secretion of inflammatory cytokines was different according to the type of cytokines. These contrasting results indicate that UPM induced differential regulation of cytokines and suggest that specific inhibition method for individual cytokine should be applied to reduce UPM-induced inflammation.

#### HNOP-03 08:10~08:20

### ANALYSIS FOR PRESSURE AND MATERIAL DISTRIBUTION DURING INJECTION LARYNGOPLASTY A PRELIMINARY STUDY

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MIN-SU KIM<sup>1</sup>, SEONGMIN AN<sup>2</sup>, SEUL KI SONG<sup>3</sup>, SUNG JOON PARK<sup>4</sup>, SUNGJUN HAN<sup>4</sup>, SONGWAN JIN<sup>2</sup>, TACK-KYUN KWON<sup>3</sup>

**목적:** To gain a better understanding of the injection material distribution during injection laryngoplasty (IL) and to establish an experimental model to create

a standardized IL protocol for beginners in the future.

**방법:** We analyzed continuous injection pressures using a pressure pump. We assessed the spread patterns of injection materials via serial micro computed tomography (CT) and a histologic analysis. This experimental study used 12 excised canine larynges. We used six larynges each to assess IL in the middle and posterior portions of the thyroarytenoid (TA) muscle. At each portion of the TA muscle, three larynges were used for the serial micro CT experiment and three larynges were used for the pressure measurement experiment.

**결과:** The injection pressures initially increased rapidly but then remained in a steady state. In the middle portion of the TA muscle, the injection materials expanded in various directions within the TA muscle. In the posterior portion of the TA muscle, the injection materials often burst into the airway. All six ILs in the middle portion of the muscle were performed without interruption. However, all six ILs in the posterior portion of the muscle could barely advance once the ILs reached 0.4 ml. Moreover, the materials ruptured into the airway in four of the six ILs in the posterior portion of the TA muscle. **결론:** We successfully developed an experimental model to qualitatively and quantitatively evaluate injection pressure changes and injection material distributions.

#### HNOP-04 08:20~08:30

### CHANGE OF CIRCULATING TUMOR DNA IN SALIVA AND PLASMA FOLLOWING RECURRENCE OR METASTASIS IN AN ORTHOTOPIC HEAD AND NECK CANCER MOUSE MODEL

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD & NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY, SEOUL, KOREA, <sup>2</sup>DEPARTMENT OF PATHOLOGY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY, SEOUL, KOREA

YOUNG CHAN LEE<sup>1</sup>, YU JIN YOON<sup>1</sup>, KYU YOUN WON<sup>2</sup>, YOUNG-GYU EUN<sup>1</sup>

**목적:** Various saliva-based biomarkers for the head and neck carcinoma (HNC) have been proposed, but there has been little progress in understanding salivary circulating tumor DNA(ctDNA) biology in detail. In this proof-of-concept study, in order to determine whether ctDNA in saliva can act as a biomarker for HNC, we assessed ctDNA in both the saliva and plasma of an orthotopic HNC mouse model. **방법:** We developed recurrence or cervical metastasis after tongue cancer resection in the mouse model. We collected blood and saliva at baseline, 3, 7, and 14 days post-tumor cell injection, post-surgery, and at the establishment of recurrence or metastasis. We performed quantitative PCR to quantify human origin DNA (hLINE) in samples to assess the amount of ctDNA in the saliva and plasma. **결과:** We developed an orthotopic HNC mouse model, in which recurrence or cervical metastasis occurred within 18-76 days after surgical resection. We found that the concentration of salivary hLINE increased as the cancer developed and decreased after surgery. Plasma hLINE concentrations were significantly elevated in mice with metastasis. The presence of tongue cancer recurrence in the mice was more correlated with hLINE concentration in saliva than in plasma. In addition, salivary hLINE concentration was significantly correlated with the apoptosis index of tongue cancer. **결론:** In our orthotopic model, salivary ctDNA better reflected tumor development and recurrence than plasma ctDNA. However, plasma ctDNA may be useful for detection of metastasis. These findings allow for future studies focused on development of salivary ctDNA biomarkers.

HNOP-05 08:30~08:40

#### APPLICATION OF ELECTRICAL IMPEDANCE SPECTROSCOPY ON A NEEDLE FOR DIAGNOSIS OF THE METASTATIC LYMPH NODE IN THE NECK - PRE-

#### LIMINARY RESULT

A DEPARTMENT OF OTOLARYNGOLOGY-HNS, CHONBUK NATIONAL UNIVERSITY HOSPITAL

YONG-TAE HONG, JOHO YUN, JONG-HYUN LEE, KI-HWAN HONG

**목적:** Cervical lymphadenopathy is a common clinical presentation encountered in many clinics. With a high probability, lymphadenopathy is regarded as the first sign of malignancy in most of the patients with head and neck cancer. Hence, early diagnosis is crucial to prevent aggravation of disease. To improve the diagnostic accuracy of metastatic lymph node during fine needle aspiration (FNA) procedures, electrical impedance spectroscopy (EIS) was employed to study human normal and cancerous lymph nodes. **방법:** Prior to the ex vivo experiment using human tissues, the discrimination capability of the Electrodes on a Needle (EoN) was evaluated using various conductivity levels of solutions. Subsequently, the electrical impedance of samples collected from 8 patients were analyzed in the sweeping frequency range from 1 Hz to 1 MHz. **결과:** Prior to the ex vivo experiment using human tissues, the discrimination capability of the Electrodes on a Needle (EoN) was evaluated using various conductivity levels of solutions. Subsequently, the electrical impedance of samples collected from 8 patients were analyzed in the sweeping frequency range from 1 Hz to 1 MHz. **결론:** In the present work, we report the novel diagnostic tool, EoN to discriminate between human normal and cancerous metastatic lymph node by analyzing electrical impedance, normalized impedance, discrimination index. Once the discrimination capability of EoN is proven through animal and human in-vivo experiment, we believe that the EoN could reduce unnecessary operations with its associated morbidity. Furthermore, it can be utilized intraoperatively to determine the extent of surgery required to dissect more levels of lymphatic channels in the neck, to preserve more tissue that is normal.

**HNOP-06 08:40~08:50****WHAT KINDS OF LARYNGEAL DISEASES CAN BE TREATED WITH KTP (POTASSIUM- TITANYL-PHOSPHATE)LASER?**

DEPARTMENT OF OTOLARYNGOLOGY - HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, BUCHEON, KOREA

SEUNG-WON LEE, KI-NAM PARK, JAE-WOOK KIM, MYUNG-JIN BAN, JAE-HONG PARK

**목적:** 다양한 양성, 악성 후두질환에서의 KTP레이저 수술의 적응증 및 치료결과에 대한 전향적 연구 결과이다 **방법:** 2015년 9월부터 2018년 12월까지 국소마취 혹은 전신마취 하 KTP 레이저 후 두 수술을 시행 받은 환자 중 6개월 이상 추적관찰이 가능했던 379명 환자의 치료 결과를 분석하였다 **결과:** 총 379명의 환자 중 350명의 환자는 국소마취 하, 29명의 환자는 전신마취 하 수술을 시행하였다. 국소마취 하 KTP 레이저 수술은 vocal polyp 192 (54.9%), 음성치료에 반응하지 않는 vocal nodule 54 (15.4%), 후두미세수술 후 재발한 touch up procedure 26 (7.4%), vocal fold leukoplakia 19 (5.4%), contact granuloma 19 (5.4%), reinke edema 15 (4.3%), intracordal cyst 12 (3.4%), laryngeal papilloma 9 (2.6%), 기타 4 (1.1%) 였다. 전신마취 하 KTP 레이저 수술은 sulcus vocalis 22례, glottis ca KTP laser cordectomy 7례 였다. 추적관찰 중 vocal polyp 6.8% (13/192), vocal nodule 7.4% (4/54)의 재발율을 보였다 **결론:** 성대 폴립, 결절과 같은 양성 후두질환뿐 아니라 성대 백반증, 성대구증, 후 두유두종, 성대암 등 다양한 질환에 KTP 레이저 수술이 적용 가능하였다

**HNOP 2**

갑상선 I

07:50~08:50 • 세미나실3

Chairperson(s) : 송시연(영남의대), 박정제(경상의대)

**HNOP-07 07:50~08:00****DEVELOPMENT OF SMART GLASS DEVICE FOR REAL-TIME PARATHYROID DETECTION USING AUTOFLUORESCENCE**

DEPARTMENT OF OTOLARYNGOLOGY, NATIONAL CANCER CENTER

JUNGIRL SEOK, CHANG HWAN RYU, YUH-S JUNG, JUNSUN RYU

**목적:** 갑상선암의 삶의 질을 떨어뜨리는 주요한 원인 중 하나로 수술 중 부갑상선 손실로 인한 부갑상선 기능 저하증이 있으며, 경험이 부족한 의사에 의해 갑상선 절제술이 시행될 경우 저칼슘혈증이 초래될 가능성이 높음이 보고되어 있다. 이를 해결하기 위해, 부갑상선의 자가형광 검출을 이용하여 수술 중 부갑상선을 보존하려는 연구가 활발히 이루어지고 있으며, 이에 본 기관에서는 효과적인 부갑상선의 검출을 위해 스마트 안경을 이용하여 수술자가 시야를 필드 내에 고정해둔 상태에서 부갑상선의 위치를 효과적으로 확인할 수 있는 기기 일체를 개발하여 이를 이용한 전향적 연구를 진행하였다. **방법:** 개발된 기기를 이용하여 2019년 3월 1일부터 2019년 3월 31일 까지 총 30명의 환자를 대상으로 수술 중 부갑상선 확인을 위한 전향적 연구를 진행하였다. 모든 수술은 숙련된 3명의 전문의에 의해 시행되었으며, 육안으로 부갑상선이 의심되는 조직에 대해 실시간 자가형광 검출을 이용한 확인을 시도하였다. 부갑상선 영상은 실시간 전송되는 스마트 글래스로 확인하였다. **결과:** 수술 중 부갑상선 검출 과정에 소요되는 시간은 2분 이내로, 스마트 안경을 이용하여 수술자는 지속적으로 수술 필드에서 시야를 고정하여

불필요한 조작 없이 안정적인 검출을 이루어낼 수 있었다. 집도의가 지방조직으로 생각했던 경우에 부갑상선으로 확인되어 손상을 예방한 경우도 존재하였다. 지방조직 등의 연부조직에 의해 근적외선이 제대로 도달하지 못하는 경우 검출률이 떨어지는 것을 확인하였다. **결론:** 자가형광탐지 및 스마트 안경을 이용한 실시간 부갑상선 검출은, 수술자가 고식적으로 찾아낸 부갑상선에 대한 확인이 필요할 때, 또는 뜻밖의 부갑상선 절제를 예방하는 것에 임상적 유용성을 확인하였다. 향후 이러한 과정을 통해 보존한 부갑상선이 실제 칼슘저하의 예방에 어느 한 결과를 미치는지 추 가적인 연구가 필요하겠다.

#### HNOP-08 08:00~08:10

### REMOTE ACCESS THYROIDECTOMY WITH OR WITHOUT ROBOT-ASSISTED NECK DISSECTION IN PEDIATRIC PATIENTS

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DA HEE KIM<sup>1</sup>, MIN SEOK KANG<sup>1</sup>, YOUNG MIN PARK<sup>1</sup>, JAE HONG PARK<sup>2</sup>, EUN CHANG CHOI<sup>1</sup>, JAE WON CHANG<sup>3</sup>, YOON WOO KOH<sup>1</sup>

**목적:** Pediatric thyroid cancer shows more frequent cervical node metastasis than adult thyroid cancer, even in differentiated thyroid carcinoma (DTC). Thus, cervical neck dissection often needs to be performed simultaneously with thyroidectomy. Here, we analyzed cases of robotic thyroidectomy with/without robot-assisted neck dissection (RAND) in pediatric patients. **방법:** Twenty-one pediatric patients (mean age 15.46years, minimum age 9) who underwent thyroid-

ectomy using endoscopic or robotic systems for DTC between July 2011 and May 2019 were retrospectively reviewed and evaluated. **결과:** For all of the patients, the operation was successfully performed without significant intraoperative complications or conversion to open or additional approaches. Of the 21 patients, 9 underwent endoscopic or robotic HT, 9 for robotic TT with RAND; and 3, robotic TT alone. The mean operation times of robotic TT with and that without RAND were  $298.2 \pm 64.1$  min and  $119.8 \pm 41.4$  min, respectively. No postoperative complications such as vocal cord palsy, seroma, hemorrhage, or hematoma, were observed. 8 out of 9 patients who underwent TT with RAND showed transient hypoparathyroidism, which was managed conservatively. The total numbers of cervical nodes retrieved from central compartment lymph node dissection and RAND were  $7.6 \pm 3.7$  and  $39.2 \pm 24.0$ , respectively; and the number of upper level lymph node retrieval tended to increase from transaxillary approach to retroauricular approach. During the follow-up period, no evidence of recurrence was observed. All the patients were satisfied with their cosmetic results. **결론:** Our experience suggests that robotic thyroidectomy with or without RAND is a feasible and safe alternative treatment that produces long term outstanding functional results for pediatric patients with DTC.

#### HNOP-09 08:10~08:20

### EXPRESSION OF SIRT GENE ON PAPILLARY THYROID MICRO-CARCINOMA AND ITS CLINICAL SIGNIFICANCE

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SEONGJUN WON<sup>1</sup>, JIN-PYEONG KIM<sup>2</sup>, JUNG-JE



PARK<sup>1</sup>

**목적:** The aim of this study was to evaluate the clinical significance of SIRT family expression in papillary thyroid micro-carcinoma (PTMC). **방법:** This retrospective study included 205 cases which were diagnosed with PTMC and underwent surgery between 2013 and 2017 in Gyeongsang National University Hospital. Their medical records were reviewed, and tissue samples were immunohistochemically stained with antibody to SIRT family (SIRT1-7). Univariate and multivariate logistic regression models were used to evaluate a significance of SIRT expression as independent predictors for lymph node metastasis. Additionally, Kaplan-Meier curves were used to plot recurrence-free survival, and uni/multivariate analyses were performed using Cox's proportional hazards regression model. **결과:** Uni/multivariate analyses showed that SIRT family expression didn't have a statistically significant meaning in cervical lymph node metastasis. SIRT 2 and SIRT 4 expression was related with a reduced recurrence-free survival ( $p=0.054$  and  $p=0.040$ ). **결론:** SIRT family expression in PTMC is not statistically associated with cervical lymph node metastasis. However, correlation between SIRT family and recurrence, especially SIRT 2 and 4, was statistically meaningful. As shown that some SIRT expression was related with recurrence, further research is needed to confirm this results and find a proper methods to apply clinically.

HNOP-10 08:20~08:30

### CLINICAL OUTCOMES IN PATIENTS WITH T4 PAPILLARY THYROID CANCER WHO HAD RECURRENT LARYNGEAL NERVE INVOLVEMENT

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**목적:** Pre-operative vocal cord palsy is a key indicator of locally invasive papillary thyroid cancer (PTC). The aim of this study was to evaluate the clinical outcomes and risk factors related with recurrence after thyroidectomy in T4 PTC patients with recurrent laryngeal nerve (RLN) involvement. **방법:** All patients who underwent thyroidectomy at the Pusan National University Hospital from January 2004 to December 2017 were investigated retrospectively. Pre-operative VCP patients and those who had confirmed RLN invasion during surgery were included. Clinical factors, recurrences, pathological findings were recorded. Univariate and multivariate Cox proportional hazard models were used to analyze the relationship between recurrence rate and factors. **결과:** Of the 72 patients, 37 (51%) had pre-operative VCP, 35 (49%) had post-operative VCP with intra-operatively confirmed RLN invasion. Thirty-two patients (44%) had right VCP, 39 (54%) had left VCP and 1 (1%) both. One case (1%), 48 (60%), 28 (39%) had hemi-thyroidectomy with CND, total thyroidectomy with CND, and total thyroidectomy with CND and lateral ND respectively. One case (1%), 13 (18%), 15 (21%) had invasion to larynx, trachea, and esophagus, respectively. Seventeen cases (23%) developed recurrence during follow-up (median 76 months), and 2 (3%) died of recurrence with anaplastic change in medical records. During the follow-up period, four patients (6%) were reported to have lung metastasis. Surgical extent or side of primary tumor did not differ significantly in terms of rate of recurrence ( $p>0.05$ ). Even the patients with organ invasion, tumor size, lymph node status did not differ recurrences ( $p>0.05$ ). Between the

pre-operative VCP group and the intra-operatively confirmed nerve invasion group, there was no difference in the rate of recurrence. **결론:** The prognosis of T4a PTC patients with RLN involvement was not very bad. However, disease extent, surgical extent, and location or size of primary tumor were not associated with recurrence.

#### HNOP-11 08:30~08:40

### ASSOCIATION BETWEEN CIRCULATING FIBROBLAST GROWTH FACTOR21 AND AGGRESSIVENESS IN THYROID CANCER

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GEONHO LEE<sup>1</sup>, YEA EUN KANG<sup>2</sup>, KUNHO SONG<sup>1</sup>, JAE-YOON KANG<sup>1</sup>, LIHUA LIU<sup>1</sup>, CHAN OH<sup>1</sup>, MI AE LIM<sup>1</sup>, HO-RYUN WON<sup>1</sup>, JAE WON CHANG<sup>1</sup>, MINHO SHONG<sup>2</sup>, BON SEOK KOO<sup>1</sup>

**목적:** Fibroblast growth factor (FGF)21 plays important roles in regulating glucose, lipid, and energy metabolism; however, its effects in tumors remain poorly understood. **방법:** To understand the role of FGF21 in regulating tumor aggressiveness in thyroid cancer, serum levels of FGF21 were measured in healthy subjects and patients with papillary thyroid cancer (PTC), and expression levels of FGF21, FGF receptors (FGFRs), and  $\beta$ -klotho (KLB) were investigated in human thyroid tissues. The cell viability, migrating cells, and invading cells were measured in papillary thyroid cancer (PTC) cells after treatment with recombinant FGF21. **결과:** Higher serum levels of FGF21 were found in patients with thyroid cancer than in control participants, and were significantly associated with body mass index (BMI), fasting glucose levels, tri-

glyceride levels, tumor stage, lymphovascular invasion, and recurrence. Serum FGF21 levels were positively correlated with the BMI in patients with PTC, and significantly associated with recurrence. Recombinant FGF21 led to tumor aggressiveness via activation of the FGFR signaling axis and epithelial-to-mesenchymal transition signaling in PTC cells, and AZD4547, an FGFR tyrosine kinase inhibitor, attenuated the effects of FGF21. **결론:** FGF21 may be a new biomarker for predicting tumor progression, and targeting FGFR may be a novel therapy for the treatment of obese patients with PTC.

#### HNOP-12 08:40~08:50

### SURVIVAL OUTCOMES AND PROGNOSIS OF LOCALLY INVASIVE PAPILLARY THYROID CARCINOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HANYANG UNIVERSITY COLLEGE OF MEDICINE

DONG HWAN KIM, SEOK HYUN CHO, KYUNG RAE KIM, CHANG MYEON SONG, YONG BAE JI, KYUNG TAE

**목적:** Maximal extrathyroidal extension (ETE) is known to be an important prognostic factor in papillary thyroid carcinoma (PTC). The aim of this study was to analyze the clinicopathologic characteristics and survival outcomes of PTC with maximal ETE. **방법:** We studied 1362 PTC patients who underwent thyroidectomy in a tertiary hospital between January 2000 and December 2016 retrospectively. Patients were classified into three groups: absence of ETE, and minimal and maximal ETE. We analyzed the survival outcome and recurrence rate according to the site of invasion. **결과:** Of the 1362 PTC patients, 634 patients had no ETE, 645 patients had minimal ETE and 83 patients had maximal ETE. Lymph node metastasis

occurred in 70% of the maximal group, 88.4% of the minimal ETE group and 25.2% of the no ETE group. Recurrences occurred in 27.7% of the maximal ETE group, 3.6% of the minimal ETE group, and 3.2% of the no ETE group. The 10-year disease free survival rate was significantly lower in the maximal ETE group compared to the no ETE and minimal ETE groups. In the maximal ETE group, the common invasion sites were the trachea, esophagus and recurrent laryngeal nerve. In the maximal ETE group, those who have tracheal invasion showed lower 10-year disease free survival rate compared to the other maximal ETE group. Also, in maximal ETE group, those who have multisite invasion showed lower 10-year disease free survival rate and lower 10-year overall survival rate compared with the single site invasion group. **결론:** PTC with maximal ETE had higher recurrence rate and lower survival compared with the no ETE or minimal ETE group. In the maximal ETE group, tracheal invasion and multisite invasions are related with poor survival and prognosis.

## HNOP 3

두경부/갑상선/후두음성 기초 및 중개연구 II

10:30~11:30 • 세미나실3

Chairperson(s) : 권성근(서울의대), 구본석(충남의대)

**HNOP-13 10:30~10:40**

### GDF15, THE PUTATIVE MITOKINE FACTOR, PROMOTES TUMOR PROGRESSION IN THYROID CANCER VIA STAT3 REGULATION

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METABOLISM, DEPARTMENT OF INTERNAL MEDICINE, CHUNGNAM NATIONAL UNIVERSITY, COLLEGE OF MEDICINE, <sup>3</sup>DEPARTMENT OF MEDICAL SCIENCE, COLLEGE OF MEDICINE, CHUNGNAM NATIONAL UNIVERSITY, DAEJEON, REPUBLIC OF KOREA <sup>3</sup>

HO-RYUN WON<sup>1</sup>, YEA EUN KANG<sup>2</sup>, LIHUA LIU<sup>3</sup>, CHAN OH<sup>3</sup>, MI AE LIM<sup>1</sup>, YANLI JIN<sup>3</sup>, GEUN HO SONG<sup>1</sup>, JAE IN JUNG<sup>1</sup>, JAE WON CHANG<sup>1</sup>, MINHO SHONG<sup>2</sup>, BON SEOK KOO<sup>1</sup>

**목적:** Mitochondrial dysfunction is an integral component during the initial stages of tumorigenesis. Growth differentiation factor 15 (GDF15) has recently been shown to have an important role in the regulation of mitochondrial function and in the pathogenesis of complex human diseases. Nevertheless, the role of GDF15 in thyroid tumorigenesis has yet to be determined. The aim of this study is to investigate the role of GDF15, the putative mitokine factor in thyroid tumorigenesis. **방법:** Expression levels of GDF15 was investigated using The Cancer Genome Atlas database. The role of GDF15 in tumor aggressiveness was investigated by analyzing the effects of knock-down of GDF15 on proliferation, migration, and invasion of thyroid cancer cells. Serum levels of GDF15 were measured in healthy subjects and patients with papillary thyroid cancer (PTC), and expression of GDF15 by IHC was investigated in PTC samples. To investigate the exact mechanism of GDF15 in thyroid cancer, both IPA analysis and GSEA analysis were performed using TCGA database and RNA seq data from Chungnam national university hospital. **결과:** TCGA data revealed the higher expression of GDF15 in tumor samples compared to in paired non-tumor samples. Thyroid cancer cells with knock-down of GDF15 revealed the decrease of proliferation, migration, and invasion compared to control cells via regulation of STAT3. Higher serum levels of GDF15 were found in patients with thyroid cancer than in control participants, and were significantly associated with

tumor stage, lymphovascular invasion, and recurrence. In addition, patients with high GDF15 expression by IHC revealed the aggressive phenotype compared to patients with low GDF15 expression. **결론:** The GDF15 have the role of regulating proliferation, migration, and invasion of thyroid cancer. These suggest that the GDF15 may have the role as the potential target to treat refractory thyroid cancer.

#### HNOP-14 10:40~10:50

### INJECTABLE MSC-SPHEROID HYDROGEL AS ANTI-FIBROSIS AGENT: IN VIVO ANIMAL STUDY FOR THE TREATMENT OF RADIATION-INDUCED UPPER DIGESTIVE TRACT FIBROSIS

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE  
EUN-JAE CHUNG, IN GUL KIM, HANA CHO, MIN KYUNG KIM, WON SHIK KIM, SEONG KEUN KWON, SOON-HYUN AHN

**목적:** The purpose of study is to determine the therapeutic efficacy of the cathechol-based hyaluronic acid (cth-HA) hydrogel encapsulated with human mesenchymal stem cells spheroids as anti-fibrosis agent in a mouse model of radiation-induced esophageal fibrosis **방법:** Stem cell spheroids were formed in the silicon elastomer-based concave microwells with 600  $\mu$ m diameters at a cell density of  $1 \times 10^6$  /mL. Radiation-induced fibrosis in the mouse esophagus was created by exposure to 10G doses twice at 1 week intervals. Prior to implantation (esophageal injection), the MSC spheroids were mixed evenly with the cth-HA hydrogel and mounted in a 1mL syringe. Then, cth-HA hydrogel containing MSC spheroids were injected at the damaged esophageal layer. At 4 and 12 weeks after injection, histological evaluation and expression level of fibrosis-related genes were ex-

amined. **결과:** MSC-spheroids were well maintained in cth-HA hydrogels and confirmed that most cells survived through live-dead staining. After esophageal injection of cth-HA hydrogel encapsulated MSC-spheroids, any inflammatory signs or adverse tissue reactions were not observed. From the masson's trichrome staining results at 4 & 12 weeks after injection, the thickness of IEL (inner esophageal layer) was significantly reduced in the hydrogel + MSC group compared with other experimental groups. While the saline and hydrogel only groups were loose and thick in esophageal muscle, the hydrogel + MSC group have shown bundles of tightly packed esophageal muscle by  $\alpha$ -SMA immunostaining. The qPCR analysis showed that epithelial genes tended to increase over time in hydrogel+MSC, and most of the fibrosis-related genes decreased significantly. **결론:** This work proposes a great potency of using cathechol-based hyaluronic acid hydrogel encapsulated with MSC spheroids as a promising therapy against radiation-induced upper digestive tract fibrosis

#### HNOP-15 10:50~11:00

### PERIOSTIN FACILITATES RADIORESISTANCE OF HEAD AND NECK CANCER CELLS VIA EPITHELIAL-TO-MESENCHYMAL TRANSITION

DEPARTMENT OF OTOLARYNGOLOGY, INSTITUTE OF HEALTH SCIENCES, COLLEGE OF MEDICINE, GYEONGSANG NATIONAL UNIVERSITY, JINJU, SOUTH KORE  
JUNG JE PARK, YOUNG-SOOL HAH, SOMI RYU, JIN PYEONG KIM, SEONGJUN WON

**목적:** Head and neck squamous cell carcinoma (HNSCC) is the most common and aggressive type of malignancy. Since radiotherapy is essential for advanced stage of HNSCC, it is important to understand epithelial-to-mesenchymal transition (EMT) process through which radiosensitive cells convert to

radioresistant cells. The aim of this study is to highlight the role of periostin (POSTN) as a key molecule which facilitates radioresistance of HNSCC via EMT.

**방법:** Expression of EMT genes including POSTN in radiosensitive and radioresistant cells were compared, and invasive activities were measured by invasion assay. TGF- $\beta$ , known to upregulate POSTN, were also assessed in terms of their expression levels in radiosensitive and - resistant cells. Protein levels of Erk and Akt between radiosensitive and radioresistant cells were compared since Erk and Akt/NF- $\kappa$ B signaling pathways were expected to play important roles the EMT process. **결과:** Higher mRNA expression levels of POSTN were detected in radioresistant HNSCC cells than radiosensitive cells, and significantly impaired invasive activities were shown once POSTN expression was suppressed by shPOSTN. We have shown the up-regulated protein expression of mesenchymal markers including POSTN and down-regulated expression of epithelial marker which strongly suggests that radioresistance of HNSCC is in association with EMT process. The highest level of TGF- $\beta$  2 was shown, and it implies the potential of TGF- $\beta$  2 which seems to most strongly upregulate POSTN. And then, markedly increased expression levels of Erk and Akt in radioresistant cells than radiosensitive cells were shown. **결론:** POSTN, transcriptionally up-regulated by TGF- $\beta$ , seems to activate Erk and Akt/NF- $\kappa$ B signaling pathways during the EMT process through which radiosensitive HNSCC cells convert to radioresistant cells. POSTN may be a key marker to predict the result and a potential target for therapeutic intervention against HNSCC which remains invasive even after radiotherapy.

**HNOP-16 11:00~11:10**

THE EFFECT OF SYSTEMIC ADMINISTRATION OF POLYDEOXYRIBONUCLEOTIDE AGAINST ISCH-

### EMIC INJURY - VALIDATION USING LASER SPECKLE IMAGING IN PREDICTING WOUND REPAIR

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE

JI HOON KIM, JEONG PYO BONG

**목적:** The purpose of this study was to apply polydeoxyribosenucleotide (PDRN) on ischemic skin flap of mice and monitor microcirculation changes with laser speckle contrast imaging (LSCI) system. **방법:** The 1 x 2 cm sized skin flap perfused by the inferior epigastric vessels was raised and pedicle was ligated to induce ischemic injury. After 6 hours, 6 mice were randomized to receive either PDRN (8 mg/kg/i.p.), or vehicle (0.8 ml saline) daily from the postoperative 1 day to 7th day. **결과:** The areas with skin necrosis distinctly showed a reduction of LSCI signal, which was in line with visual observations. The mean flap survival rates in PDRN group are significantly larger than control groups. The number of CD31 positively stained and VEGF expression were significantly higher in the PDRN group. **결론:** Our study suggests that PDRN administration has protective effect against the ischemic skin flap of mice. The LSCI system was able to visualize the blood flow changes of skin flap and represented an effective non-invasive real-time monitoring of perfusion in experimental animal model.

**HNOP-17 11:10~11:20**

### DIHYDROLIPOAMIDE DEHYDROGENASE CON-FERS CYSTINE DEPRIVATION-INDUCED FERROPTOSIS ON HEAD AND NECK CANCER

DEPARTMENT OF OTOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

KYUNG HWAN PARK, JI HYEON YOU, DAIHA SHIN, JAEWANG LEE, JONG-LYEL ROH

**목적:** Ferroptosis is iron-dependent, non-apoptotic cell death from lipid peroxidation. Glutathione depletion via cystine deficiency or inhibition of xCT or GPX4 accumulates cellular lipid peroxidation and ferrous iron, resulting in ferroptosis. Glutamine is an amino acid essential for growth of cancer cells as well as induction of ferroptotic cell death via the production of alpha-ketoglutarate ( $\alpha$ KG) from glutaminolysis. However, it is still unclear whether  $\alpha$ KG or its relevant metabolic process is engaged in ferroptotic cell death. **방법:** The effects of cystine deprivation and sulfasalazine were tested in HNC cell lines. The effects of cystine deprivation and sulfasalazine as well as the silencing and overexpression of DLD gene were by cell death, lipid reactive oxygen species (ROS) production, mitochondrial iron and membrane potential, mRNA/protein expression,  $\alpha$ -ketoglutarate dehydrogenase (KGDH)/succinate/aconitase assays, and mouse tumor xenograft models. Cystine deprivation induced ferroptosis via glutaminolysis. **결과:** Cystine-deficient conditioned medium or xCT inhibition with sulfasalazine induced typical ferroptotic cell death, which was prevented by the inhibition of glutaminolysis or  $\alpha$ KG production. Next, we focused the dihydrolipoyl dehydrogenase (DLD) and dihydrolipoyl succinyltransferase (DLST), consisting of the E3 and E2 components of  $\alpha$ KGDH respectively. Ferroptosis was significantly prevented by genetic inhibition of the DLD but not the DLST, which was rescued by re-insertion of the DLD gene. Cellular reactive oxygen, lipid peroxidation, and ferrous iron accumulation were induced by the increased function of  $\alpha$ KGDH, that is mainly the DLD, when  $\alpha$ KG was converted to succinate in the tricarboxylic acid cycle. Sulfasalazine did not significantly suppress the in vivo growth of the shDLD-transfected HNC cells but vector control transplanted in nude mice. **결론:** Taken together, our data support that the DLD is a key molecule inducing ferroptosis in cancer cells.

### EFFECT OF NOREPINEPHRINE AND B-BLOCKER IN HEAD AND NECK CANCER, IN VITRO STUDY

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MIN-SU KIM<sup>1</sup>, HYUN-AH SHIN<sup>1</sup>, NARAE JUNG<sup>1</sup>, SO-YOON LEE<sup>1</sup>, KYOUNG HO OH<sup>2</sup>, SOON YOUNG KWON<sup>2</sup>

**목적:** Some studies have shown that neurotransmitters are involved in the regulation of cancer cell invasion via  $B_2$ -adrenergic receptors. However, little is known regarding the effect of neurotransmitters on head and neck cancer cells. The aim of this study was to examine the regulative effect of norepinephrine, which belongs to the group of classical neurotransmitters, on the cell viability, proliferation, migration, and membrane invasion of head and neck cancer cells and the therapeutic effect of the  $B$ -blocker, propranolol, on them. **방법:** Total 7 head and neck cancer cell lines were selected for this study.  $B_2$ -adrenergic receptor expression was determined by RT-PCR and immunohistochemistry in head and neck cancer cell lines and specimens. Cell viability and proliferation assays were examined by use of  $\beta$ -adrenergic receptors agonists (norepinephrine) and antagonists (propranolol). The viability of head and neck cancer cells was examined using the EZ-Cytox assay. The proliferation of head and neck cancer cells was examined using the BrdU assay. The migration and membrane invasion of head and neck cancer cells was examined using the membrane invasion culture system assay. **결과:**  $B_2$ -adrenergic receptor was expressed on all head and neck cancer cell lines and specimens including oral, larynx, pharynx, and nasal cavity cancer. The

viability, proliferation, migration, and membrane invasion of all head and neck cancer cells pretreated with norepinephrine increased in a concentration-dependent manner. Propranolol reduced the viability, proliferation, migration, and membrane invasion of all head and neck cancer cells of norepinephrine-stimulated. **결론:** The cell viability, proliferation, migration, and membrane invasion of head and neck cancer is influenced by norepinephrine, which is one of the signal substances present in the tumor environment. This study may provide experimental evidence for the use of *B*-blocker in the chemoprevention of head and neck cancer proliferation.

## HNOP 4

기타 두경부 질환

10:30~11:30 • 세미나실5

Chairperson(s) : 김진환(한림의대), 이상혁(성균관의대)

**HNOP-19 10:30~10:40**

### MAKING UNIFORM SIZED BIOMIMETIC PSEUDOISLET WITH ENHANCED FUNCTION

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, CHEONAN, KOREA, <sup>2</sup>THE ROLF LUFT RESEARCH CENTER FOR DIABETES AND ENDOCRINOLOGY, KAROLINSKA INSTITUTET, STOCKHOLM, SWEDEN, <sup>3</sup>DEPARTMENT OF VETERINARY OBSTETRICS AND THERIOGENOLOGY, COLLEGE OF VETERINARY MEDICINE, KONKUK UNIVERSITY, SEOUL, KOREA, <sup>4</sup>DEPARTMENT OF BIOMEDICAL SCIENCE AND TECHNOLOGY, INSTITUTE OF BIOMEDICAL SCIENCE & TECHNOLOGY (IBST), KONKUK UNIVERSITY, SEOUL, KOREA, <sup>5</sup>DIABETES RESEARCH INSTITUTE, MILLER SCHOOL OF MEDICINE, UNIVERSITY

OF MIAMI, MIAMI, USA, <sup>6</sup>LEE KONG CHIAN SCHOOL OF MEDICINE, NANYANG TECHNOLOGICAL UNIVERSITY, IMPERIAL COLLEGE LONDON, NOVENA CAMPUS, SINGAPORE, SINGAPORE

JAE HONG PARK<sup>1</sup>, PIM P VAN KRIEKEN<sup>2</sup>, ANNA VOZNESENSKAYA<sup>2</sup>, ANDREA DICKER<sup>2</sup>, YAN XIONG<sup>2</sup>, JEONG IK LEE<sup>3,4</sup>, ERWIN ILEGEMS<sup>2,7\*</sup>, PER-OLOF BERGGREN<sup>2,5,6,7,2211</sup>

**목적:** The functional quality of insulin-secreting islets is a major factor determining the outcome of clinical transplantation for diabetes. It is therefore of importance to develop methodological strategies aiming at optimizing islet function prior to transplantation. The first purpose is to compare two different ways to produce organoids, by culturing dissociated islet cells in hanging drops, and in non-adherent round-bottom 96-well plates. The second purpose is to try to obtain a homogenous and standardized preparation of organoids. The third is to improve gene transfer efficiency **방법:** Pseudoislets were produced using hanging drops, and in non-adherent round-bottom 96-well plates and compare the size and function of both group by confocal laser scanning microscopy, SPEX in vitro and insulin secretion and morphological change were assessed in vivo. **결과:** Calcium response which represents the insulin secretion in both group showed similar pattern and the most effective size of pseudoislet was 150  $\mu$ m. And, GLUT-1 overexpressed pseudoislet showed better response than those with GLUT-2 overexpression. **결론:** Organoid's function can be more effectively modified by various way of tissue engineering in advance to transplantation to in vivo environment.

**HNOP-20 10:40~10:50**

### CLINICAL SIGNIFICANCE OF ACTINOMYCETES IDENTIFIED IN THE TONSIL SPECIMENS FROM

## ADULT PATIENTS UNDERGONE TONSILLECTOMY

DEPARTMENT OF OTORHINOLARYNGOLOGY, EULJI MEDICAL CENTER, EULJI UNIVERSITY SCHOOL OF MEDICINE

DONGHYUK JANG, MINSUK CHAI, YONGTAE CHO, HOCHAN KIM, JISUN KIM, MINSU KWON

**목적:** Actinomycetes is one of the resident flora in the oral cavity, and there have been reports with various conclusions of its association with the tonsil disease. The objective of this study is to identify the incidence of actinomycetes in tonsil of adult patients who undergone tonsillectomy and to find out the clinical significance from the presence of actinomycetes in tonsil. **방법:** Two-hundred seventy-nine adult patients who received tonsillectomy from 2013 to 2018 in our hospital were included in the analyses. The presence of actinomycetes in tonsil specimen was retrospectively investigated by a pathologist. The association between the presence of actinomycetes and perioperative clinical features (e.g., frequency of sore throat, obstructive symptoms, tonsil size, and postoperative courses, etc.) were analyzed. **결과:** Actinomycetes was found in tonsil specimens of 22 patients. (7.8%). There was no significant difference in the preoperative patients' complaints regarding the presence of actinomycetes. In the intraoperative findings, tonsillolith was more frequently identified in the patients with actinomycetes (5.4% vs. 22.7%,  $p=.011$ ). However, there was no impact of actinomycetes to the postoperative clinical courses including bleeding event, wound healing, or other complications. **결론:** The presence of actinomycetes in tonsillectomy specimens demonstrated a more frequent tonsillolith in our study subjects. However, we did not identify any other significant implication of actinomycetes to the clinical characteristics of adult patients undergone tonsillectomy.

HNOP-21 10:50~11:00

## CURRENT BURDEN OF HEAD AND NECK CANCER IN KOREA

DANKOOK UNIVERSITY HOSPITAL

SEUNG HOON WOO, PHIL-SANG CHUNG, SANG JOON LEE

**목적:** According to the definition for rare tumors by RARECARE (incidence  $< 6$  per 100,000), as well as according to the definition for rare diseases by the European Commission (prevalence  $< 50$  per 100,000) the H&N cancers described in this paper should be considered rare and diagnosis and treatment of these cancers should therefore be centralised. **방법:** The RARECARE project has proposed a different and more detailed grouping of cancers, based on localization and histological type, in order to identify rare entities with clinical meaning. We gathered data on cancer patients diagnosed from 1993 to 2016, all of which had vital status information available up to at least 1st January 2017. This study provides incidence, prevalence and survival rates for rare head and neck (H&N) cancers in Korea. **결과:** Among the rare H&N cancers, those of oral cavity had the highest annual crude incidence rate, followed by larynx cancer and oropharynx and salivary glands cancer. The prevalence for all investigated entities was lower than 3 per 100,000. The 5-year relative survival rates ranged from 30% for hypopharynx cancer to 74% for salivary gland cancer. **결론:** This project proposed a different and more detailed grouping of cancers based on localization and histological type in order to identify rare entities with clinical meaning

HNOP-22 11:00~11:10

## AIR POLLUTION IS ASSOCIATED WITH INCREASED RISK OF PERITONSILLAR ABSCESS FORMATION



## A NESTED CASE-CONTROL STUDY USING METEOROLOGICAL DATA AND NATIONAL SAMPLE COHORT DATA

HALLYM UNIVERSITY

HYO GEUN CHOI

**목적:** This study aimed to evaluate the association between meteorological conditions/air pollution and peritonsillar abscess formation. **방법:** The Korean Health Insurance Review and Assessment Service-National Sample Cohort (HIRA-NSC) data from 2002 through 2013 were used. A total of 3,891 participants with peritonsillar abscesses were matched (1:4) for age, sex, income, region of residence, hypertension, diabetes, and dyslipidemia with 15,276 control participants. The meteorological data included the mean daily temperature (°C), highest daily temperature (°C), lowest daily temperature (°C), daily temperature difference (°C), relative humidity (%), spot atmospheric pressure (hPa), SO<sub>2</sub> (ppm), NO<sub>2</sub> (ppm), O<sub>3</sub> (ppm), CO (ppm), and particulate matter less than 10 μg (PM<sub>10</sub>, μg/m<sup>3</sup>) for the previous 14 days, 10 days, 7 days, 5 days, or 3 days before the matched index date. These factors were measured in 94 or 273 locations hourly. The crude and adjusted odds ratios (aORs) and 95% confidence intervals (CIs) of meteorological data for peritonsillar abscess formation were analyzed using unconditional logistic regression analysis. Subgroup analyses were conducted according to age and sex. **결과:** The mean differences of NO<sub>2</sub>, and PM<sub>10</sub> concentrations for the 14 days between peritonsillar abscess group and control group were 1.78 ppb (95% CI = 1.47 to 2.09) and 1.33 (95% CI = 0.67 to 1.99), respectively. The aORs of NO<sub>2</sub> (0.1 ppm) and PM<sub>10</sub> (10 μg/m<sup>3</sup>) during the 14 days prior to the index date for peritonsillar abscess formation were 12.8 (95% CI = 8.4–19.5) and 1.04 (95% CI = 1.02–1.06), respectively. The other meteorological conditions did not reach statistical significance. **결론:** Peritonsillar abscess formation was associated with

high concentrations of NO<sub>2</sub> and PM<sub>10</sub>.

**HNOP-23 11:10~11:20**

## CORRELATION ANALYSIS BETWEEN HEAD AND NECK DISEASES AND PARTICULATE MATTER/CLIMATE USING BIG DATA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE

JAE WOO JOO

**목적:** To analyze the relationship between various head and neck diseases and particulate matter(PM<sub>2.5</sub>, PM<sub>10</sub>)/climate. **방법:** From January 2012 to December 2018, the number of patients who visited hospitals and clinics in Seoul was calculated using the data of the HEALTH INSURANCE REVIEW & ASSESSMENT SERVICE. The number of patients was confirmed by searching for Code K21 (Gastroesophageal reflux with or without oesophagitis), Code L021 (Cutaneous abscess of neck), Code J382 (Nodules of vocal cords), and Code K12 (Stomatitis). The average temperature, atmospheric pressure, average humidity, sunshine rate/sum, were collected from Seoul Meteorological Office. The average particular matter(PM<sub>2.5</sub>, PM<sub>10</sub>) were collected from Air Korea. The relationship was evaluated using Spearson correlation analysis. **결과:** The number of GERD/LPR patients had strong correlation with monthly average temperature, atmospheric pressure, shiny rate and PM 2.5. (p<0.001, p<0.001, p=0.007, p=0.024 respectively) The number of deep neck infection patients had strong correlation with monthly average temperature and atmospheric pressure.(p=0.001, p=0.007 respectively) The number of vocal nodule patients had significant correlation with monthly average atmospheric pressure, shiny sum, PM<sub>2.5</sub> and PM<sub>10</sub>. (p=0.002, p=0.001, p=0.023, p=0.035 respectively) The number of stomatitis pa-

tients had significant correlation with monthly average temperature, atmospheric pressure and shiny rate. ( $p < 0.001$ ,  $p < 0.001$ ,  $p = 0.002$  respectively) **결론:** Various head and neck diseases show different seasonal cycles. GERD / LPR patients increases in winter, decreases in summer; Deep neck infection, stomatitis increased in summer, decreased in winter; Vocal nodules increase in spring, decrease in summer / autumn / winter In particular, GERD / LPR is related to PM2.5, and vocal nodules are considered to be closely related to PM2.5 and PM10.

#### HNOP-24 11:20~11:30

### THE IMPACT OF TIME TO INITIATION OF POSTOPERATIVE RADIATION THERAPY ON RECURRENCE AND SURVIVAL IN HEAD AND NECK CANCER

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE, REPUBLIC OF KOREA

TAE HUN KIM, JAE WOO JOO, KYUNG HO OH, JAE GU CHO, SEUNG KUK BAEK, SOON YOUNG KWON, KWANG YOON JUNG, JEONG SOO WOO

**목적:** Advances in treatment of head and neck cancer(HNC) have led to increased complexity in treatment. Sophisticated radiation therapy(RT) planning improved survival, but also increased the delayed management. As a result, 2018 NCCN guideline recommended a preferred interval between surgery and postoperative RT(S-RT interval) within 6 weeks. We studies the impact of S-RT interval on recurrence and survival in patients who received RT after HNC surgery. **방법:** We retrospectively analyzed the medical records of patients diagnosed with HNC at a single tertiary hospital from 2010 to 2014. The patients who underwent surgery for HNC(Stage III, IV) and received postoperative RT were included. A total of 43 patients were included. Local recurrence rate(LRR),

Disease-specific survival(DSS), Disease-free survival(DFS), and Overall survival(OS) were identified. The correlation analysis were performed with S-RT interval. **결과:** Among 43 patients, all patients received RT within 14 weeks and the average duration of RT was 48.3 days. There was no statistically significant between the S-RT interval and LRR, DSS, DFS, and OS. However there seem to be a trend that the group with S-RT interval more than 6 weeks had a more recurrence than the group less than 6 weeks(OR = 1.259,  $p = .137$ ) **결론:** In this study, the recurrence and survival of HNC were not statistically significant with the S-RT interval. 5-year OS was 79%, which is relatively higher than other studies. This result suggests that advanced cancer patients may receive relatively different treatments instead of surgery and postoperative RT. So, patients with a relatively low risk of recurrence even with RT delay were selected and the impact of delayed RT would be reduced. Also, a recent study found that in salivary cancer, delayed RT was not related to the worse outcome. However, there is a limitation that this study included all types of HNC. Therefore, further studies will be required to determine whether there is a difference in survival for each HNC type.

**OTTPP I**

이과 I

10:30~12:30 • 세미나실6

Chairperson(s) : 조성일(조선의대), 문석균(중앙의대)

**OTTPP-01 10:30~10:34****THE ELECTROPHYSIOLOGICAL CHARACTERISTICS OF THE DRUG-SENSITIZED TINNITUS**<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY, EUL-JI MEDICAL CENTER, EULJI UNIVERSITY, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY BUN-DANG HOSPITALEUN BIT BAE<sup>1,2</sup>

**목적:** For tinnitus treatment, there was no proven drug but Clonazepam had been reported as a drug significantly affected to tinnitus. An anticonvulsant (CZP), a blood circulation enhancer, and an antidepressant commonly prescribed drugs for tinnitus in the clinic. For evaluating pathophysiological characteristics of CZP responders, we analyzed, retrospectively, hearing threshold and brain activity of CZP responders and non-responders. **방법:** Total twenty-four of drug taken tinnitus patients were selected from the approved study. Eleven subjects were no CZP taken, eight were non-responders taken CZP, and five were high responders taken CZP. We used pure-tone audiometry data for hearing and 32 electrodes of EEG data for measuring regional brain activity. Statistical analysis was done through Mann-Whitney U test. **결과:** Hearing thresholds were significantly increased in CZP responders than other non-responders ( $p < 0.05$  in 1kHz and 2kHz). There was no difference between non-responders taken CZP and not taken. Most of the whole brain area, power density was significantly

higher in the CZP responders, and percentage of beta3 and gamma band were significantly higher in the non-CZP responders. In source analysis, the activity of the alpha band in the auditory cortex was significantly lowered in the CZP responders than non-responders. But the non-responders were affected central area except auditory cortex. Also, the inhibitory function of the theta band in the occipital area, cingulate cortex, and parahippocampus were increased in the CZP responders than no CZP taken subjects. In the occipital and cingulate region, the ratio of gamma, beta3, delta, and theta was significantly decreased in the CZP responders than non-responders. **결론:** Tinnitus patients who sensitized to CZP had significantly increased hearing thresholds and higher power density in alpha than other non-responder groups. And the results support that the response of CZP in tinnitus is depending on the activity of the auditory cortex.

**OTTPP-02 10:34~10:38****MICRORNA EXPRESSION CHANGES IN COCHLEAR NUCLEUS AND INFERIOR COLLICULUS AFTER ACUTE NOISE-INDUCED HEARING LOSS**

SEOUL NATIONAL UNIVERSITY HOSPITAL

SOHYEON PARK, MYUNG-WHAN SUH, JUN HO LEE, SEUNG HA OH, MOO KYUN PARK

**목적:** Noise-induced hearing loss (NIHL) can lead to secondary changes that induce neural plasticity in the central auditory pathway. These changes include decreases in the number of synapses, degeneration of auditory nerve fibers, and reorganization of the cochlear nucleus (CN) and inferior colliculus (IC). This study investigated the role of miRNAs in the neural plasticity of the central auditory pathway after acute NIHL. **방법:** The 6 weeks old SD rats were divided into four groups. 1 Day and 3 Days control group ( $n=12$  each), 1 Day and 3 Days after noise exposure group ( $n=12$

each). The animals were exposed to white band noise (2–20kHz) at 115 dB for 2 hr. Auditory Brainstem Response (ABR) threshold, amplitude and latency were evaluated. Also a morphological evaluation of organ of corti and the whole mounting was executed for hair cell counting. Microarray analysis of the miRNAs in the CN and IC was performed using Affmetrix miRNA 4.0 GeneChip. RT-qPCR was carried out for a validation of candidate miRNAs. **결과:** At 3 days after the noise exposure, ABR threshold shift was significantly low in 3 Days group ( $p<0.001$ ). The amplitudes of Wave II were significantly larger in 3 Days group than 1 Day group ( $p<0.001$ ). Organ of corti on the basal turn were damaged and the number of surviving outer hair cells were significantly lower on basal and middle turn area in hearing loss groups than in control groups. Total 5 and 3 candidate miRNAs for each CN and IC were selected from microarray analysis and the RT-qPCR. A pathway analysis using the Kyoto Encyclopedia of Genes and Genomes (KEGG) database suggested that the miRNAs may be associated with the mitogen-activated protein kinase (MAPK) signaling pathway. **결론:** The data confirms that even short-term acoustic stimulation can lead to changes in neuroplasticity. Further studies are needed to validate the candidate miRNAs. Such miRNAs may be used in the early diagnosis and treatment of neural plasticity of the central auditory pathway after acute NIHL.

**OTTPP-03 10:38~10:42**
**DEVELOPING KOREAN NATIONAL REFERENCE STANDARDS PROTOCOLS FOR HEARING DATA**

YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE

JI HYEUN LEE, YOUNG JOON SEO

**목적:** 우리나라 국가표준기본법에서는 국가표준을 측정표준, 참조표준, 성문표준으로 분류하고 있으며, 현

재 한국인 청각에 대한 표준이 없는 상태임. 이에 한국인 청각참조표준데이터 센터에서는 순음청력검사에 대한 표준 절차를 마련하고, 많은 기관들이 이를 따를 수 있게 교육하기 위함. **방법:** - 한국인 연령별/성별 청각 참조데이터 수집 및 생산 - 한국인 소음성 난청 연령별/성별 청각 참조데이터 수집 및 생산 - 한국인 청각 참조데이터 평가를 통한 참조데이터 자체 등급부여 - 한국인 청각 참조데이터 등급부여 요청 및 참조표준 등록 요청 - 국제공동연구를 통한 청각 데이터 생산 및 대규모 연구 **결과:** (1) 순음청력검사의 기도검사의 표준인증 (가) 국제 기준인 ISO와 KS를 기반으로 기도 순음청력검사 방법을 인증 (2) 검사 방법 및 기기/검사시설의 표준화 작업 (가) 청각데이터센터에서 수집할 데이터와 관련된 청각 검사 방법을 ISO 및 KS 기준을 기반으로 절차서 표준화 (나) 검사기기 표준화: 중이검사 기기의 주파수 및 강도 출력, 공기펌프/순음청력검사 기기의 헤드폰 및 골전도체 보정/청성뇌간검사 임피던스 보정 (다) 검사시설 표준화: 검사부스, 온도, 습도 표준화 **결론:** 한국인 청각참조표준데이터에 대한 절차를 마련하고, 수집 및 분석을 통틀어 한국인의 고유의 청각 데이터를 표준화하기 위함.

**OTTPP-04 10:42~10:46**
**METABOLIC SYNDROME IS ASSOCIATED WITH HEARING DISTURBANCE**

DEPARTMENT OF OTOLARYNGOLOGY, ENT, KYUNG HEE UNIVERSITY, SEOUL, REPUBLIC OF KOREA

HEE-JIN KANG, MYUNG-JIN PARK, JAE-YONG BYUN, MOON-SEO PARK, SANG-HOON KIM, SEUNG-GEUN YEO

**목적:** This cross-sectional review of health examination center data sought to determine the association between metabolic syndrome and hearing disturbance. **방법:** This study involved 28,866 subjects. Height, weight, waist circumference, and blood pressure were measured, and basic blood tests and pure-tone audiometry (PTA) were performed. Other factors

analyzed included body mass index, hypertension, diabetes mellitus, and hyperlipidemia. **결과:** Age and gender did not differ between subjects with and without metabolic syndrome. PTA was slightly higher in subjects with than without metabolic syndrome, but the difference was not statistically significant ( $p=0.47$ ). The incidence of hearing loss was no higher in subjects who met three of the five diagnostic criteria of metabolic syndrome than in those who met 0-2 criteria, but was significantly higher in subjects who met four ( $p=0.04$ ) and five ( $p<.01$ ) criteria. **결론:** Metabolic syndrome may be associated with hearing loss, especially in subjects who meet four or five of the diagnostic criteria for metabolic syndrome.

**OTTPP-05 10:46~10:50**
**NEURAL CORRELATES OF MCGURK EFFECT IN MUSICIANS**

<sup>1</sup>LABORATORY OF BRAIN & COGNITIVE SCIENCES FOR CONVERGENCE MEDICINE, HALLYM UNIVERSITY COLLEGE OF MEDICINE, SOUTH KOREA, <sup>2</sup>DEPARTMENT OF OTOLARYNGOLOGY, HALLYM UNIVERSITY COLLEGE OF MEDICINE, SOUTH KOREA

JIHYUN LEE<sup>1</sup>, JI-HYE HAN<sup>1</sup>, HYU-JEONG LEE<sup>1,2</sup>

**목적:** The McGurk effect is a cross-modal illusion occurring when an auditory stimulus is presented with a different visual stimulus. The illusive perception, however, is not perceived for everyone and the different perception is related to learning experiences such as music. Behavioral studies have shown that musicians have weaker McGurk illusion compared to nonmusicians. Here, we measured cortical alpha oscillations to congruent/incongruent audiovisual CV syllables in musicians. **방법:** Seven professional musicians (all right handed, mean age=23) participated. Visual and acoustic stimuli were eight CV syllables including /ba/, /da/, /ga/, /ka/, /ma/, /na/, /pa/ and /

ta/). For McGurk illusion, we created 8 auditory-only (A-only), 8 visual-only (V-only), 8 audiovisual congruent (AV-congruent), and 12 audiovisual incongruent (AV-incongruent) conditions. Cortical alpha oscillation was analyzed during the onset of voicing for each condition. Behavioral measures included detection and reaction time for the AV congruent/incongruent conditions. **결과:** Behavioral results revealed that musicians incurred weak fusion illusion for AV incongruent condition. Electrophysiology data showed that alpha event-related synchronization (ERS) was observed in 4 musicians whose fusion illusion was weak for the AV incongruent condition. Additionally, strong alpha event-related desynchronization (ERD) revealed for the A-only condition during an entire stimulus range, while the alpha ERD decreased for AV congruent condition. **결론:** Our results indicate that McGurk illusion can be reflected in cortical alpha activities in musicians. Increased alpha ERS in low fusion perceivers would be related to a characteristic of alpha activity, which is closely related to auditory selective attention for speech perception during a compelling listening condition such as AV incongruent stimulus.

**OTTPP-06 10:50~10:54**
**CAN THE DIRECTION OF HEARING LOSS AFFECT THE IDENTIFICATION OF SOUND DIRECTION IN PATIENTS WITH UNILATERAL HEARING AID**

DEPARTMENT OF OTOLARYNGOLOGY, AJOU UNIVERSITY SCHOOL OF MEDICINE

JUNG-HO HA, HAN-TAI KIM, HUN-YI PARK

**목적:** Identification of sound direction is determined by several factors, including interaural time and level differences between two ears. Patients with unilateral hearing loss have difficulty in identifying the direction of sound. Previous studies have shown that the

**Withdrawal**

use of hearing aids (HAs) in hearing loss can help an improvement in directional perception of sound. In spatial orientation, the right hemisphere is known as the dominant hemisphere. In this study, we analyzed the results of the sound localization test to reveal that discordance of the results between right and left ear in patients using a unilateral HA. **방법:** Patients with unilateral hearing loss who had performed sound localization tests since 2018 were included in this study. All patients underwent sound localization tests, functional gain test with a hearing aid, and speech audiometry. The tests were followed up for 6 months after the use of HA. **결과:** Of the 48 patients, right hearing loss was 20 and left hearing loss was 28. Before wearing the hearing aid, there were no significant differences in the aided SDS and sound localization tests according to the left and right ears. In the test performed within 1 month after wearing the hearing aid, aided SDS was elevated in both sides, but there was no difference in the sound localization test. Six months later, the patients with right hearing loss scored significantly higher on the aided PCT (60.6 in right and 39.7 in left,  $P=0.036$ ) and MAE(27.1 in right and 47.0 in left,  $P=0.032$ ). **결론:** After use of hearing aids, aided SDS results seem to improve on both sides. However, according to the left and right ear, the results of sound localization showed higher scores on the right side after 6 months after wearing. It could be that the right dominant hemisphere in spatial orientation has affected this result. In addition, it is necessary to pay attention to the interpretation of the sound localization test results between left and right unilateral hearing loss patients.

OTTPP-07 10:54~10:58

#### SOUND LOCALIZATION FUNCTION IN PATIENTS WITH BILATERAL HEARING IMPAIRMENT USING HEARING AIDS AND/OR COCHLEAR IMPLANT

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**목적:** 보청기 혹은 인공와우를 착용하는 양측 난청환자를 대상으로 방향성 검사 결과를 분석하였다. **방법:** 2019년 3월부터 8월까지 총 32명의 청력손실 환자를 대상으로 방향성검사를 실시하였으며, 양측 CI 착용(9명), 편측 CI 착용(7명), CI와 HA 착용(2명), 양측 HA 착용(4명), BiCROS환자군(2명)에 대해 결과를 분석하였다. 남성 11명, 여성 13명이었고 연령은 7세부터 68세까지 다양하였다. 평균 청력 (unaided PTA)은 CI 대상기는 118.9dB(72.5dB~deaf), HA 대상기는 77.7dB(36.3dB~deaf)이었다. 방향성 검사는 30도 간격으로 전방 -90~+90도에 배치된 7개의 스피커를 통해 자극음을 제시하였으며, 피검자로부터 소리가 들린 쪽의 스피커 번호를 응답하도록 하여, 각각 정반응률(hit rate)과 오류각(error degree)을 구하는 방식으로 진행하였다. 정반응률은 높을수록 좋고, error degree는 낮을수록 좋은 반응으로 해석한다. 500Hz와 4kHz에서 narrow-band-noise의 소리를 65 dB과 90 dB의 강도로 각각 제시하였다. **결과:** 양측 CI군에서의 Hit rate는 500Hz 65dB에서 28.6%(SD19.9), 4kHz 65dB에서 34.1%(22.5), 4kHz 90dB에서 24.6%(24.5)였으며, Error degree는 각각 40.0도(18.5), 36.4도(20.6), 56.4도(22.5)였다. 편측 CI군에서 Hit rate는 각각 20.4%(21.6), 22.5%(22.4), 15.3%(8.7), Error degree는 58.2도(23.6), 63.5도(24.1), 68.9도(13.5)로 양측 CI보다 모두 좋지 않은 결과를 보였다. CI와 HA를 착용하는 군에서도 Hit rate는 17.9%(15.2), 14.3%(10.0), 14.3% (10.1)로 CI편측군보다 낮았으며, Error degree도 46.1도(1.5), 79.3도 (15.2), 62.1도(3.0)로 양측 CI보다 크게 나타났다. 양측 HA군에서 Hit rate는 35.7%(44.0), 19.6%(30.5), 28.6%(38.2), Error degree는 각각 38.0도(30.4), 42.9도(42.4), 47.4도(33.5)로 CI편측과 bimodal착용자에 비해 모두 좋은 결과를 보였다. BiCROS군은 Hit rate 14.3%(10.1), 10.7%(5.1),

10.7%(5.1), Error degree 각각 86.8도(22.7), 85.7도(6.1), 83.6도(9.1)로 모든 군에서 모든 결과에 가장 저조한 결과를 보였다. **결론:** 500Hz/65dB검사의 Hit rate를 제외한 모든 결과에서 양측 CI착용군이 가장 좋은 결과를 보였으며, BiCROS착용군에서 모든 결과가 가장 나쁘게 나타났다. 전반적으로 양이 동일한 기기를 착용한 경우가 편측 착용 혹은 HA/CI착용보다 sound localization 기능이 좋은 것으로 분석된다.

OTTPP-08 10:58~11:02

### DEVIANT AUDITORY PROCESSING ASSOCIATED WITH ACUTE IDIOPATHIC TINNITUS WITH NORMAL HEARING

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**목적:** To assess potential changes in auditory processing by analyzing auditory brainstem response (ABR) and distortion product otoacoustic emissions (DPOAE) in patients with acute-onset idiopathic tinnitus with normal hearing level (ATNHL) **방법:** A total of 62 patients (M:F=33:29, aged 41.3±12.2) with ATNHL (< 8 weeks, ≤ 20dB bilaterally and ≤ 10dB asymmetry) were included (tinnitus group, TG). Age-matched control groups (CG) (31 cases, M:F=17:14, aged 40.6±13.5) were recruited. Various parameters from ABR (90dB click-evoked stimulation) and DPOAE (0.5–8kHz, 65/55dB stimulation) were analyzed according to the laterality of tinnitus, age, and gender. **결과:** Pure tone thresholds were not different between groups (11.0±5.43 for TG, 10.15±4.11 for CG). Significantly small wave I amplitude was recorded for TG (0.22±0.09μV) than CG (0.37±0.14μV) (p=0.007) although wave V amplitudes were not different (0.37±0.14μV versus 0.39±0.16μV, p=0.362).

The same results were confirmed for unilateral TG (n=39) (0.23±0.10μV versus 0.31±0.14μV, for wave I amplitude, p=0.046), whereas bilateral TG (n=23) failed to show differences (p=0.085). The wave I amplitude for TG was significantly small than that of CG for ≥50 year-old group (p<0.001), or female participants (p=0.007) whereas, they were not different for <50 year-old group (p=0.414) or male participants (p=0.892). The wave V amplitude, the latency of wave I, III, and V were not different between groups for every combination of analyses. Significantly more cases with decreased high frequency DPOAE response (6–8 Hz) were included for groups with small wave I amplitudes (<0.24, mean value) (p=0.047, Chi-squared test). **결론:** Significantly small wave I amplitude of ABR was confirmed for patients with ATNHL with significantly decreased response of DPOAE suggesting potential abnormal auditory processing such as cochlear synaptopathy. However, it was not observed for younger patients (<50 years) suggesting potential contribution of age-related degeneration.

OTTPP-09 11:02~11:06

### AUDIOLOGIC OUTCOME AND COMPLICATIONS OF MEI IN ELDERLY

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**목적:** To evaluate audiologic result and postoperative complications of the middle ear implantation in elderly. **방법:** This was a retrospective review of audiological data and medical chart analysis of 34 patients provided with middle ear implantation in Veterans Health Service Medical Center between June 2013 and April 2017. Audiometric testing was performed before surgery, and postoperative aided audiometric testing was

taken to evaluate the functional hearing gain at 1 year after surgery. Patients who underwent explantation were divided into two groups depending on whether they have poor hearing benefit. **결과:** The total follow-up period ranged from less than 1 year to 5.3 years. Functional gain with MEI was significantly improved compared with preoperative AC thresholds at middle frequencies (1kHz,  $14.3 \pm 13.8$ ; 2kHz,  $19.1 \pm 13.8$  dB). Most common complaint of MEI patients was poor hearing benefit. Of the 34 patients, 8 patients underwent explantation and 7 patients lost their external audio processor. **결론:** In the elderly patients, the MEI can be considered as auditory rehabilitation which provided improvement of speech recognitions and significant functional gain. Also, it is necessary to explain appropriate expectation before MEI and to counsel about MRI-compatible models because of the high possibility of MRI being performed in the near future.

## OTTPP-10 11:06~11:10

### HEPARIN THERAPY AS ADJUVANT TREATMENT FOR PROFOUND IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS

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**목적:** This study aims to provide evidence whether unfractionated heparin used as adjuvant therapy in conjunction with systemic corticosteroid therapy improves hearing recovery in patients with profound idiopathic sudden sensorineural hearing loss (ISSNHL), and to compare the effect of this treatment with those of additional intratympanic corticosteroid therapy. **방법:** Eighty-seven patients with profound ISSNHL ( $\geq 90$  dB) and who had been admitted at a tertiary refer-

ral center between 2010 and 2018 were retrospectively reviewed: 67 patients for additional intratympanic corticosteroid injection (ITSI group) and 21 for adjuvant heparin therapy (heparin group). Hearing recovery was evaluated by grade assessment according to the American Academy of Otolaryngology-Head and Neck Surgery criteria. **결과:** 42.8 % of the patients in the heparin group recovered serviceable hearing, which was significantly higher than the recovery rates (19.7%) of those in the ITSI group. Particularly, in patients with pretreatment hearing level of 90–100 dB, adjuvant heparin therapy enhanced therapeutic effects with a significant hearing recovery rate of 80%. However, in patients with initial hearing level  $>100$  dB, the rates of significant hearing recovery in the two groups were roughly equal and remained to be unsatisfactory (8.1% in the ITSI group and 9.1% in the heparin group). **결론:** The results of this study suggest that the treatment of profound ISSNHL with adjuvant heparin therapy in combination with systemic steroid therapy results in higher hearing recovery rates, when compared to combined local and systemic corticosteroid therapy, without serious complications.

## OTTPP-11 11:10~11:14

### A RETROSPECTIVE REVIEW OF TEMPORAL BONE CT TO PRESENT SAFE GUIDELINE FOR BONE-ANCHORED HEARING AIDS

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**목적:** Bone-anchored hearing device (BAHD) is con-



traindicated in patients younger than five years because calvarial bone isn't thick enough at the implant site. However, it has not been studied in the Korean population. This study was not only to establish a safe guideline for depth of implant device in all age groups who undergo BAHD implant surgery, but also to investigate whether implantation of currently used BAHDs could be done safely in Korean children, especially those younger than five. **방법:** Two hundred eighty patients, who underwent high-resolution temporal bone computed tomography (TBCT) images between August 2010 and October 2018 were randomly enrolled in all ages. We retrospectively reviewed TBCT imaging to measure skull bone thickness at the recommended BAHD implant site. **결과:** The average skull bone thickness was 2.87 mm in patients younger than five years and 6.72 mm in patients older than five years, respectively, which conforms to the current guideline. The results indicate nearly 50% of calvarial bone thicknesses were less than 3 mm in patients under five years old, while 92.78% of the patients older than five years of age showed bone thickness greater than 4 mm. Of note, calvarial bone thickness was thicker than 3 mm in all patients who are older than 6 years. **결론:** This study confirms that the currently approved BAHD implantation guideline is suitable in the Korean population. For safety, we suggest taking TBCTs prior to surgery, especially in pediatric patients. Besides, Non-invasive applications are recommended for patients younger than five.

OTTPP-12 11:14~11:18

## USE AND REPLACEMENT OF SPEECH PROCESSOR IN COCHLEAR IMPLANT USER

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**목적:** 인공와우 이식 연령층이 낮아지고 양측 인공와우 이식 수술이 늘어남에 따라 사용자들의 외부 어음처리 기 교체에 대한 부담도 증가하고 있다. 따라서 외부 어음처리기 사용 중 분실이나 고장 및 노후로 인한 어음처리기의 재구입 실태를 알아보고 개선 방안에 대해 논의하고자 하였다. **방법:** 1992년부터 현재까지 경북대학교 병원에서 인공와우 이식 수술을 받은 약 450명의 환자 중에서 최근 5년 동안 한 번 이상 내원하였고 인공와우 착용 기간이 1년 이상 된 인공와우 사용자를 대상으로 어음처리기 교체와 관련된 내용을 조사하였다. 인공와우 사용자들의 외부 어음처리기 교체 및 재구입 전 사용 기간과 교체 및 재구입 시기, 횟수, 이유, 보험 적용 여부에 대해 의무기록 분석과 설문 조사를 통해 알아 보았다. **결과:** 대부분의 인공와우 사용자들은 5년 이상 어음처리기를 사용하였고 10년 전후로 재구입하였다. 가장 길게 사용한 기간은 23년이었고, 가장 짧게 사용한 기간은 5년이였다. 재구입 이유로는 부속품 판매 및 수리 서비스 종료, 수리 불가능한 고장, 분실, 새로운 제품 출시로 인한 교체 등이었다. 또한 재구입 시 사용자의 80% 이상이 보험 적용을 받아서 구입한 것으로 나타났다. **결론:** 인공와우 외부 어음처리기는 다양한 이유로 비교적 짧은 기간에 교체 또는 재구입이 이루어지고 있다. 인공와우 이식 연령층이 낮아지고 양이 인공와우 사용자가 늘고 있지만 외부 어음처리기 교체와 관련된 지원이나 문제점에 대한 개선은 이루어지고 있지 않다. 따라서 무분별한 교체는 방지하고 교체에 대한 부담은 줄일 수 있는 방안을 모색해야 할 시점이다.

OTTPP-13 11:18~11:22

## CHARACTERISTICS OF NASALANCE SCORES IN CHILDREN WITH COCHLEAR IMPLANTS

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**목적:** 청각장애 아동은 기질적인 연인두 개폐의 문제가 없음에도 청각적 피드백의 부족으로 과대비성을 보이는 것으로 알려져 있다. 이에 본 연구에서는 인공와우 이식을 받은 아동을 대상으로 다양한 구강음 수준에서 비음치를 측정하여 인공와우 이식 아동의 비음 특성을 알아보고자 하였다. **방법:** 2019년 7월부터 내원한 4세 이전에 편측 인공와우 이식 수술을 받고 10년 이상 인공와우를 착용한 학령기 아동 20명을 대상으로 CV음절(/pa/, /pi/, /pu/), 단어(/paduk/, /hodo/, /sagwa/), 문장('Rabbit' 문단)을 따라 말하고, Nasometer를 이용하여 비음치를 측정하였다. 따라 말하기를 2회 실시하고, 각 수준에서 평균값을 내어 비음치를 산출하였다. 이를 인공와우 이식시기, 인공와우 착용기간, 성별에 따른 차이가 있는지 분석하였다. **결과:** 인공와우 이식 아동의 비음치는 정상에 비하여 높게 나타났다. 평균 비음치는 제시된 자료의 수준에 따라서 CV음절 > 문장 > 단어 순으로, CV음절 내에서는 /pi/ > /pa/ > /pu/ 순으로 높은 것으로 나타났다. 또한, 성별에 따라서는 유의한 차이가 있었으며, 인공와우 이식시기와 착용기간에 따라서는 유의한 차이를 보이지 않았다. **결론:** 인공와우 이식 아동은 이식시기와 착용기간에 상관없이 공명 조절에 어려움이 있는 것으로 나타났다. 이 연구 결과는 인공와우 이식 후 청력의 개선이 이루어지더라도 적절한 평가와 지속적인 공명 조절에 대한 언어훈련의 필요성이 필요함을 제시한다.

OTTPP-14 11:22~11:26

# COMPARISON OF THE TREATMENT OUTCOME BETWEEN PRIMARY ITS AND SALVAGE ITS PROTOCOL IN SUDDEN SENSORINEURAL HEARING LOSS: PROPENSITY SCORE MATCHING ANALYSIS

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**목적:** We aimed to compare the treatment outcomes between primary intratympanic steroid (ITS) and ITS as a salvage treatment. **방법:** From January 2016 to December 2019, four hundred forty patients with unilateral idiopathic sudden sensorineural hearing loss(ISSNHL) were assessed. Among them, 37 patients received ITS as a primary treatment, while the other patients received systemic steroid, and 276 of them received ITS as a salvage treatment protocol. We performed 1:2 propensity score matching using parameters of initial hearing level, presence of vertigo, onset of treatment, age, sex, hypertension and diabetes with ITS patients and patients managed with salvage ITS protocol. The hearing recovery between the ITS group and propensity score matched control group was compared according to the AAO-HNS guideline and Siegel's criteria. **결과:** Overall 440 ISSNHL patients, 28.9% received systemic steroid only and 62.6% of patients managed with systemic steroid plus salvage ITS. Thirty-seven patients (8.4%) were managed with ITS only. 36.8% of patients were complete recovered and 35.0% did not recovered their hearing according to AAO-HNS guideline. After propensity score matching, initial hearing level, age and onset of treatment were not significantly different between ITS and control group. Regarding treatment outcome, complete recovery rate in ITS and control group were 29.7% and 33.8%, respectively. Although the recovery rate of the systemic steroid group was higher than that of the ITS group, statistical significance was not identified. **결론:** Treatment strategy of primary ITS and salvage ITS protocol did not significantly affect the clinical outcomes of idiopathic sudden sensorineural hearing loss.

OTTPP-15 11:26~11:30

### A GENETIC STUDY FOR SENSORINEURAL TINNITUS BASED ON GENOME-WIDE ASSOCIATION & ENDOPHENOTYPE STUDY: DEVELOPMENT OF GENETIC DIAGNOSTIC KIT FOR PRECISION MEDICINE

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**목적:** Tinnitus is the perception of sound that does not occur from external sources which interferes with daily life by causing insomnia, loss of concentration, and depression. Despite its high prevalence, the genetic research of the chronic primary tinnitus is still in its early stages. This study was performed to find genetic variation in patients with chronic sensorineural tinnitus using the genome-wide association study (GWAS) analysis method. **방법:** Among those who complained of subjective or objective tinnitus, patients diagnosed with chronic sensorineural tinnitus by an expert were registered in the experimental group. We genotyped blood of 200 cases of tinnitus patients and 200 controls with Korean Biobank Array, which was optimized for the Korean population. **결과:** Out of more than 800,000 single nucleotide polymorphisms (SNP), 4 loci (rs1924089, rs1039239, rs11064191, and rs9682978) were identified as significantly associated with tinnitus ( $P < 10^{-5}$ ). Three of them were located in intergenic regions; one was located in intronic region of a coding gene, SORBS2. **결론:** We could not find any previous reports of the four SNPs we discovered with respect to tinnitus. Subsequent functional valida-

tion would be needed.

OTTPP-16 11:30~11:34

### HEARING LOSS WITH CONGENITAL CYTOMEGALOVIRUS INFECTION IN KOREA

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SEUNG HO SHIN

**목적:** In this study, we determined the prevalence of hearing loss in 39 children with proven congenital cytomegalovirus (cCMV) infection. We looked at possible risk determinants for developing hearing loss and proposed recommendations for screening and follow-up in the newborn. **방법:** In a prospective 10-year study, 39 children with proven cCMV infection were evaluated for sensorineural hearing loss (SNHL). cCMV was confirmed by detection of CMV-DNA in urine <3 weeks of age. **결과:** Overall, 39(1.6%) neonates were identified with cCMV. The incidence of SNHL in children with cCMV infection was 20.5%(8/39). Hearing loss was more common in the case of high titration of CMV Quantitative PCR and in the presence of abnormalities on a neonatal brain. **결론:** SNHL is a common sequela in children with cCMV infection. Risk factors for SNHL were high titration of CMV Quantitative PCR and associated brain complications. These children may benefit from a more thorough investigation for SNHL than children who do not present with those risk factors.

OTTPP-17 11:34~11:38

### ENDOSCOPIC VERSUS MICROSCOPIC BUTTERFLY INLAY CARTILAGE MYRINGOPLASTY

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DINA HASHIM<sup>1,2</sup>, SE A LEE<sup>2</sup>, IN SEOK MOON<sup>2</sup>

**목적:** Butterfly inlay cartilage myringoplasty makes the graft easy, reduces operation time, and needs minimal postoperative care. Nowadays, endoscopic myringoplasty is becoming increasingly popular, but data are quite current but not yet sufficient. We investigate the outcomes and educational advantages of microscopic versus endoscopic inlay butterfly cartilage myringoplasty (BICM). **방법:** This study included 101 patients who underwent BCIM from January 2011 to December 2018. Patients were divided into 2 groups: patients who underwent endoscopic BCIM (Group I, n = 31) and patients who underwent conventional microscopic BCIM (Group II, n = 70). Anatomic success was defined as an intact, repaired tympanic membrane, and functional success was defined as a significant decrease in the air-bone gap at the end of follow-up. Perioperative pain was analyzed using a visual analogue scale (VAS). Educational advantage was surveyed from assistants using questionnaire. Surgical success, functional success, perioperative pain, operating time, and educational advantage were evaluated and compared. **결과:** The surgical success rate was 95.6% in Group I and 96.4% in Group II ( $p = 0.536$ ). The mean air-bone gap decrease ( $8.1 \pm 2.8$  dB vs.  $7.8 \pm 2.2$  dB, respectively) ( $p = 0.412$ ), A VAS score for pain ( $1.5 \pm 1.2$  vs.  $1.9 \pm 1.7$ , respectively), and operation time ( $25.6 \pm 8.5$  min vs.  $30.6 \pm 10.5$  min, respectively) ( $p = 0.381$ ) showed no differences between two groups. The educational excellence is better in endoscopic BICM than microscopic BICM. **결론:** Endoscopic BICM appears to be an effective alternative to microscopic BCIM in most aspects of results and also helps in teaching and learning the technique of BICM.

OTTPP-18 11:38~11:42

## EAR-MOLD FOREIGN BODIES IN THE MIDDLE EAR NECESSITATING SURGICAL REMOVAL: THE REASON WHY HEARING AID CANDIDATES SHOULD BE SCREENED BY EAR SPECIALISTS

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SUNG-DONG CHO<sup>1\*</sup>, JEONG HUN JANG<sup>2\*</sup>, HAN TAI KIM<sup>2</sup>, YANG-SUN CHO<sup>3</sup>, YOONJOONG KIM<sup>1</sup>, JAWON KOO<sup>1</sup>, JAE-JIN SONG<sup>1</sup>

**목적:** Fitting hearing aids (HAs) usually requires the creation of an ear mold that assists the device to be fixed in the ear canal and contributes to the reduction of feedback. Although the impression molding process is safe in general, it can cause serious complications when the impression mixture is accidentally located in the middle ear (ME). We present 4 patients who suffered from mold-constituent foreign body (FB) of the ME that necessitated surgical removal, with a review of the literature. **방법:** We retrospectively analyzed 4 patients who presented with severe complications due to improper earmold fitting that required immediate surgical intervention at 3 different tertiary referral centers from October 2012 to April 2019. From the medical records, we gathered information on pre- and postoperative status including otoendoscopic findings, audiometry results, and radiologic findings. Also, surgical approaches and intraoperative findings were analyzed using operation records and video clips. **결과:** All 4 patients had a previous history of chronic otitis media (COM) with tympanic membrane perforation and underwent impression molding without an examination by an otology specialist. Three pa-

tients presented with ipsilesional profound hearing loss while the other 1 with moderate hearing loss. Three underwent FB removal via the transmastoid approach while the other 1 via the transcanal approach. Although the FB filling the ME was safely removed and tympanoplasty was performed without any major complications, postoperative audiologic outcomes were not desirable. **결론:** HAs candidates should always be evaluated by an otologist prior to impression molding. In particular, subjects with external- or ME problems should be evaluated meticulously to prevent catastrophic ear mold-related complications. Because complete FB removal and tympanoplasty cannot guarantee sufficient hearing restoration, a thorough evaluation by an otologist as well as careful impression molding by an audiologist are mandatory.

within 3 months were compared between two groups.

**결과:** There was no significant difference of sex, age, affected side ratio, size and duration of perforation, healing confirmation time, and hearing test results between two groups. There were failures of recovery of 3 cases in paper patch group and 1 in ADAP group, respectively. ADAP showed higher recovery rate of perforation with no statistical significance. However, patching duration of ADAP was statistically longer than paper patch group ( $p=0.006$ ). **결론:** Given that, ADAP may be a good alternative material for treatment of traumatic TM perforation compared to paper patch. Particularly, ADAP should be considered in aspect of the safety of medical materials.

#### OTTPP-19 11:42~11:46

### EFFECT OF ACELLULAR DERMAL ALLOGRAFT PATCH FOR TREATMENT OF TRAUMATIC TYMPANIC MEMBRANE PERFORATION

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY, COLLEGE OF MEDICINE, BORAMAE MEDICAL CENTER

DONG-HAN LEE, YOUNG HO KIM

**목적:** Although traumatic perforation of tympanic membrane (TM) has a tendency of spontaneous healing, special consideration may be required to avoid surgical intervention for non-healed TM. The aim of this study was to compare outcomes of local anesthetic procedures using paper and acellular dermal allograft patch (ADAP) in traumatic TM perforation. **방법:** From 2013 Apr. to 2019 Jun., medical records with traumatic TM perforation were investigated retrospectively. Of 36 cases, 16 underwent paper patch procedures and 20 ADAP. Perforation size, patching duration, healing confirmation, and failure of healing

#### OTTPP-20 11:46~11:50

### COMPARISON OF MICROSCOPIC AND ENDOSCOPIC SIMPLE UNDERLAY MYRINGOPLASTY

DEPARTMENT OF OTORHINOLARYNGOLOGYHEAD AND NECK SURGERY, ULSAN UNIVERSITY HOSPITAL, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, ULSAN

TAE KOON KIM, JIN IL KIM, TAE-UK CHEON, BYUNG CHUL KANG, JOONG KEUN KWON

**목적:** Simple Underlay Myringoplasty (SUM) is a minimally invasive technique that can be applied to patients with chronic otitis media without mastoid inflammation. SUM has some advantages including short operation time, local anesthesia, and easy to postoperative care. The aim of this study was to compare the results of SUM between conventional microscopic surgery and endoscopic approach. **방법:** We collected data of patients who underwent SUM at Ulsan University Hospital for 10 years from 2009 to 2019. Surgical approach, time of operation, graft success rate, and hearing outcomes were analyzed. The patients were classified into two groups: microscopic SUM (MSUM) and endoscopic SUM (ESUM). **결과:**

A total 95 ears of 86 patients were enrolled, including 5 cases of bilateral surgery and 4 cases of reoperation in the same ear. The mean follow-up period was 9 months. 59 cases were MSUM group and 36 cases were ESUM group. The average operation time was 28 minutes in total SUM cases. There was no statistical difference in operation time according to surgical approach, 27 minutes for MSUM group and 31 minutes for ESUM group ( $p = 0.682$ ). The graft success rate was 81% (77/95) in entire cases. There was no statistical difference between two groups, MSUM group (85%, 50/59) and ESUM group (75%, 27/36), in graft success rate ( $p = 0.240$ ). The mean preoperative and postoperative air-bone gap (ABG) was 16.3dB and 10.0dB in all cases. The ABG was improved from 16.2dB to 10.0dB in MSUM group ( $p=0.000$ ), whereas in ESUM group, from 16.5dB to 10.8dB ( $p=0.016$ ). There was no case which bone conduction or ABG increased more than 10dB after surgery. **결론:** Simple underlay myringoplasty can be performed in short time under local anesthesia, and less burdensome to both patient and surgeon. This minimal invasive surgery may be good choice in treatment of chronic otitis media with appropriate surgical indications. And both microscopic and endoscopic approach showed acceptable graft success rate and hearing benefit.

## OTTPP-21 11:50~11:54

### EXPRESSION OF ENDOPLASMIC RETICULUM STRESS-RELATED MRNA IN OTITIS MEDIA WITH EFFUSION

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KYUNG HEE UNIVERSITY SCHOOL OF MEDICINE

DAE-WOONG KANG, MYUNG-JIN PARK, SANG-HOON KIM, JAE-YONG BYUN, SEUNG-GEUN YEO, MOON-SUH PARK

**목적:** The endoplasmic reticulum (ER) is an intracellular organelle involved in the synthesis and secretion of proteins. The ER stress response, which protects cells from cytotoxic proteins such as unfolded proteins, is related to several diseases including inflammation. In this study, we investigated the effect of ER stress on the pathophysiology of otitis media with effusion (OME). **방법:** Thirty-nine pediatric patients who were diagnosed with OME and underwent ventilation tube insertion were enrolled in this study. Exudate from the middle ear cavity was collected through ventilation insertion, and ER stress gene expression was analyzed via real-time polymerase chain reactions(P-CR). **결과:** There were no significant differences in ER stress-related mRNA expression between effusion culture-positive and culture-negative groups ( $p > 0.05$ ). Expression of the C/EBP-homologous protein (CHOP) was higher in the otitis-prone group than in the non-otitis-prone group ( $p < 0.05$ ). The most common type of fluid was mucoid, and inositol-requiring enzyme 1 $\alpha$  expression was higher in serous fluid than in mucoid, mucopurulent, or purulent fluid ( $p < 0.05$ ). **결론:** Endoplasmic reticulum stress-related responses are activated in pediatric OME patients, and specific ER-stress related pathways are related to both the characteristics of fluid and the frequency of OME. Thus, ER stress-related responses affect the pathophysiology of OME in pediatric OME patients.

## OTTPP-22 11:54~11:58

### BACTERIOLOGY AND RESISTANCE PATTERNS OF OTITIS MEDIA WITH EFFUSION

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

HYE KYU MIN, MYUNG JIN PARK, JAE YONG BYUN, MOON SEO PARK, SANG HOON KIM, SEUNG GEUN YEO\*

OTTPP-23 11:58~12:02

**DIFFERENCES IN ANTIBIOTIC RESISTANCE OF MRSA INFECTIONS IN PATIENTS WITH VARIOUS TYPES OF OTITIS MEDIA**

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**HYE KYU MIN<sup>2</sup>, MOO KYUN PARK<sup>1</sup>, DONG WOO NAM<sup>1</sup>, JAE YONG BYUN<sup>2</sup>, SEOK MIN HONG<sup>3</sup>, CHANG HOON BAE<sup>4</sup>, HO YUN LEE<sup>5</sup>, EUN-JU JEON<sup>6</sup>, MYUNG GU KIM<sup>7</sup>, SANG HOON KIM<sup>2</sup>, SEUNG GEUN YEO<sup>2</sup>**

**목적:** We investigated the epidemiological and antibiotic resistance differences in methicillin-resistant *Staphylococcus aureus* (MRSA) infections in patients with otitis media with effusion (OME), acute otitis media (AOM), chronic suppurative otitis media (CSOM), and chronic cholesteatomatous otitis media (CCOM). **방법:** We conducted a retrospective study of patients with newly identified MRSA infections from January 2009 through January 2017. Overall, 3,522 patients from 10 tertiary referral hospitals were included in the study. An antibiotic sensitivity test was performed for each isolate. **결과:** MRSA infections in patients with CSOM and CCOM were more resistant

**목적:** Following the increased use of antibiotics, the emergence of antibiotic-resistant species in pediatric patients with otitis media has become a problem in recent years. The aim of this study was to investigate change in bacterial species, antibiotic resistance, and detection rate of highly pathogenic species, such as Methicillin-resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa* according to the number of repeated ventilation tube insertion (VTI) procedures in pediatric patients diagnosed with otitis media with effusion (OME). **방법:** From May 2010 to June 2018, 158 patients under 17 years of age who were admitted to the outpatient clinic of Kyung Hee Medical Center and diagnosed as OME and underwent unilateral or bilateral VTI were included in this study. Bacterial cultures were performed on aseptically collected middle ear effusion (MEF) at the time of VTI and antibiotic sensitivity tests were performed on the identified bacteria. **결과:** Bacteria were not identified in 195 (70.1%) cultures and identified in 83 (29.9%) cultures. Coagulase-negative staphylococci (CNS) was the most frequently detected species in both the nonrecurrent group and the recurrent group. MRSA detection rate was found to be significantly higher in the recurrent group than in the non-recurrent group ( $p=0.029$ ). The two groups showed no significant difference in antibiotic resistance against all antibiotics ( $p>0.05$ ). **결론:** *Staphylococcus* species were detected most frequently in the MEF of pediatric OME patients, and the MRSA detection rate was higher in the recurrent group than in the non-recurrent group. There was no difference in antibiotic sensitivity between the two groups against all antibiotics, but resistance to penicillin G and cefoxitin was newly appeared in patients with repeated detection of same bacterial isolates.

to ciprofloxacin, clindamycin, erythromycin, gentamicin, levofloxacin, and tetracycline. Patients showed good susceptibility to rifampicin, trimethoprim/sulfamethoxazole (TMP/SMX), and vancomycin. **결론:** MRSA infections in various otitis media cases showed different resistance patterns. MRSA infections in patients with COM and CCOM were more resistant to antibiotics than those in patients with OME and AOM.

## OTTPP-24 12:02~12:06

### FACTOR ANALYSIS RELATED TO HEARING AFTER MASTOIDECTOMY WITH TYPE I TYMPANOPLASTY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY COLLEGE OF MEDICINE

JUN YOUNG LEE, BYUNG GIL CHOI, SUNG KWANG HONG, HYO JEONG LEE, HYUNG JONG KIM

**목적:** 유돌절제술 및 고실성형술의 목적은 중이내 병변을 제거하고 청각 기전의 재건을 통한 청력 개선에 있다. 선행연구를 통하여 술후 청력개선에 관련된 요인들이 보고되었지만, 많은 연구에서 제한적 자료의 한계를 언급하고 있다. 본 연구에서는 선행연구의 문제점을 보강하기 위해 만성중이염 술후 청력 결과에 미치는 요인을 분석하였고, 이를 통해 술후 청력예후를 예측하고자 하였다. **방법:** 1989년 05월부터 2018년 12월까지 만성 중이염으로 1인 술자에 의한 유돌절제술 및 1형 고실성형술 후 1년 이상 추적관찰이 된 환자 848명을 대상으로 선 정하였다. 술 후 최종 추적시 시행한 순음청력검사를 통해 기도-골도 차 10 dBHL 이하(Group A)와 초과(Group B) 두 그룹으로 분류하였고, 각 그룹에 대해 술전 이루의 유무, 이관기능, 청력 상태, 외이도협착, 고막 및 중이병변, 이소골 상태, 유양동 함기화 및 유돌동구 개존 상태 및 유돌절제술의 방법과의 연관성을 분석하였다. **결과:** 848명 중 남 289명(34%), 여 559명(66%), 나이는  $47.9 \pm 13.7$ 세, Group A 497례(59%), Group B 351례(41%)였다. Group A

에서 술전 청력 및 기도-골도 차는  $41.5 \pm 16.0$  dBHL,  $19.8 \pm 9.0$  dBHL, Group B는  $49.7 \pm 18.6$  dBHL,  $26.5 \pm 10.3$  dBHL, Group A에서 소천공 185례(37%), 중등도 천공 71례(14%), 대천공 241례(49%), Group B에서 각 81례(23%), 중등도 천공 119례(34%), 대천공 151례(43%)였고, 폐쇄동 유돌절제술과 개방동 유돌절제술은 Group A에서 492례(99%), 5례(1%) Group B에서 330례(94%), 21례(6%)였다. 이소골에서 정상연쇄와 연쇄단절간의 비율은 Group A에서 471례(95%), 26례(5%), Group B 286례(81%), 65례(19%), 유양동 함기화에서 경화상은 Group A 278례(56%), B 258례(74%), 양호한 유돌동구 개존도 및 이관기능은 Group A 277례(56%), 288례(58%), Group B 106례(30%), 146례(42%)에서 보였다. Group A가 B에 비해 술전 청력 및 기도-골도 차와 유양동 함기화에서 경화상의 비율이 통계적으로 유의하게 낮았으며, 높은 소천공의 비율 및 이소골의 정상연쇄상의 분포, 양호한 유돌동구 개존도 및 이관기능의 분포가 높았다. **결론:** 본 연구에서 술후 청력개선에 미치는 요인들을 분석하였고, 이 결과를 활용하면 술후 청력예후를 예측할 수 있고, 수술적 치료 방법의 선택에 도움을 줄 수 있을 것으로 사료된다.

## OTTPP-25 12:06~12:10

### LONG TERM SURGICAL OUTCOMES OF SUBTOTAL PETROSECTOMY IN MANAGING CHRONIC MIDDLE EAR DISEASE AND HEARING LOSS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, REPUBLIC OF KOREA

HAMZAH ALSHAikh, JUNG MEE PARK, JAE SANG HAN, JACLYN LEIGH VIDAL

**목적:** This study was performed to describe the surgical technique, investigate the indications, complications, outcomes and long-term surgical results of subtotal petrosectomy with or without cochlear implantation(CI). **방법:** Forty-one patients (13 men and 28 women, mean age  $62.4 \pm 9.0$  years) who received



subtotal petrosectomy by one surgeon (P. S. N) between April 2004 and January 2019 were included in this study. Sixteen patients underwent simultaneous or sequential CI for the hearing rehabilitation depending on the active inflammatory condition of their middle ear. One patient underwent simultaneous bone conduction implant (BCI) procedure. In all cases, after complete eradication of the pathology, mastoid cavity was obliterated with abdominal fat followed by double layered tissue of periosteum and skin. Surgical outcomes, complications and audiological results after implantable devices were analyzed. **결과:** Middle ear inflammation and cholesteatoma were completely managed with this surgical technique. During long term follow-up periods up to average 54 months, only one patient (2.4%) had post-auricular wound infection that managed by conservative care. CI was successfully placed, and active electrodes were fully inserted in all 16 patients. Only one patient (2.4%) showed the delayed extrusion of the electrode to the obliterated ear canal which was successfully managed by replacement of extruded electrode and conchal cartilage reinforcement under local anesthesia. BCI with subtotal petrosectomy seemed to be a good hearing rehabilitation option in patients with single sided deafness caused by chronic otitis media. Postoperative quality of life during the medical interview revealed the highly satisfied status of subtotal petrosectomy from both disease eradication and cosmetic viewpoints. **결론:** Subtotal petrosectomy seems to be a safe, effective surgical procedure that can be utilized in a various complicated ear conditions and can be combined well with the surgery of implantable hearing devices.

OTPPP-26 12:10~12:14

**CLINICAL CHARACTERISTICS AND SURGICAL OUTCOMES OF PEDIATRIC CHOLESTEATOMA ACCORDING TO AGE**

DEPARTMENT OF OTOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, KOREA

CHOL-HO SHIN, MIN-YOUNG KWAK, JIN-TAEK PARK, YHEREE KIM, WOO-SEOK KANG, HONG-JU PARK, JONG WOO CHUNG, JOONG HO AHN

**목적:** Chronic otitis media with cholesteatoma is a relatively rare disease in children. The pathogenesis and prognosis of this condition remain unclear. In this study, we analyzed the clinical characteristics and surgical outcomes of chronic otitis media with cholesteatoma according to age in pediatric patients. **방법:** From August 1993 to November 2011, we retrospectively reviewed the records of 213 children (156 boys and 57 girls) less than 15 years of age with pathologically confirmed cholesteatoma. We divided patients into two groups: the young group (n = 130) consisted of patients younger than 7 years, and the old group (n = 83) consisted of patients between 7 and 15 years of age. The mean follow-up period was 56.0 months. **결과:** Between the young and old groups, there were no significant differences in gender, side distribution, and reoperation rate. However, there were significant differences in the percentage of congenital cholesteatoma, type of chief complaints, and operative methods between the two groups. In addition, the young group had significantly fewer cases of mastoid invasion of cholesteatoma (27.7%) and a higher incidence of intact ossicle (84.3%) than the old group (47.0% and 51.5%, respectively). **결론:** Physicians should familiarize themselves with the clinical characteristics of pediatric cholesteatoma, especially in regard to the age distribution of this condition.

OTPPP-27 12:14~12:18

**FUNCTIONAL OUTCOME ACCORDING TO MATERIALS AND LENGTHS OF THE OSSICULAR REPLACE-**

**MENT PROSTHESIS**

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SEONGBIN PARK, KANG HYEON LIM<sup>1</sup>, DONG HEUN PARK<sup>1</sup>, SUNG JIN LIM<sup>1</sup>, YOUNG-SOO CHANG<sup>1</sup>, YOON CHAN RAH<sup>1</sup>, JUNE CHOI<sup>1</sup>

**목적:** The aim of the present study is compare the functional outcomes according to materials of ossicular replacement prosthesis after the surgical procedure of ossicular chain reconstruction in patients with chronic otitis media without cholesteatoma **방법:** Clinical records of 50 patients who underwent ossicular replacement from 2007~2017 were assessed retrospectively. The functional results after the ossicular replacement procedures were assessed by comparing the pre-operative and post-operative air-bone gap (ABG). Criteria for successful hearing result is following Postoperative air-bone gap(ABP) = <20dB or Preoperative AC PTA - Postoperative AC PTA >= 15dB or Postoperative AC PTA = <30dB And 1 of 3 criteria satisfaction is defined as success upon satisfaction **결과:** The ossicular reconstruction surgery with total ossicular replacement prosthesis is partial ossicular replacement prosthesis (PORP) in 50 patients. Polycel was used in 26 patients, titanium in 24 patients. In PORP patients, Successful rates of polycel was 76.92% and, in titanium was 87.5% noted **결론:** These results suggest titanium is a better material than polycel as ossicular replacement prosthesis in an aspect of hearing outcome in Chronic otitis media patients without cholesteatoma

**OTTPP-28 12:18~12:22**

**RESULTS OF HEARING THRESHOLD AFTER MODIFIED BONDI'S TECHNIQUE**

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND

NECK SURGERY, EWSA WOMANS UNIVERSITY, COLLEGE OF MEDICINE

JU HYUN YUN, SO JEONG LEE, SUNG WAN BYUN, SEUNG-HO SHIN

**목적:** To evaluate hearing results after modified Bondi's technique **방법:** The modified Bondi's technique was conducted for the patients whose ossicles looked intact on temporal bone CT scan. The hearing data was obtained from patients who underwent modified Bondi's technique due to chronic otitis media with cholesteatoma or adhesive otitis media from 2014 to 2018. They underwent preoperative and postoperative pure tone audiometry and consisted of 4 males and 2 females. The average age was 58.3 (STD 11.5) years old. The preoperative and postoperative hearing air and bone conduction thresholds were compared. **결과:** The preoperative average threshold was 50.4 dB (STD 24.8 dB) and its air bone gap was 20.2 dB (STD 11.2 dB). The postoperative average threshold was 56.7 dB and its air bone gap was 21.7 dB (STD 13.7dB). When preoperative air bone gap was less than 20 dB, its postoperative air bone gap was less than 20 dB. However if preoperative air bone gap was more than 20 dB, its postoperative air bone gap was more than 30 dB. **결론:** Based on our study, modified Bondi's technique should be performed with patients having air bone gap less than 20 dB to expect better postoperative hearing threshold.

**OTTPP-29 12:22~12:26**

**INHIBITORY ACTIVITY OF N-ACETYLCYSTEINE ON TYMPANOSTOMY TUBE BIOFILMS FROM METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS AND QUINOLONE-RESISTANT PSEUDOMONAS AERUGINOSA**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHOSUN UNIVERSITY COLLEGE OF MEDICINE

JI-HYE HAN, EU-RI JO, JEONGHYUN OH, SUNG IL CHO

**목적:** Biofilm formation in tympanostomy tubes causes persistent and refractory otorrhea. In the present study, we investigated the in vitro antibiofilm activity of N-acetylcysteine (NAC) against biofilm formation by methicillin-resistant *Staphylococcus aureus* (MRSA) and quinolone-resistant *Pseudomonas aeruginosa* (QRPA). **방법:** We examined the antibiofilm activity of NAC against biofilms produced by MRSA and QRPA strains using in vitro biofilm formation assay, adhesion assay, and biofilm eradication assay. Additionally, the antibiofilm activity of different concentrations of NAC against tympanostomy-tube biofilms from MRSA and QRPA strains was compared using a scanning electron microscope. **결과:** The adhesion of MRSA and QRPA strains decreased significantly in a concentration-dependent manner after treatment with varying amounts of NAC. Treatment with NAC inhibited biofilm formation of both MRSA and QRPA strains and increased eradication of preformed mature biofilm produced by MRSA and QRPA. Besides, NAC exhibited significant eradication-activity against tympanostomy-tube biofilms produced by MRSA and QRPA strains. **결론:** Our results show potent inhibition of MRSA and QRPA biofilm after treatment with NAC. NAC shows potential for the treatment of biofilms and refractory post-tympanostomy tube otorrhea resulting from MRSA and QRPA infection.

OTTPP-30 12:26~12:30

## PREVALENCE AND PATTERNS OF CANAL AND OTOLITH INVOLVEMENT IN MENIERES DISEASE COMPARISON TO VESTIBULAR NEURITIS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF

KOREA

EUN HYE CHA, YEHREE KIM, MIN YOUNG KWAK, JIN TAEK PARK, WOO SEOK KANG, JOONG HO AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** 최근에 개발된 비디오 두부충동검사(video head impulse test, vHIT)를 통해 상반고리관, 측반고리관, 후반고리관의 기능을 검사할 수 있으며, 안구 및 경부 전정유발근전위검사(ocular and cervical vestibular evoked myogenic potential test, oVEMP and cVEMP) 검사를 통해 난형낭 과 구형낭의 기능을 검사할 수 있게 되었다. 본 연구에서는 메니에르병 (Meniere's disease, MD) 환자에서의 각 전정기관의 기능 이상의 빈도를 알아보고, 그 분포 양상과 임상 예후와의 관계를 확인해보고, 전정신 경염(vestibular neuritis, VN) 환자에서의 관찰되는 소견과 비교해 보고자 한다. **방법:** 본원에서 진단받고 치료받은 64명의 definite MD환자와 71명의 급성 VN환 자에서 vHIT, oVEMP, cVEMP의 결과를 확인하여 이상소견의 분포 양상과 빈도를 비교하여 보고, MD환자에서 임상 예후와의 상관관계를 확인하였다. **결과:** MD환자에서 전정기관의 이상소견이 가장 많이 발생한 전정기관은 난형낭 으로 45%에서 비정상 소견을 보였고, 구형낭이 36%, 측반고리관이 22%, 후반 고리관이 19%, 상반고리관이 6%였다. VN환자에서는 측반고리관이 가장 흔하게(95%) 비정상 소견을 보였고, 상반고리관이 62%, 난형낭이 45%, 후반 고리관이 29%, 구형낭이 22%로 질환에 따라 자주 발생하는 전정기능 의 이상이 다른 분포를 보였다. 측반고리관과 상반고리관의 이상이 VN환 자에서 MD환자에 비교하여 의미있게 높은 비정상 소견을 보였다. MD환자에서는 20%에서 모든 검사에서 정상을 보였으며, VN환자에서는 1%에서 모든 검사에서 정상 소견을 보였으며, VN환자보다 의미있게 광범위한 이상소견을 보였다. 81%에서는 약물치료로 어지럼증의 조절이 가능하였고, 19%의 환자에서 추가적인 스테로이드주사가 필요하였고, 젠타마이신 주사가 필요한 경우는 5%, 내림프관압술은 2%에서 필요하였으며, 검사 결과의 심한 정도와 비례하지 않았다. **결론:** 비디오 두부충동검사와 안구 및 경부 전정유발근전위검사를 통해 전정신 경염 환자와 메니에르병 환자에서 침범된 전정기관의 이

상 정도와 빈도가 다를 수 있었다. 전정신경염은 주로 측반고리관과 상반고리관을 흔하게 침범하였으나, 메니에르병은 주로 이석기관을 흔하게 침범하는 특징을 보였다.

## OTTPP II

### 이과 II

13:30~15:34 • 세미나실6

Chairperson(s) : 이주형(가천의대), 이환호(고신의대)

#### OTTPP-31 13:30~13:34

#### DEVELOPMENT OF VIRTUAL REALITY-ASSISTED VESTIBULAR REHABILITATION PROGRAM USING EYE MOVEMENT TRACKING SYSTEM

DEPARTMENT OF OTORHINOLARYNGOLOGY, GANGNAM SEVERANCE HOSPITAL, YONSEI UNIVERSITY COLLEGE OF MEDICINE

SEUNGHO SHIN, YU TAE JEON, HAE EUN NOH, JUNG GHI KIM, JI HYUNG KIM, EUN JIN SON

**목적:** Vestibular rehabilitation has been shown effective in improving symptoms due to various vestibulopathies. Vestibulo-ocular reflex (VOR) exercises are used to promote adaptation and gaze stability. Recently, virtual reality(VR) technology has been applied in the field of vestibular science, since it offers unique advantage of visual immersion, and using VR for vestibular rehabilitation has gained interest. Here, we introduce our efforts to develop a VR-assisted program using a eye movement tracking system for vestibular rehabilitation. **방법:** VR contents for VOR exercises were developed for x1 and active eye-head movement exercises, bases on conventional vestibular rehabilitation programs. To increase difficulty, the background

environment was designed as a clinic room or visually challenging patterns. The usability and simulator sickness associated with the VOR exercises were evaluated in 10 healthy subjects. Also, survey was taken for feedback after the VR-assisted vestibular rehabilitation exercises. **결과:** The subjects performed the VOR exercises, following the embedded instructions of the VR-assisted vestibular exercises to be highly usable (>80 score on the system usability scale), and reported no difference in usability between easy and difficult background settings. **결론:** The current study demonstrated the usability and safety of a VR-based vestibular rehabilitation exercise program using eye tracking system. The eye-tracking system provides feedback to the users about their performance during VOR exercises for encouragement and compliance, and the data can be used for further analysis.

#### OTTPP-32 13:34~13:38

#### CHANGE OF VIDEO HEAD-IMPULSE TEST(VHIT) RESULT DURING THE ATTACKS OF MENIERE'S DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, INHA UNIVERSITY COLLEGE OF MEDICINE, INCHEON, KOREA

HYUN JI KIM, HONG JU KIM, MIN JI KIM, KYU-SUNG KIM

**목적:** 메니에르병 환자에서 온도안진검사 반고리관 마비는 감소하였으나 비디오 두부충동검사에서는 정상 이득을 보여 두 검사 결과 사이에 불일치를 보이는 경우가 많아 앞서 이에 대한 분석을 위해 많은 연구들이 진행되었다. 본 연구에서는 메니에르병으로 확진된 환자에서 어지럼 발작을 보이는 급성기와 비급성기에서 비디오 두부충동검사 결과의 변화를 분석하고자 하였고 이를 통해 메니에르병의 어지럼 발작시에 비디오 두부충동검사의 임상적 의의를 확인하고자 하였다. **방법:** 2017년 1월부터 2019년 6월까지 인하대병원 이비인

후과를 내원하여 메니에르 병으로 진단받은 사람을 대상으로 의무기록을 분석하였다. 어지럼에 대한 평 가로 비디오 안진검사, 비디오 두부충동검사의 연속적인 결과를 확인하였고 이를 환자 증상 및 청력 상태, 온도안진 검사 등의 기타 전정검사 결과와 비교하여 분석하였다. **결과:** 명확한 메니에르병으로 진단된 환자 중 내원시 주관적 증상인 어지럼과 청력 저하, 이명, 이충만감을 호소한 환자들에서 모두 자발안진을 확인하였다. 비급성기에 온도안진검사와 비디오두부충동검사를 동시에 시행한 33명의 환자 중 반고리관 마비 20이상을 보인 11명을 분석한 결과 반고리관 마비는 36%로 저명한 감소를 보였으나, 비디오 두부충동검사의 평균 이득은 1.03으로 정상 으로 확인되었다. 급성기와 비급성기에 비디오두부충동검사를 모두 시행한 8명 의 환자를 분석하였을 때 급성기의 평균 이득은 0.79로 비급성기의 1.055에 비해 이득의 감소를 보였으며, 이 중 응급실을 내원하여 2시간 이내에 검사를 시행한 환자의 경우 평균 이득이 0.54로 감소하였다. **결론:** 메니에르 병 환자에서 온도안진검사와 비디오 두부충동검사 결과에는 차이를 보이고, 확인된 반고리관 마비가 있는 경우에도 비디오 두부충동검사결과는 정상 소견을 보이는 경우가 많다고 알려져 있다. 따라서 비디오 두부충동검사는 메니에르병에 중요한 진단적 가치를 가지는 검사는 아니나, 본 연구에서 메니에르병 급성기 어지럼 발작 시 비디오 두부충동검사에서의 이득의 감소를 보이며, 그 어지럼 정도가 심할수록 큰 이득의 감소를 보였다. 이에 비디오 두부충동검사는 어지럼 발작 상황에서 전정기능의 상태를 민감하게 반영하며 이를 객관화할 수 있어 메니에르 환자에서 급성기 발작 시 어지럼 정도와 회복정도를 평가하는 도구로 임상적 의의를 갖는다.

### OTTPP-33 13:38~13:42

#### PROGRESSION OF HEARING LOSS IN UNILATERAL MENIERE'S DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY, CHA BUNDANG MEDICAL CENTER, CHA UNIVERSITY

TAE HYEON SHIN, CHEONG SE WON, SO YOUNG

KIM, CHANG HO LEE, HYOUNG-MI KIM

**목적:** A major challenge in managing patients with Meniere's disease (MD) is its heterogeneous clinical presentation. Identifying distinct clinical patterns among MD patients would enable clinicians to predict the disease course and prognosis in individual patients.

**방법:** A group of patients was enrolled with a diagnosis of definite unilateral MD and all patients were followed 8 years thereafter. The patients older than 65 years were excluded. **결과:** Hearing loss and tinnitus intensity was progressed in one-third of MD patients with disease duration, which resulted in profound sensorineural hearing loss at the end of follow-up. A group of young male patients showed more severe type of hearing loss and the prevalence of a history of allergy was significantly higher in these patients. **결론:** Allergy may be a risk factor for the development hearing loss in unilateral MD patients.

### OTTPP-34 13:42~13:46

#### CLINICAL CHARACTERISTICS OF THE PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME COMPLAINING CHRONIC DIZZINESS, PRELIMINARY STUDY

DEPARTMENT OF OTORHINOLARYNGOLOGY, INHA UNIVERSITY COLLEGE OF

CHANG-BIN YUN<sup>1</sup>, KI-JONG HYUN<sup>1</sup>, YOUNG-HYO KIM<sup>1</sup>, KYU-SUNG KIM<sup>1</sup>, HYUN-JI KIM<sup>1</sup>

**목적:** To evaluate the clinical characteristics of patients with obstructive sleep apnea syndrome complaining chronic dizziness. **방법:** Patients diagnosed with obstructive sleep apnea syndrome and underwent polysomnography and had continuous positive airway pressure treatment were included in this study. Those who had previously suffered dizziness were excluded from the study. Demographic and clinical data includ-

ing the symptoms and signs of sleepiness and dizziness were investigated. Polysomnography and questionnaires (Pittsburgh Sleep Quality Index, Insomnia Severity Index) were analyzed as sleepiness index. Video head impulse test, videonystagmography, and questionnaires (Dizziness Handicap Inventory, Vestibular Disorders Activities of Daily Living Scale) score were analyzed as dizziness index. **결과:** Obstructive sleep apnea syndrome patients were categorized into those who complained of dizziness and those who did not. Existence of underlying diseases, age, and weight were not different between the groups. Most snoring female patients complained of dizziness. Male patients, on the other hand, complained of dizziness only in about 30% of cases. Sleep related index including Friedman classification, Muller maneuver, polysomnography, questionnaires didn't show a meaningful difference. Among dizziness related index, video head impulse test gain values were not significantly different. However, the average score of Dizziness Handicap Inventory shows 18.7 in patients with dizziness compared to 5.5 in patients without dizziness. Dizziness was often associated with a change in posture and headache. Most cases complained non-rotatory type dizziness. **결론:** Most female patients of obstructive sleep apnea syndrome complained of chronic dizziness. Among patients with obstructive sleep apnea syndrome, Dizziness Handicap Inventory of the group who complained of dizziness was higher than the group who did not complain of dizziness, but the objective indicator was not different.

OTTPP-35 13:46~13:50

#### OPTIMIZATION FOR THE MEASUREMENT OF VESTIBULAR STIMULATED EVOKED POTENTIAL

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AND NECK SURGERY DANKOOK UNIVERSITY HOSPITAL, CHEONAN, <sup>3</sup>DEPARTMENT OF BIOMEDICAL ENGINEERING, DANKOOK UNIVERSITY, COLLEGE OF MEDICINE, CHEONAN

JAE-HUN LEE<sup>1</sup>, HEE-WON JEONG<sup>1</sup>, HAN-SEUNG NAM<sup>3</sup>, HYEONGBEOM KIM<sup>1,3</sup>, NATHANIEL CARPENA<sup>1</sup>, SO-YOUNG CHANG<sup>1</sup>, JI EUN CHOI<sup>1,2</sup>, MIN YOUNG LEE<sup>1,2</sup>, PHIL-SANG CHUNG<sup>1,2</sup>, ILYONG PARK<sup>1,3</sup>, JAE YUN JUNG<sup>1,2</sup>

**목적:** Dizziness, vertigo, and imbalance are among the most common difficulties in the aging society. Animal studies can be preceded in order to better understand balance disorder and changes related to aging. Vestibular stimulated evoked potential (VsEP) is one of the common measurements for vestibular function in animal research. In this study, 7-week-old Sprague Dawley rats were implanted with head bolts for vibration before the measurement. We optimized the VsEP responses by applying various parameters including jerk, polarity, duration were tested. **방법:** Various angles of head and positions of body were also investigated. **결과:** The results showed that alternative polarity with 0.5 msec of duration showed robust peaks and overall waveform. For the position of animal, zero degree of head position against the vibrator with supine position showed the most prominent VsEP responses. **결론:** VsEP can be measured differently depending on the measurement parameters. The results of this study could be an essential background for vestibular studies using an animal model.

OTTPP-36 13:50~13:54

#### IMMUNOHISTOCHEMICAL FINDINGS OF THE VESTIBULAR MEMBRANE OF THE SACCULE

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BOSTON MA

SUNG IL NAM<sup>1</sup>, JOE C ADAMS<sup>2</sup>

**목적:** The vestibular membrane that borders the endo-perilymphatic space of the saccule is morphologically specialized in humans by a conspicuous thickening in the anterior portion of the membrane. In the present report, a different kind of regional specialization of the saccular vestibular membrane in mice is reported **방법:** Male CBA/CaJ mice, 6–8 weeks old (Jackson Labs) were anesthetized with urethane and exsanguinated by intracardial perfusion with phosphate buffered saline (PBS), followed by perfusion with 10% formalin in PBS. Immunostaining was done with the following antibodies: rabbit anti-connective tissue growth factor (CTGF), Cell Sciences, Canton, MA, CPC100, rabbit anti-aquaporin 1 (Aqp1), Millipore, Billerica, MA, AB2219, and rabbit anti-transient receptor potential channel 3 (TRPC3), Alomone Labs, Jerusalem, Israel, ACC-016. Primary antibodies were diluted in 1% NHS in PBS as indicated in the figure captions and placed on the tissue in a humidified chamber and incubated overnight at room temperature **결과:** Immunostaining of the vestibular membrane in mouse supports the concept that it has functionally specialized divisions. The posterior portion of the membrane immunostains for aquaporin 1, which indicates that this portion of the membrane is specialized for water permeability and may play a role in control of endolymph volume. In contrast, the anterior portion of the membrane immunostains for the transient receptor potential channel TRPC3. **결론:** Taken together these observations indicate that the vestibular membrane is complex and that it may play an active role in endolymph volume regulation, rather than acting as a passive barrier between the two distinct labyrinthine fluids.

OTTPP-37 13:54~13:58

### MINIMIZATION OF SKIN INCISION AT PREAURICULAR SINUSECTOMY USING A TRANS PIT APPROACH AND SURGICAL MICROSCOPY

DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY, CHUCHEON SACRED HEART HOSPITAL, HALLYM UNIVERSITY MEDICAL CENTER, CHUNCHEON, REPUBLIC OF KOREA,

KANG HYUN LEE, SUNG MIN LEE, SANG WOOK KIM, KI JOON PARK, JUN HO LEE

**목적:** We developed a surgical procedure which includes a simple sinusectomy without opening the sinus whilst attempting to minimize the skin incision **방법:** A total of 34 patients with preauricular sinus were treated. In six patients, this technique was performed bilaterally, so a total of 40 ears were enrolled and analyzed for recurrence rate and surgical outcome. A database was created which included patient age, the preoperative and postoperative incision size, suture materials used, and complications. Incisional size according to the previous infection condition and incision and drainage (I & D) history were analyzed. **결과:** The mean initial skin incision length was  $0.75 \pm 0.40$  cm and mean incision length after skin suture was  $0.81 \pm 0.42$  cm. The young group under 10 years of age had a mean initial skin incision length of  $0.56 \pm 0.06$  cm, and mean incision length after skin suture was  $0.58 \pm 0.08$  cm. Suture materials were Nylon 6-0 for 14 ears, Nylon 7-0 for 20 ears, and Nylon 8-0 for 6 ears. The incidence of minor complications (immediate wound dehiscence, wound opening at a previous I & D region, keloid formation) was 7.5%. **결론:** Our method overcomes potential problems with esthetics in addition to reducing the recurrence rates of preauricular sinusectomy. With our technique, minimization of skin incision length is possible without the risk of recurrence. The use of fine suture materials and not using drainage avoids additional skin trauma.

OTTPP-38 13:58~14:02

## ASSESSMENT AND MANAGEMENT OF OTOTHEMATOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL AND CHONNAM NATIONAL UNIVERSITY HOSPITAL, GWANGJU, KOREA

JONG YUAP SEONG, HYE BIN JANG, HONG CHAN KIM, HYONG-HO CHO

**목적:** The otomematoma is not a rare disease but there are no accurate guidelines to solve the problem. So our purpose is to determinate the proper approach and management of otomematoma refer to thesis. **방법:** Retrospective chart review of 62 patients during January 1st 2003 to June 30th 2019 in a tertiary hospital was performed. The patients with auricular swelling considered as otomematoma. They underwent some procedures like needle aspiration with/without intralesional steroid injection and incision and drainage depend on surgeon's decision and the patient's desire. We checked the demographic factors and success ratio. **결과:** Only needle aspiration can make recurrence of otomematoma. The method of Incision and drainage had better positive results to solve the problem(78.6%). Intralesional steroid injection was the most effective method to treat otomematoma(94.7%) but may need to additional several injections. **결론:** We should to treat the patients with otomematoma properly. Needle aspiration with intralesional steroid injection or incision and drainage are a reasonable and safe option for patients with otomematoma.

OTTPP-39 14:02~14:06

## CLINICAL FEASIBILITY OF THICKNESS-OBLIQUE RECONSTRUCTION OF TEMPORAL BONE CT IMAGES IN TEMPORAL BONE FRACTURE

DEPARTMENT OF OTORHINOLARYNGOLOGY, UIJEONGBU ST MARYS HOSPITAL, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, REPUBLIC OF KOREA

BEOMCHO JUN, YESUN CHO, DOYEON KIM

**목적:** The temporal bone fracture could damage the auditory and vestibular organs and in severe cases can lead to catastrophic complications by leakage of CSF or damage of the carotid artery. Therefore, direction of the fracture line of temporal bone is important, however, Fracture line analysis of two-dimension-al temporal bone CT reveals that the relationship of the fracture line in the plane is difficult to understand in three dimensions. The purpose of this study was to evaluate the usefulness of the thickness-oblique reconstruction in the CT analysis of temporal bone fracture patients to determine the three-dimensional relationship of the fracture line. **방법:** The conditions of taking CT image were as follows. The FOV (field of view): 104 x 104 mm<sup>2</sup>. The thickness of slice: 0.75mm. Thickness-oblique reconstruction images were obtained with the V-works 4.0 software program (Cybermed, Seoul, Korea) using axial scanning of high-resolution temporal bone CT of the fracture line. The average of thickness of oblique images was 6mm. The reformatted image was analyzed at the site where the fracture was obvious, and the fracture line was traced by changing the direction. **결과:** It has been found that the relationship between the fracture lines that were considered separately could be a connected line through the oblique-thickness image. Especially, the complicated fracture line was helpful to not only identify the fracture line of zygoma, maxilla and mandible but also identify the fracture line involve the cranial base. **결론:** The location of the temporal bone fracture line is important information in determining the surgical plan and the prognosis of the patient. The thickness-oblique reconstruction in the CT analysis of temporal bone fracture will helpful to identify the three-dimensional relationship of the



fracture lines.

**OTTPP-40 14:06~14:10**

**A HIGH NEUTROPHIL-TO-LYMPHOCYTE RATIO IS ASSOCIATED WITH RECOVERY FROM RAMSAY HUNT SYNDROME**

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SOO YOUNG CHOI, MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** The aim of this study was to evaluate the predictive power of the neutrophil-to-lymphocyte ratio (NLR) for the severity and outcomes of RHS. **방법:** From 2007 to 2017, a retrospective study of 102 hospitalized patients with RHS was conducted. The degree of paralysis was assessed by determining the House-Brackmann(H-B) grade. Obesity, hypertension, and diabetes mellitus were assessed, and the blood NLR and platelet-to-lymphocyte ratio were determined. The patients received steroids and antivirals, and were followed in the outpatient department at 1, 4, 12, and 24 weeks. **결과:** The H-B grade of the high-NLR group was significantly higher than that of the normal-NLR group ( $p = 0.039$ ), and the probability of complete recovery was significantly lower in the high-NLR group ( $p = 0.048$ ). **결론:** Patients with RHS who have an elevated NLR have poor outcomes in terms of the H-B grade. Therefore, the NLR may be useful for evaluating the prognosis of patients with RHS.

**OTTPP-41 14:10~14:14**

**COMPARATIVE PROGNOSIS IN PATIENTS WITH**

**RAMSAY-HUNT SYNDROME AND BELL'S PALS**

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**목적:** Patients with Ramsay-Hunt syndrome have a poorer prognosis than patients with Bell's palsy. Factors of metabolic syndrome affecting prognosis were therefore compared between patients with Ramsay-Hunt syndrome and those with Bell's palsy. **방법:** This retrospective study included 106 with Ramsay-Hunt syndrome and 182 with Bell's palsy. Age, sex, body mass index, blood pressure, blood test results, and ENoG results, stratified by House-Brackmann grade, were compared in patients with Ramsay-Hunt syndrome and Bell's palsy. Both groups of patients were treated with steroids and the antiviral agent famciclovir. **결과:** Age, sex, body mass index, dyslipidemia, triglyceride, diabetes, hypertension, and onset of palsy did not differ in patients with Ramsay-Hunt syndrome and Bell's palsy. Rates of favorable recovery in patients with severe facial palsy and DM were lower in patients with Ramsay-Hunt syndrome than with Bell's palsy and were also lower in low-weight, normal weight, and overweight patients with Ramsay-Hunt syndrome than with Bell's palsy. Rates of favorable recovery in patients with severe facial palsy and normal HDL, as well as in patients with severe facial palsy and  $<10\%$  ENoG, were lower in patients with Ramsay-Hunt syndrome than with Bell's palsy. **결론:** Among patients with severe facial palsy, along with diabetes and  $<10\%$  ENoG, unfavorable recovery rates were significantly higher in those with Ramsay-Hunt syndrome than with Bell's palsy.

## OTTPP-42 14:14~14:18

**PREDICTIVE VALUES OF NEUTROPHIL TO LYMPHOCYTE RATIO (NLR), PLATELET TO LYMPHOCYTE RATIO (PLR), AND OTHER PROGNOSTIC FACTORS IN PEDIATRIC BELL'S PALSY PATIENTS**

DEPARTMENT OF OTORHINOLARYNGOLOGY, GACHON UNIVERSITY GIL HOSPITAL

DONG HYUN KIM, RYUN HA, JAE HWAN OH, TAE KYU KANG, CHANG HYUN CHO, JUNSUK KIM, JU HYOUNG LEE

**목적:** Bell's palsy (BP) is the most frequent cause of unilateral facial paralysis, and inflammation is believed to play an important role its pathogenesis. Due to its rarity, however, no consensus has been reached regarding optimum treatment or factors affecting prognosis. In the present study, treatment outcomes and prognostic factors of BP were investigated in pediatric patients who underwent steroid therapy. The goal was to investigate the relationship between BP and inflammation using multiple inflammatory markers, including neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio(PLR), mean-platelet-volume(MPV), and red cell distribution width(RDW). **방법:** Fifty-four patients diagnosed with BP and 39 healthy controls were enrolled in this retrospective. Demographic characteristics and complete blood cell count test results were compared. In addition, prognostic factors were sought by dividing the 54 BP patients to 2 groups according to the House-Brackmann grading system: low grade BP (grades II, III); and high grade BP(grades IV, V). Serum samples were analyzed retrospectively on initial presentation and on day 7 of admission. Meaningful hematological parameters, including NLR, PLR, MPV, and RDW. **결과:** NLR values in the BP group were significantly higher than in the control group. The NLR value in the two groups of BP patients differed significantly. The mean PLR value in the BP

group was higher than in control group; however, there were no significant differences between the low-grade and high-grade BP groups-, nor were there any statically significant differences in the other characteristics. **결론:** NLR and PLR values are readily accessible parameters that may be useful prognostic markers in pediatric patients with BP. Further studies are required to confirm these results and their utility in predicting prognosis and treating pediatric patients with BP.

## OTTPP-43 14:18~14:22

**THE HISTONE DEACETYLASE CLASS I, II INHIBITOR TRICHOSTATIN A DELAYS PERIPHERAL NEURODEGENERATION**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** In this study, we revealed the effect of TSA(Trichostatin A) on the process of peripheral neurodegeneration. **방법:** Explant culture, Teased nerve technique, Immunohistochemistry, Western blotting **결과:** We demonstrate that TSA, which targeted HDAC(histone deacetylase)s, acted on Schwann cells and effectively suppressed key phenotypes of peripheral nerve degeneration, including demyelination, axonal degeneration, and trans-dedifferentiation and proliferation of Schwann cells. Overall, the application of TSA to regulate HDACs in Schwann cells could be an effective way to delay peripheral neurodegeneration. **결론:** TSA could be a potential drug for patients suffering from peripheral neurodegeneration-related diseases.

## OTTPP-44 14:22~14:26

**USEFULNESS OF TEMPORAL BONE MRI FOR PATIENTS WITH SUDDEN SENSORINEURAL HEARING LOSS : HIGH FREQUENCY VS. LOW FREQUENCY HEARING LOSS**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

DOYEON KIM, JUNG HO AHN, HONG-JU PARK, JONG WOO CHUNG, WOO SEOK KANG

**목적:** To identify the usefulness of temporal bone MRI for patients with sudden sensorineural hearing loss and to figure out the association between the types of hearing loss and the presence of vestibular schwannoma. **방법:** A total of 172 patients with sudden sensorineural hearing loss who took temporal bone MRI between 2013–2017 at Asan Medical Center were included. The low frequency hearing loss type meets the following criteria: the average hearing level at 125, 250, and 500 Hz is at least 10 dB worse than that at 2, 4, and 8 kHz, and there is less than 10 dB difference in the hearing level at 1 kHz in comparison with that at both the adjacent frequencies (500 Hz and 2 kHz). Otherwise, patients were classified as high frequency type. 17 low frequency hearing loss patients and 155 high frequency hearing loss patients were enrolled. Baseline characteristics of the two groups such as age, sex and location were analyzed using independent T-test and chi-square test. The association between the types of hearing loss and the presence of vestibular schwannoma was analyzed using chi-square test. **결과:** Baseline characteristics of the patients such as age, sex and location showed no statistically significant difference between the two groups. The prevalence of vestibular schwannoma among high frequency type was 8.4% and the prevalence of vestibular schwannoma among of low frequency type was 0%. **결론:** Low frequency hearing loss patient had much lower prevalence of vestibular schwannoma than high frequency hearing loss patients.

ence of vestibular schwannoma than high frequency hearing loss patients.

## OTTPP-45 14:26~14:30

**RADIOLOGICAL ANALYSIS OF ACUTE FACIAL PALSY**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD&amp;NECK SURGERY, COLLEGE OF MEDICINE, DANKOOK UNIVERSITY, CHEON-AN, REPUBLIC OF KOREA

MIN TAE KIM, KI YONG CHOI, JI EUN CHOI, MIN YOUNG LEE, JAE YUN JUNG

**목적:** 말초성 안면 마비의 예후 평가 검사는 ENoG, EMG 등이 임상적으로 사용되고 있지만 그 이외 연구는 많이 이루어지고 있지 않다. 저자들은 MRI의 조영증강 정도와 재구성(Reconstruction)을 통한 안면신경의 단면적을 측정하여 이의 임상적 의미에 대해 연구하였다. **방법:** 2013년부터 2018년까지 본원 이비인후과의 진료를 받은 편측 말초성 안면마비 환자 중, 증상 발생 10일내 MRI를 촬영한 자를 대상으로 후향적 연구를 시행하였다. 외상이나 종양 등의 원인에 의한 안면 마비이거나, 대뇌 혹은 후미로병변이 MRI상 관찰되거나, 이전에 안면 마비의 병력이 있거나, MRI상 안면신경이 추적되지 않는 자는 제외하여 총 30명을 대상으로 하였다. MRI는 양측의 내이도 기저부(fundus)위치의 밝기를 비교해 조영증강 정도를 확인하였으며 parasagittal reconstruction 이미지를 이용해 안면신경의 높이(H), 너비(W), 단면적( $\pi \cdot H/2 \cdot W/2$ )을 측정하였다. 2명의 독립된 측정자에 의해 이중으로 측정하였으며, 병측과 건측을 비교하였으며 또한 병측의 단면적 및 조영증강이 각종 임상요소와 상관성이 있는지 조사하였다. 초진 시 신경마비의 중증도(House-Brackmann Grade, H-B Gr), 증상 발생 후 MRI 촬영시기, Neutrophil/Lymphocyte ratio, 신경전도검사(Electroneuronography, ENoG) 등의 임상요소에 대하여 비교하였다. **결과:** 평균 연령은  $42.0 \pm 15.0$  세, 우측은 17명, 좌측은 13명이었다. 병측의 안면신경 평균 폭, 너비, 단면적은  $1.063 \pm 0.195$  mm, 1.170

$\pm 0.223$  mm,  $0.997 \pm 0.339$  mm<sup>2</sup>였으며 건측에 비해 증가해 있었다( $p < 0.05$ ). 병측의 안면신경 단 면적을 초진 시 H-B Gr, 증상 발생 후 MRI 촬영시기, ENoG, Neutrophil/Lymphocyte ratio와의 상관성을 조사하였고, 그중 유의한 상관관계를 보인 것은 ENoG 뿐이었다. ( $r = -0.592$ ,  $p < 0.05$ ). 병측의 단면적이 커질수록 ENoG 값은 작았다. 그리고 병측의 안면신경은 건측에 대해 조영이 증강되어 있었으며 ( $p = 0.001$ ) 병변측과 건측의 조영증강 비율은 병변측 안면신경의 높이와 유의한 상관관계를 보였다( $p = 0.006$ ). 그 외에 유의한 상관관계를 보인 임상요소는 없었다. **결론:** 안면마비환자의 병측 신경의 높이, 너비, 단면적은 모두 유의하게 증가하였고, ENoG 값이 클수록 면적이 작았다. 병측 안면신경의 높이와 조영증강 정도는 유의한 상관관계를 보였으나 조영증강 정도와 다른 임상요소와의 관련성은 없었다.

#### OTTPP-46 14:30~14:34

### INNER EAR PROBLEMS IN PATIENTS WITH BLUNT HEAD TRAUMA

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**목적:** The aim of study was to determine the incidence and characteristics of inner ear problems in patients with blunt head trauma, and to evaluate factors related to inner ear problems. **방법:** This prospective study was conducted on 102 patients with blunt head trauma from May 2018 to December 2018. After finishing critical care, 101 patients were referred to ENT clinic. Assessment included cause of trauma, severity of trauma, radiologic evaluation, types of hearing loss, and characteristics of nystagmus. **결과:** A total of 66

patients completed routine ENT consultation. During ENT consultation, 44 patients (67%) were identified with trauma related hearing loss or dizziness. Inner ear problem defined as patients who had sensorineural hearing loss or showed nystagmus. A total of 32 patients (48%) were classified as patients with inner ear problems, except for patient with conductive hearing loss and subjective dizziness. There were no significant differences of age, sex, cause of trauma, duration from trauma to ENT consultation, and duration of ICU care between trauma patient with and without inner ear problem. There was significant association between trauma patients with inner ear problem and severe Abbreviated Injury Scale (AIS>4) of head ( $p = 0.009$ ). There was no significant association between trauma patient with and without inner ear problem and the presence of temporal bone fracture ( $p = 0.339$ ). **결론:** About half of patients (48%) with blunt head trauma showed trauma related inner ear problems. Patients with inner ear problems were significantly more likely to have a head AIS of 4 or greater. The presence of temporal bone fracture was not significantly associated with inner ear problems. Therefore, even without temporal bone fractures, it is important to obtain a patient history specific to hearing loss or dizziness and to provide appropriate referrals.

#### OTTPP-47 14:34~14:38

### SUDDEN SENSORINEURAL HEARING LOSS: IS THERE A RELATIONSHIP BETWEEN THE DRAINAGE PATTERNS OF THE DURAL VENOUS SINUS AND HEARING RECOVERY?

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WOONGSANG SUNWOO

**목적:** To analyze whether there is a correlation be-

tween draining patterns of the dural venous sinuses and 1) affected side of sudden sensorineural hearing loss (SSNHL) and 2) hearing recovery. **방법:** Study Design: Retrospective study. Setting: Tertiary referral hospital. Patients: Adult patients with unilateral SSNHL. Interventions: All 64 patients were treated with oral methylprednisolone. In 43 patients, intratympanic dexamethasone injection was performed along with oral steroid. Main outcome measures: 1) The dominance of the inferior petrosal sinus (IPS) on the affected side and the ipsilateral transverse-sigmoid sinus (TS/SS) as demonstrated by three-dimensional contrast-enhanced magnetization-prepared rapid gradient-echo sequence. 2) Recovery of hearing defined as average thresholds returning to better than 25 dB or within 10 dB of the unaffected ear. **결과:** Asymmetrical venous drainage of the dural sinuses proved to be frequent (53.1% in IPS; 82.8% in TS/SS). The dominant side of the IPS or TS/SS alone was independent from the affected side. However, the relationship between the ipsilateral IPS and TS/SS showed a significant negative correlation. Interestingly, the recovery rate in patients with hypoplastic IPS and dominant TS/SS on the affected side was significantly higher than that in the other patients (60% versus 20.4% within 2 weeks; 77.8% versus 29.6% after 3 months). **결론:** Hypoplastic IPS combined with ipsilateral dominant TS/SS might be the anatomical background, which provides a predisposing factor for the development of cochlear venous insufficiency in SSNHL patients. This presumptive evidence of venous etiology also correlates with better hearing prognosis of SSNHL regardless of modality of treatment.

OTTPP-48 14:38~14:42

#### A NOVEL WATER OCCLUSION TEST FOR DISORDERS CAUSING PULSATILE TINNITUS: OUR EXPERIENCE IN 29 PATIENTS

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**목적:** To describe the results of water occlusion test and investigate its clinical implication in pulsatile tinnitus. **방법:** Retrospective analysis of 29 patients with pulsatile tinnitus with identifiable radiologic findings. Water occlusion test was performed by filling the external auditory canal with water and the patients were asked whether the pulsatile tinnitus disappeared, decreased or increased. Surgical resurfacing or transarterial embolization was done according to the suggested pathology. The results of water occlusion test were characterized according to the identified radiologic abnormalities. **결과:** Venous sinus dehiscence (VSD) was the most common cause (24 of 29, 83%), dehiscence of sigmoid sinus was identified in 92% (22 of 24) and of jugular bulb in 13% (3 of 24). Water occlusion test made the pulsatile tinnitus to disappear in 83% (20 of 24), decrease in 13% (3 of 24), and persist in 10% (1 of 24). All the patients with VSD reported a subjective tinnitus which could not be heard by an examiner. Seven of them who reported the disappearance of tinnitus by water occlusion test underwent a surgical resurfacing with complete cessation of the tinnitus. For 4 patients with arteriovenous fistula, the pulsatile tinnitus was audible with a stethoscope. All

the patients described an increase of pulsatile tinnitus by water occlusion test. One patient was treated with transarterial embolization successfully. In one patient with superior canal dehiscence, water occlusion test increased their pulsatile tinnitus. **결론:** The pulsation of VSD may directly cause the tympanic membrane to move through the air cushion effect of the middle ear cavity resulting in pulsatile tinnitus, which is different from AVF where the turbulent blood flow is heard by transmission through the bone to the cochlea. Our novel water occlusion test may provide a logical insight of the pathophysiology of the pulsatile tinnitus and assist with the choice of an effective further diagnostic and treatment options.

OTTPP-49 14:42~14:46

#### SUDDEN SENSORINEURAL HEARING LOSS ASSOCIATED WITH INNER EAR LESIONS DETECTED BY MAGNETIC RESONANCE IMAGING

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**목적:** There have been relatively few studies on the clinical characteristics of intra-labyrinthine hemorrhage (ILH) and labyrinthitis versus those regarding IAC tumors in magnetic resonance imaging(MRI). Our purpose was to investigate the frequency of those IAC lesions on MRI and their clinical characteristics. **방법:** Initial MRIs of 200 patients with SSNHL (93 men, 107 women; mean age = 48.61 years, range: 18 ±84 years) were performed. All patients were hospitalized at the time of diagnosis of SSNHL and were administered the same treatment protocol. Patients were divided into idiopathic and secondary groups according to their MRI results. After discharge, they underwent follow-up audiometry and clinical ex-

amination at predetermined intervals (2 weeks, 1, 2, 4, and 6 months, and 1 and 2 years) **결과:** Of the 200 patients, 25 (12.55%) who had abnormal findings suggesting inner ear lesions on MRI were assigned to the secondary SSNHL group; within this group, 10 patients (10/200, 5%) had a tumor invading the IAC, 7 (7/200, 3.5%) had ILH, 6 (6/200, 3%) had labyrinthitis, and 2 (1%) had a structural deformity of the IAC. The secondary group showed significantly poor recovery of hearing function compared with that in the idiopathic group. Additionally, patients with such lesions showed significant canal paresis on the lesion side at an early stage and a high prevalence of benign paroxysmal positional vertigo(BPPV) **결론:** In conclusion, the prevalence of non-tumorous lesions on MRI represents common findings and showed a poorer treatment response than that of vestibular Schwannoma in patients with SSNHL. Abnormal canal paresis, spontaneous nystagmus directed to the contralesional side, and positional vertigo would be the clinical presentation of SSNHL with IAC lesions, in which the presence of acute prolonged vertigo or positional vertigo compatible with BPPV suggests the possibility of a non-tumorous lesion, such as ILH or a labyrinthitis rather than an IAC tumor.

OTTPP-50 14:46~14:50

#### PREDICTION OF TREATMENT OUTCOME IN SUDDEN SENSORINEURAL HEARING LOSS: MACHINE LEARNING MODEL

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HAYOUNG BYUN<sup>1</sup>, JAE HO CHUNG<sup>1</sup>, SEUNG HWAN LEE<sup>1</sup>, TAE HYUN KIM<sup>2</sup>

**목적:** The etiology of sudden sensorineural hearing loss(SSNHL) is unclear and mostly idiopathic. This uncertainty makes it difficult to manage the patients with SSNHL. The aim of the study was to establish the predictive model of hearing recovery using clinical information data in SSNHL. **방법:** Medical records of 606 SSHL patients who managed with high dose steroid and salvage intratympanic steroid between January 2013 and December 2018 were used in the study. Clinical information of hearing level, accompanying ear symptoms, underlying disease were used as parameters for predicting treatment outcome. Hearing recovery was defined as AAO-HNS criteria (eg. Class A, B, C, and D). Using this small number of datasets, we train multiple neural networks which predict treatment outcomes, and form an ensemble of multilayer perceptron (MLP) to avoid overfitting problem due to data scarcity. **결과:** We train the networks using 515 out of 606 datasets, and evaluate with the rest of them (i.e., 91 dataset). Our networks can predict AAO-HNS value and achieve promising result by employing an ensemble of MLPs and other recent machine learning techniques such as drop-out and batch-normalization. The accuracy is greater than 74%. **결론:** With the inputs of clinical parameters, Machine learning algorithm could predict the clinical outcome of SSNHL.

OTTPP-51 14:50~14:54

### THE VALUE OF POSTERIOR SEMICIRCULAR CANAL FUNCTION IN PREDICTING HEARING RECOVERY OF SUDDEN SENSORINEURAL HEARING LOSS

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SENSORY ORGAN RESEARCH INSTITUTE, COLLEGE OF MEDICINE, DONGGUK UNIVERSITY

JUNG-WOO SHIN, SANG-WOO KIM, YOUN WOO

KIM, WOOK JANG, BO HAE KIM, YUN-SUNG LIM,  
SEOK-WON PARK, CHANG GUN CHO, JOO HYUN  
PARK

**목적:** Postulated etiologies for idiopathic sudden sensorineural hearing loss (SSNHL) include viral co-chleitis, microvascular events. If SSNHL is caused by vascular compromise of cochlear artery from common cochlear artery that supplies cochlea and posterior canal (PC), PC function also can be damaged with hearing. We aim to evaluate the prognostic value of PC function in relation to hearing recovery of SSNHL. **방법:** A total of 112 patients who were diagnosed and treated for SSNHL and who underwent video head impulse test (vHIT) and follow-ups for more than 3 months were reviewed retrospectively. We defined impairment of PC function as lower PC gain ( $< 0.7$ ) or definite overt/covert saccade in vHIT. Patients were divided into three groups: group 1, SSNHL with impaired PC function; group 2, SSNHL with dizziness, but intact PC function; group 3, SSNHL without dizziness. Hearing thresholds were repeatedly measured on the initial visit, 1 week, 1 month and 3 months after treatment. Treatment outcome was analyzed by comparing hearing recovery rate using Siegel's criteria and post-treatment audiometric changes among three groups. **결과:** Nineteen (16.1%), 60 (50.8%) and 33 (27.9%) patients were included into the group 1, 2 and 3, respectively. The hearing recovery rate of the group 1 (21%) was significantly lower than that of group 2 (50%) and 3 (60.6%) ( $p=0.020$ ). Pre- and post-treatment changes of the PTA threshold was significantly lower in group 1 than group 2 and group 3 ( $p=0.034$ ). The change of SD in each group were not different. **결론:** Our findings suggest that the presence of PC impairment may be a poor prognostic sign for hearing recovery in patients with SSNHL.

OTTPP-52 14:54~14:58

**EARLY-ONSET PROGRESSIVE HEARING LOSS IN HETEROZYGOUS CIRCLING (C57BL/6J-+/CIR) MICE**<sup>1</sup>DEPARTMENT OF MEDICAL GENETICS, COLLEGE OF MEDICINE, HALLYM UNIVERSITY, CHUNCHEON, KOREA,<sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, HALLYM UNIVERSITY, CHUNCHEON, KOREAYOO YEON KIM<sup>1</sup>, JUN GYO SUH<sup>1</sup>, JUN HO LEE<sup>2</sup>

**목적:** The circling mouse (C57BL/6J-cir/cir) is an animal model of deafness corresponding to human DFNB6. We hypothesized that the heterozygous circling mouse may be an animal model of accelerated ARHL. **방법:** At 2 and 4 months of age, C57BL/6J-+/+, C57BL/6J-+/cir, and C57BL/6J-cir/cir mice were used for the evaluation of hearing and cochlear morphology. ABR testing was performed to evaluate the auditory function. Cochlear hair bundles were observed using analytical high-resolution scanning electron microscope. The cDNA synthesis was performed from total RNA using the reverse transcription kit in accordance with the manufacturer's protocol. Gene expression levels were measured by real-time PCR. **결과:** In heterozygous circling (C57BL/6J-+/cir) mice, ABR thresholds were significantly elevated at 4 months of age compared to those at 2 months of age. Deafness at high frequencies (24 and 32 kHz) was detected in both C57BL/6J-+/+ and C57BL/6J-+/cir mice at 2 and 4 months of age. the expression of MYO7A in OHCs exhibited a tendency towards a decrease in C57BL/6J-cir/cir mice compared with that in C57BL/6J-+/+ and C57BL/6J-+/cir at 4 months of age. At 4-months of age. The relative density of SGNs was significantly reduced in C57BL/6J-+/cir mice compared to that in C57BL/6J-+/+ animals, while the density was also lower in C57BL/6J-cir/cir mice compared to

the density in C57BL/6J-+/cir mice at 4 months of age. the cochlear stereocilia was preserved in OHCs and IHCs, but a portion of the OHCs were lost in C57BL/6J-+/+ and C57BL/6J-+/cir mice. Cdh23 gene expression levels showed a statistically significant decrease in C57BL/6J-+/cir and C57BL/6J-cir/cir mice compared to those in the C57BL/6J-+/+ animals at 4 months of age. **결론:** Our data suggest that early-onset progressive hearing loss caused by lesions of SGNs occurs in C57BL/6J-+/cir mice at 4 months of age. Taken together, we propose that neural hearing loss develops in C57BL/6J-+/cir mice at an earlier stage than in the C57BL/6J-+/+ animals.

OTTPP-53 14:58~15:02

**KOREAN VERSION OF THE SENTENCE FIRST WORD IDENTIFICATION AND RECALL (K-SWIR) TEST**<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL,<sup>2</sup>SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINEMISEUNG KOO<sup>1</sup>, JIHUI JEON<sup>2</sup>, HWAYOUNG MOON<sup>2</sup>, MYUNG-WHAN SUH<sup>1</sup>, JUN HO LEE<sup>1</sup>, SEUNG-HA OH<sup>1</sup>, MOO KYUN PARK<sup>1</sup>

**목적:** In an attempt to estimate listening effort under ecologically valid listening conditions, the sentence final word identification and recall (SWIR) test has been developed and modified for use in several languages. We present the Korean version of this test (K-SWIR), with consideration of structural differences between this and other versions. We primarily validated the test material in normal-hearing listeners by assessing whether it shows significant correlations with reading span (RS) scores and the Korean version of the Montreal Cognitive Assessment (MoCA-K); then we analyzed the effects of noise on pupil response during the encoding process of heard sentences. **방**



**법:** In total, 14 seven-sentence lists from the Korean Hearing in Noise Test (KHINT) were selected for the K-SWIR. Sixty-five normal-hearing adults participated in 2 separate experiments after screening their hearing and conducting 2 cognitive tests. The next session began with a set of KHINT sentences and an identification task from the K-SWIR, resulting in 6 correctly repeated words. Pupil response was recorded during stimulus presentation, and listener recall performance was assessed under 3 conditions: quiet, stationary noise, and 4-talker babble. **결과:** Recall performance was significantly influenced by the presence of 4-talker babble ( $p < 0.05$ ), and the high-RS group recalled significantly better than did the low-RS group ( $p < 0.001$ ). Recall performance was positively correlated with RS scores and overall performances in noise were moderately correlated with RS scores. Significantly reduced peak pupil dilation and its latency evoked by the recall task were observed. **결론:** The K-SWIR test can be used to measure cognitive spare capacity in Korean speakers.

OTTPP-54 15:02~15:06

### ASSOCIATION OF SUDDEN SENSORINEURAL HEARING LOSS WITH INCREASED RISK OF INSOMNIA AND SLEEP DISORDER: A STUDY USING DATA FROM THE KOREA NATIONAL HEALTH INSURANCE SERVICE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, CHONBUK NATIONAL UNIVERSITY, JEONJU, KOREA

CHA-DONG YEO, EUN-JUNG LEE

**목적:** To evaluate the risk of insomnia and sleep disorder in Sudden Sensorineural Hearing Loss(SSNHL). **방법:** DESIGN, SETTING, AND PARTICIPANTS: A retrospective propensity score-matched cohort study was conducted using a nationwide representa-

tive sample from the National Sample Cohort 2002 through 2013 data from the Korea National Health Insurance Service. The SSNHL group ( $n = 601$ ) included certain patients who were diagnosed with SSNHL between January 2002 and December 2005. The comparison group was selected (4 Patients for every 1 patient with SSNHL;  $n = 2,404$ ) using propensity score matching, according to sociodemographic factors and the year of enrollment. Each patient was monitored until 2013. **MAIN OUTCOMES AND MEASURES:** Survival analysis, the log-rank test, and Cox proportional hazard regression models were used to calculate the incidence, survival rate, and hazard ratio (HR) of insomnia and sleep disorder for each group. **결과:** Among the 3005 individuals included in the study population (49.9% female), the overall incidence of insomnia and sleep disorder during the 8-year follow-up was 1.34-fold higher in the SSNHL group than in the non-SSNHL group (2.7 vs 3.0 per 100,000 person-year; adjusted HR 1.32; 95% CI, 1.00–1.75). Moreover, the adjusted HRs of developing insomnia and sleep disorder (depression, 3.08 [95% CI, 1.70–5.59]; anxiety, 2.08 [95% CI, 1.33–3.27]; tinnitus, 1.67 [95% CI, 1.33–2.10]) were greater in patients with comorbidities. **결론:** This observational study suggested that SSNHL is associated with an increased incidence of insomnia and sleep disorder. Specifically, findings from this study found that patients with tinnitus, depression and anxiety showed a higher risk of developing insomnia and sleep disorder than those without tinnitus, depression and anxiety.

OTTPP-55 15:06~15:10

### ASSOCIATION OF CHOCOLATE CONSUMPTION WITH HEARING LOSS AND TINNITUS IN MIDDLE-AGED PEOPLE BASED ON THE KOREAN NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY 2012-2013

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND  
NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL,  
SEOUL, KOREA

SANG-YEON LEE, MYUNG-WHAN SUH, JUN HO  
LEE, SEUNG-HA OH, MOO KYUN PARK

**목적:** Chocolate, which is produced from cocoa, exerts antioxidant and anti-inflammatory effects that ameliorate neurodegenerative diseases. We hypothesized that chocolate consumption would protect against hearing loss and tinnitus. We evaluated the hearing and tinnitus data, as well as the chocolate consumption, of middle-aged participants (40–64 years of age) in the 2012–2013 Korean National Health and Nutrition Examination Survey. **방법:** All of the subjects underwent a medical interview, physical examination, audiological evaluation, tinnitus questionnaire, and nutrition examination. A total of 3,575 subjects 40–64 years of age were enrolled. **결과:** The rate of any hearing loss (unilateral or bilateral) in the subjects who consumed chocolate (26.78% [338/1,262]) was significantly lower than that in those who did not (35.97% [832/2,313]) ( $P < 0.001$ ). Chocolate consumption was independently associated with low odds of any hearing loss (adjusted odds ratio = 0.83, 95% confidence interval = 0.70 to 0.98,  $P = 0.03$ ). Moreover, the severity of hearing loss was inversely correlated with the frequency of chocolate consumption. In contrast to chocolate, there was no association between hearing loss and the consumption of sweet products without cocoa. Also, chocolate consumption was not associated with tinnitus or tinnitus-related annoyance. **결론:** Our results suggest that a chocolate-based diet may protect against hearing loss in middle-aged people.

OTTPP-56 15:10~15:14

ANALYSIS OF MORTALITY RATES AND RELATED

## SURGICAL PROCEDURES IN PATIENTS WITH SEVERE-PROFOUND HEARING LOSS AND HEARING DISABILITIES IN SOUTH KOREA

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK  
SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE

HYEMIN HAN, HOYOUNG LEE, YOUNG-CHAN KIM,  
EUYHYUN PARK, JUNG HAK HYUN, GI JUNG IM

**목적:** The aim of this study was to estimate mortality rates, related rates of sudden hearing loss, and related otologic surgical procedures in patients with severe-profound hearing loss and hearing disabilities in South Korea. **방법:** Retrospective medical data for 160,205 patients with severe-profound hearing loss and hearing disabilities, were extracted from the Korean National Health Insurance Service (KNHIS) and National Disability Registry in the year of 2015. Patients' information was compared with a normal control group consisting of 865,475 people, which was 5 times the number of hearing disability patients. Mortality rates, related rates of sudden hearing loss, and related otologic surgical procedures were compared between whole patients with hearing disabilities and normal control population. **결과:** An estimation of 0.458% of the population suffer from severe-profound hearing loss above both 60 dB at 2015 in South Korea. Mortality rates increased to a maximum of 1.58 times the normal population as hearing function worsens, according to data concluded from analyzing registered hearing disability data in KNHIS. Higher rates of sudden idiopathic hearing loss were reported in patients with worse hearing functions. Prevalence of cholesteatoma was 2.7 times higher in the hearing disability patients compared to the normal population. Related otologic mastoidectomy surgery was 2.5 times more frequently performed in hearing disability patients. Cochlear implantation and PE tube insertion was about 15 times more frequently performed in the hearing loss patients than the normal population. **결론:** Patients with severe-profound hearing loss and

hearing disabilities have higher risks of mortality than normal control with normal hearing function, and are more likely to experience sudden idiopathic hearing loss and otologic surgical procedures.

**OTTPP-57 15:14~15:18**

## ROLE OF OBESITY IN OTORHINOLARYNGOLOGIC DISEASES

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** The purpose of this review was to discuss the relationship between obesity and otorhinolaryngological diseases. **방법:** This is a narrative review on the current state of incidence, effects, and associated mechanisms between obesity and otorhinolaryngologic diseases. **결과:** In various otologic diseases, otitis media (OM) and hearing loss (HL) are associated with obesity. In rhinologic parts, chronic rhinosinusitis (CRS) and obstructive sleep apnea (OSA) were significantly associated with obesity. Most of these diseases are reported to have higher susceptibility and severity as body mass index (BMI) increases. However, the incidence of head and neck cancer (HNC) was inversely associated with obesity, especially central adiposity. The relevance of obesity in laryngopharyngeal reflux disease (LPR) and allergic rhinitis (AR) has yet to be clarified, and this remains controversial. This review provides a comprehensive overview of the current state of incidence, effects, and associated mechanisms between obesity and otorhinolaryngologic diseases. Various otorhinolaryngological diseases are related to obesity. As obesity can be a negative risk factor in these otorhinolaryngologic diseases, early diagnosis and treatment of these diseases in obese patients will be critical. **결**

**론:** This review provides a comprehensive overview of the current state of incidence, effects, and associated mechanisms between obesity and otorhinolaryngologic diseases. Various otorhinolaryngological diseases are related to obesity. As obesity can be a negative risk factor in these otorhinolaryngologic diseases, early diagnosis and treatment of these diseases in obese patients will be critical.

**OTTPP-58 15:18~15:22**

## ASSOCIATION OF NUTRITIONAL FACTORS WITH HEARING LOSS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** This review of studies of nutrition and hearing has been conducted to investigate the types of nutrients, other than the well-known toxic substances, that play an important role in HL and to determine the mechanisms that affect HL. **방법:** This review of previous studies of nutrition and hearing was conducted to investigate the types of nutrient. **결과:** The review showed that (1) various nutritional factors (such as single nutrients (vitamin A, B, C, D and E, and zinc, Mg, Se, iodine, iron, fatty acid, carbohydrate, and protein) and the generalized nutritional status) are associated with hearing status; (2) the effect of each nutritional factor may depend on other factors (such as age or gender); and (3) various nutritional factors play roles in middle ear infection (such as otitis media) in pediatric subjects. **결론:** These studies indicate that various nutritional factors can affect hearing. Therefore, considering that multifactorial nutritional causes are responsible, in part, for HL, provision of proper guidelines for maintaining a proper nutritional status

is expected to prevent some of the causes and burden of HL.

**OTTPP-59 15:22~15:26**

**IS THE NEUTROPHIL-TO-LYMPHOCYTE RATIO A PREDICTIVE FACTOR IN PATIENTS WITH SUDDEN SENSORINEURAL HEARING LOSS?**

DEPARTMENT OF OTORHINOLARYNGOLOGY - HEAD AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE, KOREA UNIVERSITY ANSAN HOSPITAL, ANSAN, REPUBLIC OF KOREA

YOUNG-SOO CHANG, YOON CHAN RAH, JUNE CHOI

**목적:** Factors predictive of the severity of and recovery from sudden sensorineural hearing loss (SSNHL) remain unclear. Several individual studies have reported the association between the neutrophil-to-lymphocyte ratio (NLR) and SSNHL. However, the findings have been inconsistent, and these data have not been assessed adopting the NLR changing over time. This study aimed to elucidate the association between the calculated NLR and the test timing after the onset of hearing loss in patients with SSNHL. **방법:** A total of 253 patients aged over 19 years, who were treated with the diagnosis of SSNHL and visited our hospital without any medication from the local clinic, were included in the study. The complete blood cell count test was performed at their initial visit and calculated NLR. We calculated the hearing gain (hearing gain (dB) = (initial PTA) - (PTA one month after commencing treatment)) and the evaluation of audiological improvement according to the criteria of Siegel and further categorized as the recovery group and non-recovery group. The association between the calculated NLR and the time timing after onset, the severity of initial hearing loss, and the outcome of SSNHL were investigated. **결과:** One hundred and eleven patients were the recovery group, and one hundred and for-

ty-two patients were the non-recovery group. Age and initial blood test timing did not show any difference between the two groups. The mean NLR was 3.6 [1.8 - 6.9] in recovery group and 4.1 [2.0 - 7.6] in non-recovery group ( $p = 0.52$ ). In the recovery group, NLR presented a highest in fourth day blood sampling group, whereas NLR reaches a highest peak in second day blood sampling group in non-recovery group. Overall, there was no significant difference in NLR among different outcome groups when we were adopting the test timing following SSNHL. **결론:** The results indicate that clinical caution should be exercised when adopting NLR as a predictive factor in patients with SSNHL.

**OTTPP-60 15:26~15:30**

**THE RELATIONSHIP BETWEEN AGE-RELATED HEARING LOSS AND COGNITIVE DISORDER**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNG HEE UNIVERSITY

SUNG HWA DONG, MYUNG JIN PARK, JAE YONG BYUN, MOON SUH PARK, SANG HOON KIM, SEUNG GEUN YEO

**목적:** To investigate the association between presbycusis and cognitive disorder. **방법:** A retrospective review of patient medical records was conducted at a single tertiary university hospital. This study enrolled 399 patients aged  $\geq 65$  years who were prescribed hearing aids for the chief complaint of hearing loss. For main outcomes and measures we used audiograms, the Korean Mini-Mental State Examination, and the Global Deterioration Scale (GDS). **결과:** Of the 399 patients who were prescribed hearing aids for presbycusis, 45 (11.3%) had dementia and 354 (88.7%) did not have dementia. When the cognitive disorder group was divided into mild (1-4) and severe (5-7) subgroups

based on the GDS scores, the threshold of hearing loss was significantly higher in the severe group than in the mild group ( $p < 0.05$ ). The prevalence of dementia was significantly higher in patients with hearing loss for  $\geq 10$  years than in patients with hearing loss for  $< 10$  years ( $p < 0.05$ ). **결론:** Presbycusis and cognitive disorder are correlated. More severe and prolonged hearing loss is associated with a higher prevalence of cognitive disorder.

**OTTPP-61 15:30~15:34**
**MACHINE LEARNING APPROACH FOR PREDICTION OF HEARING PRESERVATION IN VESTIBULAR SCHWANNOMA SURGERY**

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

DONGCHUL CHA, SEUNG HO SHIN, GINA NA, SE A LEE, HO YOUNG LEE, GEUN CHEOL SHIN, IN SEOK MOON

**목적:** In vestibular schwannoma patients with functional hearing status, hearing preservation surgery can be considered. Since hearing preservation approaches are more complicated and are prone to incomplete tumor removal, proper patient selection is essential. Various kind of hearing test, tumor size, and origin of tumor have been known to be candidates of predictors on various studies. However, no predictive marker is determined yet. We used a machine learning approach to predict hearing outcomes in vestibular schwannoma patients who underwent hearing preservation surgery: middle cranial fossa, or retrosigmoid approach. **방법:** Medical records of 52 patients, of pathologically confirmed vestibular schwannoma, were reviewed. Hearing preservation was considered positive if the postoperative hearing was within serviceable hearing (50/50 rule) or the gap of pure tone average between preop and postop was less than 20 decibels. We included

approach (retrosigmoid or middle fossa approach) as a categorical variable and the following as the continuous variable: preoperative pure-tone average of 250, 500, 1K, 2K, 3K, and 4K Hertz, speech recognition threshold, word recognition score, most comfortable level, and the largest diameter of the tumor. Two learning methods were used for machine learning: SVM(support vector machine) and NN(neural network). **결과:** Data was trained and tested five times(5-fold cross-validation) to rule out selection bias. Prediction of hearing preservation or loss using SVM yielded an average of 56% accuracy. NN produced an average of 80% accuracy. **결론:** This is the first study to incorporate machine learning methodology into a prediction of hearing preservation surgery. Although more number of patients may be needed for better accuracy, this study could still aid the surgeons to decide whether to perform hearing preservation approach for vestibular schwannoma surgery.



## 제25차 이비인후과 종합학술대회 프로그램

10월 18일 금요일

Time	엑스포홀	그랜드홀1	그랜드홀2	세미나실1	세미나실2	세미나실3	세미나실4	세미나실5	세미나실6	세미나실7	엑스포홀 2층 로비	컨퍼런스홀 1층 로비	
0800-0900		대한후두음성인과의학회 Symposium & Panel discussion Recurrent respiratory papillomatosis	대한비과학회 Panel Discussion Septoturbinoplasty: what have we been doing for 100 years?	RHOP 8 부비동염 기초Ⅱ	HNOP 6 기관식도Ⅱ	RHOP 9 수면장애Ⅱ	HNOP 7 두경부갑상선/후두음성 기초 및 중개연구Ⅲ	TPP (두경부)	TPP (비과)		Video session	Poster 전시 이과 비과 두경부	
0900-1000				RHOP 10 알레르기 기초Ⅱ	HNOP 8 기관식도Ⅱ	RHOP 11 종양	HNOP 9 내시경로봇수술						
1000-1020	COFFEE BREAK												
1020-1120		대한기관식도과학회 Symposium Management of complication in bronchoesophageal surgery	대한인면성형재건학회 Panel discussion Challenges in rhinoplasty	RHOP 12 부비동염Ⅱ	HNOP 10 후두음성Ⅱ	Education Program 6 Wearables In Rhinolog	HNOP 11 구강인두타액선Ⅱ	Satellite symposium The Society for Head and Neck Oncology					
1120-1220				RHOP 13 비내시경 수술	Education Program 7 히말라야 트래킹	RHOP 14 알레르기	Education Program 8 Adobe Illustrator를 활용한 논문 Figure 정리 방법						
1220-1310	Lunch (웨딩홀 식당)	수련병원 과정학의	Lunch (웨딩홀 식당)										
1310-1410		대한이과학회 Panel discussion Minimizing cholesteatoma recidivism	대한강상선두경부외과학회 Panel discussion Salivary gland tumor	OTOP 8 청각치료 및 재활Ⅱ	HNOP 12 후두음성Ⅱ	OTOP 9 전정질환Ⅱ	Education Program 9 초보자를 위한 엔드노트 강의	의료법 및 의료강령의 주요개정					
1410-1510				OTOP 10 청각치료 및 재활Ⅱ	HNOP 13 후두/하인두	OTOP 11 전정질환Ⅱ	Education Program 10 알아 두면 평생 써먹는 수술 술기						
1510-1540		경품추첨	COFFEE BREAK										
1540-1640		OTOP 12 청신경계 및 청각학Ⅱ	HNOP 14 구강인두/타액선Ⅱ	OTOP 13 청신경계 및 청각학Ⅱ	HNOP 15 재건	OTOP 14 기타임상							

## 대한후두음성언어의학회 Symposium & Panel discussion

Recurrent respiratory papillomatosis

08:00~10:00 • 그랜드홀1

Chairperson(s) : 이병주(부산의대),

Moderator: 홍기환(전북의대)

08:00~08:15

### BASIC/EPIDEMIOLOGY

DEPT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, DIVISION OF TUMOR IMMUNOLOGY, CENTER FOR THYROID CANCER, CENTER FOR CANCER KNOWLEDGE & INFORMATION, NATIONAL CANCER CENTER

석준걸

#### 1. BASIC/EPIDEMIOLOGY

석준걸 (DEPT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, DIVISION OF TUMOR IMMUNOLOGY, CENTER FOR THYROID CANCER, CENTER FOR CANCER KNOWLEDGE & INFORMATION, NATIONAL CANCER CENTER)

#### 2. PREVENTION, VACCINATION/MEDICATION ADJUVANT RX. OF RECURRENT RESPIRATORY PAPILLOMATOSIS(RRP)

DONG KUN LEE (DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY DONG-A UNIVERSITY COLLEGE OF MEDICINE)

#### 3. SURGICAL MANAGEMENT OF RECURRENT RESPIRATORY PAPILLOMATOSIS

JAE-YOL LIM (DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE)

#### 4. AGGRESSIVE RRP: TRACHEOBRONCHIAL SPREAD & MALIGNANT TRANSFORMATION

WOO-JIN JEONG (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE)

#### 5. PANEL DISCUSSION

남순열(울산의대), 박영학(가톨릭의대), 정필상(단국의대), 손진호(경북의대), 손영익(성균관대의대), 진성민(성균관대의대), 김형태(예송이비인후과)

HPV is a DNA virus of the Papillomaviridae family with a propensity to infect epithelial cells. HPV 6 and 11 are responsible for more than 90% of RRP cases. Patients infected with HPV 11 develop more aggressive disease, which may lead to significant airway obstruction requiring frequent surgical procedures and adjuvant medical therapies, and sometimes even tracheostomy. Other subtypes, such as 16, 18, 31, and 33, are also associated with RRP, although with lower prevalence. HPV 16 and 18, comprising less than 1% of juvenile RRP, could have the potential for malignant transformation. RRP shows a characteristic bimodal distribution, affecting children and young adults. The juvenile form develops in patients less than 20 years of age. This form of the disease is generally aggressive, with multiple papillomatous lesions, and has a high recurrence rate. The adult form develops after 20 years of age, in the third and fourth decades of life, more commonly in men. They do not usually spread, and recur less. The estimated incidence of RRP is approximately 4 per 100,000 in children and 2 per 100,000 in adults. They are higher in groups with lower socioeconomic status. HPV infection in children occurs most often at birth, during passage through the birth canals of contaminated mothers. Transmission could also occur prior to birth, through the placenta, in about 12% of cases. The presence of maternal anogenital warts during pregnancy is considered to be a primary risk factor for juvenile-onset RRP. The presence of maternal anogenital papillomatous lesions during pregnancy, and particularly during birth, in-



creases the risk of RRP development by about 231 times. Approximately 0.7% of infants exposed to maternal anogenital warts develop the disease. In adults, HPV is transmitted sexually, through oral contact with infected external genitalia. Sexual activity with multiple partners stands out as a risk factor for HPV infection in adults.

08:15~08:30

### PREVENTION, VACCINATION/MEDICATION ADJUVANT RX. OF RECURRENT RESPIRATORY PAPILLOMATOSIS(RRP)

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY DONG-A UNIVERSITY COLLEGE OF MEDICINE  
DONG KUN LEE

In RRP, HPV-11 infection occurs most commonly and the disease presents an aggressive clinical course, followed by HPV-6. Rarely, RRP is caused by HPV types 16, 18, 31, and 33. Surgical excision of the RRP is the mainstay of treatment to ensure the functioning of airway and quality of phonation. Nonsurgical adjuvant treatment there have been several attempts to treat RRP medically. Unfortunately, despite some convincing theories, many treatments have proved to be ineffective, and in general medical treatment can only be considered as adjuvant to surgery. About 20% of RRP require adjunctive medical treatment in addition to surgery. Medication treatment act in immunomodulation and inhibition of HPV replication and proliferation. The current criteria for adjuvant therapy are ①  $\geq 4$  surgical procedures/year ② rapid recurrence with airway compromise ③ distal multisite spread. Medications used in such treatment include interferon, antiviral agents (acyclovir, ribavirin, cidofovir), retinoids, photodynamic therapy, bevacizumab, celecoxib, and HPV vaccine.

08:30~08:45

### SURGICAL MANAGEMENT OF RECURRENT RESPIRATORY PAPILLOMATOSIS

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE  
JAE-YOL LIM

Recurrent respiratory papillomatosis (RRP) is a chronic disease of the respiratory tract that occurs in both children and adults. It is caused by the human papillomavirus (HPV), in particular low-risk HPV6 and HPV11, and aggressiveness varies among patients. RRP remains a chronic disease that is difficult to manage. The current standard of care is surgical excision, with adjuvant therapies as needed. Objectives of surgery are to preserve adequate voice quality and airway patency. Complete eradication is not necessarily the goal, as HPV is believed to remain dormant in laryngeal epithelial cells whether active papilloma is visible or not. Extensive resection is contraindicated in the setting of disease involving the anterior or posterior commissure; these sites often require staged or sub-total removal of the papilloma. In patients with very aggressive disease, an additional goal is to prevent distal spread of papilloma to the lower respiratory tract. Tracheotomies are usually reserved for patients with aggressive disease that has the potential to occlude the airway, as studies have shown that a tracheostomy provides an additional site for rapid colonization and distal spread of RRP. Surgical instruments have evolved in the management of RRP from non-powered laryngeal instruments to lasers, and more recently to microdebridors. Different types of lasers and cold instruments can be used separately or in combination. The CO<sub>2</sub> laser's cutting ability, along with its ability to cauterize, have made it a popular tool. The photoangiolytic lasers precisely target hemoglobin within the microcirculation of the highly vascularized papillomatous tissue and may have better

hemostatic effects than the CO<sub>2</sub> laser. Photoangiolytic lasers have also shown better preservation of surrounding normal tissue. Photoangiolytic lasers can also be used in the office setting.

08:45~09:00

### AGGRESSIVE RRP: TRACHEOBRONCHIAL SPREAD & MALIGNANT TRANSFORMATION

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

WOO-JIN JEONG

Recurrent respiratory papillomatosis (RRP) per se is a rare disease caused by human papillomavirus. It has a predilection to be limited to the upper airway and larynx; however, lower airway involvement may occur in conjunction in 3–15% of the cases. In even more aggressive form of RRP, there have been multiple reports describing cases that had undergone malignant transformation. The aggressive form of the disease may require multiple sessions of laser laryngomicroscopy and bronchoscopy. In many instances airway patency may be at stake. Adjuvant therapy such as radiotherapy may also be necessary. Herein, we will discuss the clinical characteristics of the aggressive form of RRP and its management.

09:00~10:00

### PANEL DISCUSSION

남순열(울산의대), 박영학(가톨릭의대), 정필상(단국의대), 손진호(경북의대), 손영익(성균관대의대), 진성민(성균관대의대), 김형태(예송이비인후과)

## 대한비과학회 Panel discussion

Septoturbinoplasty: what have we been doing for 100 years?

08:00~10:00 • 그랜드홀2

Chairperson(s) and Moderator : 박동준(연세원주의대)

- 1. SURGICAL TECHNIQUES FOR CAUDAL OR HIGH SEPTAL DEVIATION**  
HYO YEOL KIM (SAMSUNG MEDICAL CENTER, SONGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE)
- 2. MANAGEMENT OF COMPLICATIONS AFTER SEPTOPLASTY**  
JUNG HO BAE (DEPARTMENT OF OTORHINOLARYNGOLOGY, EWH A UNIVERSITY COLLEGE OF MEDICINE)
- 3. INTRODUCING FOR DEVICES OF TURBINOPLASTY**  
SUNG JAE HEO (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KYUNGPOOK NATIONAL UNIVERSITY SCHOOL OF MEDICINE)
- 4. SEPTOTURBINOPLASTY IN PEDIATRICS : WHAT SHOULD BE DONE OR NOT**  
SOO WHAN KIM (DEPARTMENT OF OTORHINOLARYNGOLOGY, THE CATHOLIC UNIVERSITY OF KOREA)
- 5. REVISION SEPTOTURBINOPLASTY: WHEN, HOW, AND TIPS**  
TAE HOON KIM (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY KOREA UNIVERSITY COLLEGE OF MEDICINE)
- 6. VOTING SESSION: MY PREFERENCE IN SEPTORHINOPLASTY**

08:00~18:20

**SURGICAL TECHNIQUES FOR CAUDAL OR HIGH SEPTAL DEVIATION**

SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE

HYO YEOL KIM

08:20~08:40

**MANAGEMENT OF COMPLICATIONS AFTER SEPTOPLASTY**

DEPARTMENT OF OTORHINOLARYNGOLOGY, EWHA UNIVERSITY COLLEGE OF MEDICINE

JUNG HO BAE

The reported incidence of complications from septoplasty can range anywhere from 5% to 60%. Experience, meticulous surgical technique, and comprehensive preoperative planning are all necessary to limit complications. Additionally, the septoplasty surgeon must have a comprehensive understanding of the relevant anatomy, with a specific appreciation for high-risk areas. Complications after septoplasty can profoundly compromise a patient's functional and aesthetic outcome. The problems associated with septoplasty can lead the nasal airway to obstruct from a loss of support or as a result of the contractile forces of scarring. Incomplete resection, inadvertent nasal trauma, or even overcorrection of the septum may be at fault. It is therefore important for every nasal surgeon performing this procedure to be thorough and meticulous. A surgeon with a strong knowledge base and experience, quality surgical technique, and extensive planning can minimize these complications from occurring. Once complication occurred, adequate selection of repair techniques is mandatory for a successful treatment.

08:40~09:00

**INTRODUCING FOR DEVICES OF TURBINOPLASTY**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KYUNGPOOK NATIONAL UNIVERSITY SCHOOL OF MEDICINE

SUNG JAE HEO

Turbinoplasty is one of most commonly performed rhinologic surgery. Since turbinoplasty is relatively simple and takes a few minutes, it is often performed even in the outpatient clinic. Interestingly, although the procedure and technique of turbinoplasty are uncomplicated, surgeons use various methods. The technique of turbinoplasty consists of partial or total turbinectomy, submucosal inferior turbinate reduction, laser inferior turbinate reduction, inferior turbinate out-fracture, radiofrequency inferior turbinate reduction, cryotherapy, ultrasound-assisted reduction, and so on. These techniques are performed by using 15 blade, microdebrider, laser (CO<sub>2</sub>, diode, Ho:YAG, Nd:YAG, argon-ion, and potassium titanyl phosphate (KTP) laser), blunt instrument (Boise elevator or Freer elevator), monopolar or bipolar radiofrequency, and so on. I would like to introduce these instruments that used in turbinoplasty.

09:00~09:20

**SEPTOTURBINOPLASTY IN PEDIATRICS : WHAT SHOULD BE DONE OR NOT**

DEPARTMENT OF OTORHINOLARYNGOLOGY, THE CATHOLIC UNIVERSITY OF KOREA

SOO WHAN KIM

**OBJECTIVES:** Controversy has surrounded the procedure of pediatric septoplasty since the 1950s due to concerns over an adverse effect on nasal and facial growth. However, more recent evidence has demon-

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strated that septoplasty can be safely performed without affecting nasal and facial development in the appropriately selected pediatric patient. The purpose of this article is to establish the impact of pediatric septoplasty on nasal and facial growth and review the clinical indications and evidence for timing of surgery according to the most recent literature. METHODS: A structured review of the PubMed, Ovid Medline and Cochrane Collaboration databases (Cochrane Central Register of Controlled Trials, Cochrane Database of Systemic Reviews) was undertaken, using the terms: pediatric, childhood, septoplasty, nasal septum, indications, nasal growth and facial growth. RESULTS: Three long term follow up studies using anthropometric measurements were identified which concluded that pediatric septoplasty does not interfere with normal nasal or facial development. A further similar study concluded that external septoplasty does not affect most aspects of nasal and facial growth, but may negatively influence growth of the nasal dorsum. Furthermore, one study demonstrated that a group of children with symptomatic uncorrected deviated nasal septum had a statistically significant increased occurrence of facial and dental anomalies compared with age and sex matched controls, therefore supporting a role for septoplasty. CONCLUSIONS: Evidence exists to support that pediatric septoplasty can be performed without affecting most aspects of nasal and facial growth. Furthermore, not performing or delaying septoplasty when indicated may adversely affect nasal and facial growth with compounding adverse effects in terms of deformity and asymmetry. Despite the majority advocating the timing of septal surgery to be 6 years and older, more clinical studies are required that may provide further evidence for correction of septal deviations in younger children, perhaps even at birth.

09:20~09:40

### REVISION SEPTOTURBINOPLASTY: WHEN, HOW, AND TIPS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY KOREA UNIVERSITY COLLEGE OF MEDICINE

TAE HOON KIM

Septoplasty and turbino-plasty are all done to improve patients' complaints of nasal obstruction. Septoplasty for nasal obstruction is perhaps the most common of these procedures performed by otorhinolaryngologists in their adult patient population. It can be a complex procedure to do well, as evidenced by numerous contributions to the literature of different mechanisms to correct nasal obstruction brought about by a deviated septum. Efforts to improve the nasal obstruction by manipulating the septum began with Ingalls in 1882 and Freer and Killian in 1902 and 1904, respectively. Some of the most famous names in surgery and still others are credited with describing and improving septoplasty techniques. Despite advanced techniques that include closed, open, and endoscopic approaches, septoplasty is not always successful. A study reported that only 42% of septoplasty patients had a good to excellent result. A moderately successful result was found in 35%; a poor result in 23%. Another study recently published by Becker found that lack of improvement after primary septoplasty was often due to factors that affect the airway other than the septum, such as the nasal valve. The purpose of this presentation is to address the challenge of persistent nasal obstruction following septoplasty, specifically as it relates to revision septoplasty

09:40~10:00

### VOTING SESSION: MY PREFERENCE IN SEPTO-

## TURBINOPLASTY

## 대한기관식도과학회 Symposium

Management of complication in bronchoesophageal

10:20~12:20 • 그랜드홀1

Chairperson(s) : 김관민(서울의대), 김진평(경상의대)

### 1. POSTOPERATIVE ASPIRATION

YOUNG-HAK PARK (DEPARTMENT OF OTORHINOLARYNGOLOGY, SCHOOL OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA)

### 2. NON-SURGICAL MANAGEMENT OF TRACHEO-ESOPHAGEAL FISTULA

HO JOONG KIM (DEPARTMENT OF MEDICINE, DIVISION OF PULMONARY AND CRITICAL CARE MEDICINE, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER)

### 3. SURGICAL MANAGEMENT OF TRACHEO-ESOPHAGEAL FISTULA

JONG HO CHO (DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER)

### 4. ENDOSCOPIC VACUUM-ASSISTED CLOSURE THERAPY IN THE MANAGEMENT OF POSTOPERATIVE LEAKAGE AFTER ESOPHAGECTOMY

JAE HYUN JEON (DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY)

### 5. NONSURGICAL MANAGEMENT OF INTRACTABLE ESOPHAGEAL STENOSIS

HANG LAK LEE (DEPARTMENT OF INTERNAL MEDICINE, HANYANG UNIVERSITY HOSPITAL)

### 6. MANAGEMENT OF CHYLE LEAKAGE

HAN-SIN JEONG (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY,

SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, KOREA)

10:20~10:40

### POSTOPERATIVE ASPIRATION

DEPARTMENT OF OTORHINOLARYNGOLOGY, SCHOOL OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA  
YOUNG-HAK PARK

Aspiration is defined as any kind of food material entering the lower airway. Clinical symptoms that can cause aspiration may include poor swallowing, shortness of breath, repeated coughing, or pneumonia. Aspiration after bronchoesophageal surgery can be induced by oropharyngeal dysphagia due to intubation or tracheostomy, deterioration of general condition or vocal fold paralysis along with esophageal dysphagia due to tracheoesophageal fistula, stricture, and esophageal motor dysfunction. In order to effectively treat aspiration after surgery, it is necessary to understand the anatomical and physiological characteristics of swallowing on the basis of the patient's disease, and appropriate tests should be conducted to evaluate. Aspiration due to oropharyngeal dysphagia can be diagnosed through video fluoroscopic or endoscopic swallowing examination, and can be treated through posture change, sensory stimulation, dietary modification, and swallowing maneuvers. Additionally, swallowing muscle strengthening exercises and surgical treatment can be considered according to the patient's general conditions. Surgical treatments include vocal cord medialization, botulinum toxin injection to cricopharyngeal muscle, cricopharyngeal myotomy, laryngotracheal separation, and total laryngectomy. Esophageal dysphagia can be diagnosed through esophagoscopy, esophagography, manometry and im-

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pedence test. Treatment of esophageal dysphagia include medication, fistulectomy and closure, mechanical dilatation, botulinum toxin injection, and surgical treatment. The proper treatment should be chosen according to the exact cause of the esophageal dysphagia. During the treatment period, it is important to decide whether the patient should keep oral intake or tube feeding through nasogastric tube or percutaneous gastrointestinal tube should be done. The goal of such dietary ingestion is to protect the patient's airway and to provide nutrition and water safely.

10:40~11:00

#### NON-SURGICAL MANAGEMENT OF TRACHEO-ESOPHAGEAL FISTULA

DEPARTMENT OF MEDICINE, DIVISION OF PULMONARY AND CRITICAL CARE MEDICINE, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER  
HO JOONG KIM

Tracheo-esophageal fistula (TEF) is one of the disastrous result from the treatment in patients with esophageal cancer, lung cancer or sometimes benign tracheal diseases. It may cause repeated aspiration and dysphagia, thus results in poor quality of life. In selected patients with TEF, stenting had been tried to seal off the lumen, but the results were variable according to the patient characteristics and previous treatment, such as operation, radiation and chemotherapy. Although TEF can easily diagnosed by esophagography, bronchoscopy has a key role to decide stenting. Stenting can be applied when the size of the TEF is less than 2cm, and favorably less than 1cm. As double stenting (both tracheal and esophageal stenting) is necessary in most cases, good patient condition is essential. To avoid airway suffocation, tracheal stent should be inserted first, and esophageal stent next. In 20 years of experiences of Samsung

Medical Center, successful outcome was seen in 20% of cases. Favorable prognostic factors were small TEF, TEF on strictured trachea, good general condition and no history of radiation.

11:00~11:20

#### SURGICAL MANAGEMENT OF TRACHEO-ESOPHAGEAL FISTULA

DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SAMSUNG MEDICAL CENTER  
JONG HO CHO

Tracheo-esophageal fistula refers to abnormal communication between the trachea and the esophagus. Tracheoesophageal fistula (TEF) is a rare disease which develops as a result of congenital or acquired causes. However, due to the development of tracheal tube properties and management, the frequency of TEF developed after post intubation has been rarely found, and treatment related TEF caused by such as radiation treatment or surgery for lung cancer or esophageal disease is mainly observed. The management of TEF requires a multidisciplinary approach (thoracic surgery, oncology, gastroenterology, interventional pulmonology). Efforts aimed at treating the underlying cause should simultaneously be undertaken. Generally, the surgical approach for TEF depends upon the size of the fistula and the underlying cause. Although there are reports of endoscopic approaches to manage acquired TEF, open TEF repair or bypass remains the only definitive solution to this difficult problem. In patients with prior radiation, esophageal or pulmonary surgery, or in the redo setting, there is considerable risk of postoperative complications.

11:20~11:40

**ENDOSCOPIC VACUUM-ASSISTED CLOSURE THERAPY IN THE MANAGEMENT OF POSTOPERATIVE LEAKAGE AFTER ESOPHAGECTOMY**

DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY

JAE HYUN JEON

11:40~12:00

**NONSURGICAL MANAGEMENT OF INTRACTABLE ESOPHAGEAL STENOSIS**

DEPARTMENT OF INTERNAL MEDICINE, HANYANG UNIVERSITY HOSPITAL

HANG LAK LEE

Benign esophageal strictures are frequently seen in endoscopic practice. Most esophageal strictures can be treated by endoscopic dilation, but minority are found to be refractory or recurring after several dilation sessions. Benign esophageal strictures arise from a diversity of causes, for example esophagogastric reflux, esophageal resection, radiation therapy, ablative therapy, or the ingestion of a corrosive substance. Most strictures can be treated successfully with endoscopic dilation using bougies or balloons, with only a few complications. Nonetheless, approximately one third of patients develop recurrent symptoms after dilation within the first year. The majority of these patients are managed with repeat dilations, depending on their complexity. Dilation combined with intralesional steroid injections can be considered for peptic strictures, while incisional therapy has been demonstrated to be effective for Schatzki rings and anastomotic strictures. When these therapeutic options do not resolve the stenosis, stent placement should be considered. Self-bougienage can be proposed to a selected group

of patients with a proximal stenosis. As a final step surgery is an option, but even then the risk of stricture formation at the anastomotic site remains. Most clinicians nowadays follow a treatment algorithm using increasingly invasive treatment modalities for RBES. However, the evidence for such an algorithm is only limited and randomized trials are needed to determine the optimal order of treatments and the preferred treatment modality for different types of benign esophageal strictures. Several new developments are on the horizon, such as combined use of treatments, for example, a combination of incisional therapy and (progressive) dilation or the use of polyglycolic acid sheets for the prevention of post-ESD strictures.

12:00~12:20

**MANAGEMENT OF CHYLE LEAKAGE**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SONGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, KOREA

HAN-SIN JEONG

Chyle leak is an uncommon but serious sequela of head and neck surgery or esophageal surgery when the thoracic duct is inadvertently injured, particularly with the resection of malignancy low in the neck or around esophagus. When a chyle leak is identified during surgery, the thoracic duct may be ligated with surgical clips or oversewn with nonabsorbable suture. Additionally, locoregional flaps may be incorporated for additional coverage of the surgical bed. The clavicular head of the sternocleidomastoid can be dissected free and sutured to the wound bed. Although the anterior scalene flap has been described, it is infrequently used due to its small size and the risk of brachial plexus injury during flap harvest. Finally, a rotational pectoralis major flap can provide sufficient tissue bulk and cov-

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erage to reliably address a chyle leak. Additional topical agents can be applied to the wound bed at the time of surgery. Following surgery, management of a chyle leak depends on drain output, patient comorbidities, available institutional expertise, and surgeon preference. Chyle leaks may be broadly categorized as low output (<500 mL/day in neck surgery) or high output (>500 mL/day in neck surgery) based on drain output to assist with treatment decision making. In general, low output chyle leak can be treated effectively with conservative management, while high output fistulas will often respond unsatisfactorily to conservative management alone and require surgical intervention. With that said, drain output alone should not dictate treatment choices. Treatment effectiveness can often be gauged by how much drain output changes in response to particular interventions. In this presentation, various management strategies will be discussed including diet modification, wound care, somatostatin and octreotide, other topical agents, and thoracic duct embolization, thoracic duct ligation through surgical approaches.

## 대한안면성형재건학회 Panel discussion

### Challenges in rhinoplasty

10:20~12:20 • 그랜드홀2

Chairperson(s) : 김정수(경북의대),  
Moderator : 김영호(인하의대)

#### 1. CHALLENGES IN PRIMARY RHINOPALSTY

KUN HEE LEE (DEPARTMENT OF ORL-HNS,  
KYUNG HEE UNIV HOSPITAL AT GANGDONG)

#### 2. CHALLENGES IN THE REVISION RHINOPLASTY

YONG JU JANG (DEPARTMENT OF OTOLARYNGOLOGY,  
ASAN MEDICAL CENTER, UNIVERSITY  
OF ULSAN COLLEGE OF MEDICINE)

#### 3. THE CASES THAT CHANGED MY PRACTICE

JI YUN CHOI (CHOSUN UNIVERSITY COLLEGE OF  
MEDICINE)

#### 4. DIFFICULT PATIENTS OF RHINOPLASTY

HONG RYUL JIN (DR JINS PREMIUM NOSE CLINIC)

#### 5. VOTING SESSION: PRACTICES IN RHINOPLASTY

YOUNG HYU KIM (INHA UNIVERSITY HOSPITAL)

10:20~10:35

#### CHALLENGES IN PRIMARY RHINOPLASTY

DEPARTMENT OF ORL-HNS, KYUNG HEE UNIV HOSPITAL  
AT GANGDONG

KUN HEE LEE

Rhinoplasty is considered one of the most difficult surgical procedures among facial plastic surgery. Although its detailed technique is relatively easy there exists steep learning curve and patient-to-patient variation. Through step-by-step consultation you have to figure out what the patient really wants and whether it can be fixed or not. It is more important to set realistic expectation than surgical skills. In addition to appearance nasal function should be considered. Open rhinoplasty technique has been criticized that incision scar is noticeable. The scar is formed in not only transcolumellar incision but also lateral margin of columella which extended marginal incision from transcolumellar incision. In many cases patients don't be bothered by the scar but meticulous incision and careful suturing can avoid this problem. Although the choice of dorsal implants can be considered as surgeon's preference, it should be noted the characteristics, merits and demerits of each material. Many revision rhinoplasties are caused by the dissatisfaction in nasal dorsum related to the augmentation material. In nasal tip plasty the paradigm has been shifted from cutting of alar cartilage to the structural grafting method. In Asian nasal tip plasty structural graft-



ing is inevitable due to relatively weak alar cartilage, nasal septum and thick skin of nasal tip. The septal extension graft is very popular among surgeons and very versatile to control tip projection and rotation. It is divided into three types according to the shape of the graft cartilage and the location of the graft. 'First Do Not Harm' is also adapted to rhinoplasty. Nose is the most conspicuous part of the face and functionally important. Rhinoplastic surgeons should detect patients' problems and operate surgery as much as need, not simply showing off their skills. Keep learning from patients and humble to the patients are must-have attitude of rhinoplastic surgeons.

10:35~10:50

### CHALLENGES IN THE REVISION RHINOPLASTY

DEPARTMENT OF OTOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

YONG JU JANG

Revision rhinoplasty is the most challenging aspect in rhinoplasty. The surgeon has to deal with psychological frustration of the patient and surgeon him or herself. Money issue is also involved because the patients generally are not willing to pay due amount of money. While doing surgery, selection of approach and anesthesia, selection of graft or implant material matters a lot. When there is damaged skin soft tissue envelope, options for implant and technique is considerably limited. Furthermore, revision rhinoplasty carries higher risk of complications. Despite all the hurdle, rhinoplasty outcome should be satisfactory, not requiring any more revision. In this presentation, authors thoughts and experience on management of all the complicated issues related to the revision rhinoplasty will be discussed.

10:50~11:05

### THE CASES THAT CHANGED MY PRACTICE

CHOSUN UNIVERSITY COLLEGE OF MEDICINE

JI YUN CHOI

Revision rhinoplasty is a secondary procedure done to correct undesired results from an original rhinoplasty surgery. Many patients seeking revision rhinoplasty feel the results they received are too unnatural, not in harmony with their other facial features, or the results are not as pronounced as they desired. Many also suffer from new or under-corrected nasal obstruction after primary rhinoplasty. One of the biggest factors revision rhinoplasty surgeons must contend with is the amount of scarring stemming from the initial procedure. The more scar tissue there is, the longer and more difficult the procedure becomes. The surgeon will have to make carefully calculated incisions to have proper access to correct the nose while being careful to not create additional scarring. Scarring can alter the way the nose settles and heals after revision surgery in unpredictable ways if the revision rhinoplasty surgeon fails to create enough structural strength. Oftentimes the structure of the nose needs to be reinforced to maintain its shape after undergoing the initial rhinoplasty surgery. Using septal cartilage grafts is normally the best way to add strength to the structure of the nose. In revision cases, it is often depleted by the primary surgery. As such, revision rhinoplasty surgeons may have to use cartilage from the rib or ear. Since septal cartilage is the best first choice, it is preferred over ear or rib cartilage grafting. Ear cartilage is chosen if there is moderate weakness or if camouflage grafting is to be used. Ear is sometimes employed combined with skin when there is scarring or loss of internal lining, causing airway constriction or nostril retraction. These combined grafts, called "composite grafts", restore structure and lining simultaneously. Cartilage from the rib is necessary in severe cases

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where the nose is drastically deviated, scarred or otherwise weakened. Although some surgeons avoid rib grafting, fearing a result that is too large or stiff, most expert revision rhinoplasty surgeons have learned to sculpt the rib to take advantage of its strengths while also creating a natural look.

11:05~11:20

#### DIFFICULT PATIENTS OF RHINOPLASTY

DR JINS PREMIUM NOSE CLINIC

HONG RYUL JIN

Difficulties in rhinoplasty often come from technical difficulties in the surgery itself, the unexpectedness of wound healing, screening improper surgical candidates, and managing dissatisfied patients. Successful rhinoplasty often demands complex technical skills to fill the deficient dorsum, to normalize the structures that are congenitally abnormal or have been compromised by previous surgery, to reconstitute the missing skeletal tissues, and to restore soft tissue deficit. Among these, soft tissue deformity gives the surgeon more difficulties than anything else. The unpredictability of the wound healing, especially the skin-soft tissue envelope is another challenge that surgeons confront. Either genetic predisposition or severe tissue damage by previous surgery leads to unfavorable wound healing to injury. This sometimes leads to a complete surgical failure despite the successful restoration of the framework. Although the technical demands of difficult rhinoplasty patients are immense, exceptional technical skills alone are not sufficient for a successful practice. Real difficulties in rhinoplasty come from patient issues, especially proper screening, and dissatisfaction management. Rhinoplasty surgeon has able to look beyond the technical aspects of surgical treatment and to carefully examine and manage the emotional issues of the individual involved in the surgery. Dis-

cerning the improper candidates for rhinoplasty with a psychiatric disease such as somatoform disorders or various forms of aberrant personality disorders is not easy. Treating surgeons should be familiar with these psychiatric disorders that hinder successful treatment and be able to implement appropriate precautions and exclusions. Managing dissatisfied patients requires not only the skillset to fix the deformities but also patience and skills to manage the emotional upheaval involved with dissatisfaction. Rhinoplasty requires a long time of near-singular devotion to develop proficiency in these challenging, complicated issues.

11:20~12:20

#### VOTING SESSION: PRACTICES IN RHINOPLASTY

### Satellite symposium

Thai Society for Head and Neck Oncology

10:20~12:20 • 세미나실5

Moderator : Choakchai Metheetrairut, Pornake Apipan

#### 1. NEW THERAPEUTIC STRATEGIES FOR REGENERATION OF SALIVARY DYSFUNCTION

JEONG-SEOK CHOI (DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, INHA UNIVERSITY SCHOOL OF MEDICINE, INCHEON, REPUBLIC OF KOREA)

#### 2. PRINCIPLE OF SURGERY IN SALIVARY GLAND CANCER

KITTI JANTARAPATTANA (DEPARTMENT OF OTOLARYNGOLOGY, PRINCE OF SONGKLA UNIVERSITY, SONGKLA, THAILAND)

#### 3. EXTENDED APPLICATION OF ROBOTIC SUR-

**GERY FOR SALIVARY GLAND NEOPLASM**

고윤우 (연세의대)

**4. MANAGEMENT OF THE FACIAL NERVE IN PAROTID CANCER**

NAPADON TANGJATURONRASME (DEPARTMENT OF OTOLARYNGOLOGY, FACULTY OF MEDICINE, CHULALONGKORN UNIVERSITY, BANGKOK, THAILAND)

**10:20~10:40****NEW THERAPEUTIC STRATEGIES FOR REGENERATION OF SALIVARY DYSFUNCTION**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, INHA UNIVERSITY SCHOOL OF MEDICINE, INCHEON, REPUBLIC OF KOREA

JEONG-SEOK CHOI

Salivary glands produce saliva and saliva play an essential role in the homeostasis of the oral mucosa. It has effects on protecting the mouth, helping digestion and feeling the taste, killing bacteria, maintaining tooth integrity. Recently, the prevalence of salivary dysfunction is increasing due to aging and radiation exposure. Salivary dysfunction is caused by decreased salivary volume and changes in saliva components. If the oral mucosa becomes dry, the patient is gradually at risk of developing dysgeusia, dysphagia, dysarthria, oral ulcerations, dental caries, gingivitis, and bacterial and fungal infections. Those changes cause harmful effects to the oral homeostasis and decrease the quality of life of the patient. The therapeutic approach to salivary dysfunction is mainly dependent on residual gland function and focus on the alleviation of symptoms and correction of sequelae. Recently, many studies on salivary gland regeneration using tissue engineering have been conducted. This session will provide an understanding of the mechanisms of salivary gland dysfunction and information on tissue engineering re-

search through animal models of salivary gland dysfunction.

**10:40~11:00****PRINCIPLE OF SURGERY IN SALIVARY GLAND CANCER**

DEPARTMENT OF OTOLARYNGOLOGY, PRINCE OF SONGKLA UNIVERSITY, SONGKLA, THAILAND

KITTI JANTARAPATTANA

**11:00~11:20****EXTENDED APPLICATION OF ROBOTIC SURGERY FOR SALIVARY GLAND NEOPLASM**

연세의대

고윤우

**11:20~11:40****MANAGEMENT OF THE FACIAL NERVE IN PAROTID CANCER**

DEPARTMENT OF OTOLARYNGOLOGY, FACULTY OF MEDICINE, CHULALONGKORN UNIVERSITY, BANGKOK, THAILAND

NAPADON TANGJATURONRASME

**11:40~11:50****DISCUSSION**

## 대한이과학회 Panel discussion

Minimizing cholesteatoma recidivism

13:10~15:10 • 그랜드홀1

Chairperson(s) and Moderator : 정원호(성균관대의대)

### 1. CANAL WALL DOWN TYMPANOMASTOIDECTOMY

SHI NAE PARK (DEPARTMENT OF OTORHINOLARYNGOLOGY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA)

### 2. CANAL WALL UP TYMPANOMASTOIDECTOMY

HYUNG-JONG KIM (DEPARTMENT OF OTOLARYNGOLOGY, HALLYM UNIVERSITY COLLEGE OF MEDICINE)

### 3. ENDOSCOPIC SURGERY FOR CHOLESTEATOMA

HYONG-HO CHO (DEPARTMENT OF OTORHINOLARYNGOLOGY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL)

### 4. EUSTACHIAN TUBE SURGERY FOR CHOLESTEATOMA

SOOKEUN KONG (DEPARTMENT OF OTORHINOLARYNGOLOGY, PUSAN NATIONAL UNIVERSITY COLLEGE OF MEDICINE)

### 5. PANEL DISCUSSION

김형중(한림의대), 강명구(동아의대), 이준호(서울의대), 박시내(가톨릭의대), 조형호(전남의대), 공수근(부산의대)

13:10~15:25

### CANAL WALL DOWN TYMPANOMASTOIDECTOMY

DEPARTMENT OF OTORHINOLARYNGOLOGY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

SHI NAE PARK

Mastoidectomy for chronic otitis media with or without cholesteatoma has primary objectives – obtaining a disease-free ear, prevention of recurrent disease, achieving best possible option for reconstruction of the affected hearing mechanism, and overall improvement of quality of life. Performing a canal wall down (CWD) mastoidectomy seems to be a good option in treating advanced chronic otitis media or cholesteatoma since it offers excellent exposure for disease eradication and post-operative control of residual disease. Disadvantages of CWD mastoidectomy include chronic recurrent otorrhea, granulation tissue formation and accumulation of debris in the exteriorized mastoid cavity usually requiring regular otological maintenance and cleaning. A mastoidectomized cavity may also harbor fungal or bacterial infection and may cause dizziness brought about by temperature or pressure changes. However, CWD tympanomastoidectomy is still the most reliable surgical procedure for chronic otitis media with cholesteatoma considering its valuable role in preventing residual or recurrent cholesteatoma. Mastoid obliteration has been well known technique to reduce cavity problems following CWD mastoidectomy. Mastoidoplasty, which is an alternative procedure that aims to totally eliminate the cavity problems caused by CWD mastoidectomy, may even provide an avenue for further hearing rehabilitation with canal type hearing aids. Recent indication and application of CWD tympanomastoidectomy will be reviewed with the literatures in this lecture. A new practical concept of mastoidoplasty with CWD tympanomastoidectomy will be also introduced with the detailed surgical skill. The results of CWD tympanomastoidectomy and the final hearing rehabilitation after matoidoplasty will be discussed based on our data.

13:25~13:37

### CANAL WALL UP TYMPANOMASTOIDECTOMY

DEPARTMENT OF OTOLARYNGOLOGY, HALLYM UNIVERSITY  
COLLEGE OF MEDICINE

HYUNG-JONG KIM

중이 진주종은 수술적 치료 후 흔히 재발성(residual or recurrent) 병변을 보이는 질환으로 알려져 있다. 이 질환의 수술적 접근법은 크게 canal wall up mastoidectomy와 canal wall down mastoidectomy로 분류하지만, 낮은 병기의 선천성 중이 진주종에서는 exploratory tympanotomy 만으로도 수술할 수 있고, 진행된 중이 진주종에서는 subtotal petrosectomy를 시행하는 등 병변의 진행 범위에 따라 적절한 술기를 사용하며 최근에는 내시경을 이용하여 술후 residual 병변의 재발율을 낮추려는 시도도 있다. Canal wall down mastoidectomy는 술후 필연적으로 개방성 공동을 형성하여 각 질촉적 제거 또는 공동 감염의 치료를 위해 드레싱 진료가 요구되는 문제점이 있고, Canal wall up mastoidectomy는 이러한 술후 개방성 공동의 문제점은 없지만, 수술 시야가 좋지 않고, 진주종의 제거가 불완전하여 residual 병변 재발율이 높은 문제점이 있다. Canal wall down mastoidectomy와 함께 피판이나 지방, 조직 적합물질을 이용한 mastoid obliteration을 시행하여 위의 문제점을 해결하려는 시도가 있었지만, tissue atrophy나 이물질감염의 위험을 내포하고 있어 해결법으로서 완벽하지는 않다. 본 연구에서는 술후 진주종 재발을 최소화하고, 술후 개방공동문제도 해결하기 위하여 canal wall up mastoidectomy와 함께 섬유근육피판을 이용한 mastoid obliteration을 시행한 경험을 소개하고, 그 결과를 함께 공유하고자 하였다.

13:37~13:49

### ENDOSCOPIC SURGERY FOR CHOLESTEATOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY, CHONNAM  
NATIONAL UNIVERSITY MEDICAL SCHOOL

HYONG-HO CHO

In treating attic cholesteatoma, traditional microscopic approach provides limited exposure to the attic space.

Endoscopic instrumentation, techniques, and knowledge have improved over the last few years, and I believe that, in the future, endoscopic surgical techniques will gain increasing importance in otologic surgery. Endoscopic ear surgery can be considered an effective method to eradicate attic cholesteatoma. It provides better visualization of hidden areas and a better chance at tissue preservation. Minimally invasive access allows for a better understanding of the pathophysiology of cholesteatoma. Results can be compared with those reported for classic microscopic techniques in terms of recurrences or residual pathology at long-term follow-up. Further experiences, and even longer follow-up are necessary to confirm its efficacy.

13:49~14:01

### EUSTACHIAN TUBE SURGERY FOR CHOLESTEATOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY, PUSAN  
NATIONAL UNIVERSITY COLLEGE OF MEDICINE

SOOKEUN KONG

이관개구부전 (Eustachian tube dilatory dysfunction) 은 중이 진주종 발생에 원인인자로 잘 알려져 있다. 이관개구부전의 원인은 bony Eustachian tube의 mechanical obstruction과 cartilaginous ET의 폐쇄 (isthmus 포함)를 고려해 볼 수 있다. 이관개구부전 뿐만 아니라 이관개방증(patulous Eustachian tube)에서도 진주종이 발생할 수 있는 데, 이는 이관개방증 환자의 sniffing habit 과 관련되어 있다. 이런 경우의 진주종의 대개 attic cholesteatoma 형태로 주로 발생되지만 진행되면 광범위하게 발전될 수도 있다. 따라서 cholesteatoma 환자에서 술 전에 이관 기능을 평가해서 환자의 이관개구부전 혹은 이관 개방증과 sniffing habit의 동반 유무를 파악 해야 할 것이다. 진주종환자에서 이관기능문제가 동반되어 있다면 이관기능문제를 수술 시 함께 해결해 준다면 술 후 진주종의 재발율을 낮추는 데 도움이 될 것이다. 본 연제에서는 진주종의 술 후 재발율을 줄

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이기 위해 진주종에 동반된 이 관개구부전과 이관개방  
증의 치료에 대해 논의 하고자 한다.

14:01~15:10

**PANEL DISCUSSION**

김형중(한림의대), 강명구(동아의대), 이준호(서울의대),  
박시내(가톨릭의대), 조형호(전남의대), 공수근(부산의대)

**대한갑상선두경부외과학회  
Panel discussion**

Salivary gland tumor

13:10~15:10 • 그랜드홀2

Chairperson(s) : 봉정표(연세원주의대),  
Moderator : 정한신(성균관의대), 김철호(아주의대)

13:10~15:10

**PANEL DISCUSSION**

조광재(가톨릭의대), 우정수(고려의대), 박일석(한림의대),  
박정제(경상의대)

## Education Program VI

10:20~11:20 • 세미나실3  
Chairperson(s) : 조석현(한양의대)

10:20~11:20

### WEARABLES IN RHINOLOG

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL  
NATIONAL UNIVERSITY COLLEGE OF MEDICINE, BUNDANG  
HOSPITAL

JEONG-WHUN KIM

Wearable 장비들의 활용 범위는 일상 생활속에서 뿐만 아니라 의료영역에서 도 점차 확대되어가고 있다. 만성 질환인 당뇨 모니터링을 위한 콘택트 렌즈 등이 대표적인 예가 될 수 있으나 아직 의료영역에서의 활용은 활발하지는 못하다. 하지만, 각종 앱을 구동할 수 있고, 다양한 센서들을 내장하고 있는 모바일폰의 보급이 급격히 확대되어 대부분의 사람들이 거의 하루 종일 휴대 하고 있으며, Fitbit 웨어러블, 애플 Watch, 삼성 갤럭시 active 등의 손목 시계형 웨어러블의 시장이 크게 확대됨에 따라서 의료용 웨어러블의 의료적 이용도 빠르게 늘어날 것으로 전망된다. 웨어러블의 대표적인 장비는 무엇보다도 모바일폰 그 자체라 할 것이다. 모바일폰은 자체적으로 매우 다양한 센서와 장치들을 내장하고 있다. 예를 들어 갤럭시 s10에는 가속도 센서, 기압 센서, 지문 센서, 자이로 센서, 지자기 센서, 홀 센서, RGB 광 센서, 근접 센서, 심박수 측정 센서, 마이크, 이미지 센서 등이 내장되어 있어 이들 센서를 활용하는 각종 app의 개발에 의해서 활용도는 매우 넓어질 수 있다고 할 것이다. 이비인후과 영역에서는 수면관련 분야가 웨어러블 활용이 가장 활발하다. 수면호흡장애를 진단하기 위한 웨어러블 장비뿐만 아니라, 코골이를 측정하기 위한 매우 많은 app들이 이미 일반인들에 의해서 이용되고 있다. 최근 애플은 수면의 질 측정용 디바이

스개발 스타트업을 인수하기도 하였다. 수면호흡장애가 비만 및 라이프스타일과 매우 관련성이 높기 때문에 activity tracker형태의 각종 웨어러블을 비만도 감소 및 운동 증진을 위해 서 활용하려는 다양한 시도가 있어왔다. 그 외의 영역으로는 알레르기 비염 의 약물 복용과 삶의 질 평가를 위한 앱개발과 이를 이용한 임상시험이 차츰 활발하게 진행되고 있다. 안면성형 관련하여 환자의 얼굴을 정확하게 진단하기 위한 앱도 개발되어 시험을 하는 것으로 보고되고 있다. 의료영역은 많은 규제가 엄격하게 적용되어 기술의 파급이 쉽지 않은 것으로 알려져 있지만, 웨어러블을 중심으로 한 각종 IT 기술이 이비인후과 영역에서도 점차 그 활용도가 넓어져 의료의 질 향상과 건강 향상에 기여할 것으로 기대된다.

## Education Program VII

11:20~12:20 • 세미나실2  
Chairperson(s) : 이진춘(부산의대)

11:20~12:20

### 히말라야 트레킹

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND  
NECK SURGERY, YONSEI UNIVERSITY WONJU COLLEGE OF  
MEDICINE

JEONG-PYO BONG

트레킹(trekking)이란 남아프리카 원주민들이 달구지를 타고 정처없이 집단 이주한 데서 유래하였고, 전문적인 등산 기술이나 지식 없이도 즐길 수 있는 산길을 걷는 것으로, 전문 산악인들이 개발한 네팔의 히말라야 등 험한 산악 길이 일반에게 공개되면서 트레킹이라는 용어로 정착되었다. 정상 정복이 목표인 등정, 등산과는 다른 개념으로 정상을 오르려 하지않고 산길을 따라

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오래 걸으면서 가슴으로 자연과 여행의 감동을 느끼는 것이다. 세계 곳곳에 수 많은 트레킹 코스가 개발되어 있고 엄청난 많은 사람들이 트레킹을 즐기지만 그 중에 가장 인기있고 한 번쯤은 경험해보고 싶은 것이 세계의 지붕이라 불리는 히말라야를 걷는 트레킹이다. 히말라야 트레킹은 보통 5,000m이하의 지역에서, 하루 12~15 km정도 걸으며, 고도 적응을 위해서 600m이상 고도를 높이지 않으면서 산행이 이루어진다. 몇 일씩 걸어야 하는데 따른 체력 안배와 고산에서 갑자기 고도를 올림으로서 오는 신체변화에 적응하기 위해서다. 여러 히말라야 트레킹 코스 중 푼힐전망대 트레킹, 안나푸르나 베이스캠프 트레킹, 에베레스트 베이스캠프 트레킹 등이 가장 많이 알려진 코스이다.

## Education Program VIII

11:20~12:20 • 세미나실4  
Chairperson(s) : 정용기(성균관의대)

11:20~12:20

### ADOBE ILLUSTRATOR를 활용한 논문 'FIGURE' 정리 방법

YONSEI UNIVCOLLEGE OF MEDICINE, MEDICAL RESEARCH  
SUPPORT SERVICES

DONG SU JANG

많은 연구자들이 SCI논문을 우편으로 투고했던 2000년도까지는 Figure 이미지의 해상도는 크게 문제되지 않았다. 현재 대부분의 연구자들이 이미지를 제작 및 편집하기 위하여 사용하는 대표적인 툴(Tool)은 “Power Point”이다. 하지만 각 저널마다 논문의 질을 향상시키고 이를 통한 저널의 경쟁력을 제고하기 위한 일환으로 ‘Journals artwork guideline’을 구체적으로 명시하기 시작하였으며 이로 인하여 논문에 포함된

Figure의 해상도를 향상시키는 것이 논문 투고에 있어서 중요한 요소가 되었다. 고해상도의 이미지를 편집하는 데에 있어서 가장 활용도가 높은 대표적인 프로그램은 “Adobe Illustrator”이다. 현재 Adobe Illustrator 프로그램을 연구자들이 폭넓게 쓰고 있지 않기 때문에 Power Point를 활용하여 공동연구자들과 본문 Figure 내용을 협의하며 Storyboard를 정리하는 것이 좋다. 본문 Figure 중 통계데이터(SPSS, R, 기타)의 경우, 사진 이미지(Bitmap image)가 아닌 고해상도 이미지로 작업할 수 있는 벡터 이미지(Vector Image)로 추출 및 전환하는 것이 중요하다. 사진 이미지의 경우, Adobe Photoshop에서 사진 보정을 거친 후 Figure들을 Adobe Illustrator에 있는Artboard에 슬라이드 형식으로 넣을 수 있다. 이러한 방식은 Figure 내용에 따라 저널 양식에 맞춰 폭과 높이를 마음대로 설정할 수 있다는 장점이 있다. Adobe Illustrator의 장점은 편집 작업의 대부분을 vector이미지로 저장할 수 있으며 포맷 유형 역시 연구자가 원하는 대로 출력(Tiff, eps, jpg, 기타)할 수 있다는 것이다. 특히, Combination Figures의 경우, Adobe Illustrator 프로그램 중 ‘Align Tool’ 기능을 통하여 짧은 시간 안에 효과적으로 정리할 수 있어서 이에 대한 활용도가 매우 높다. 뿐만 아니라 MS-Office(word, Power Point, Excel) 프로그램들을 모두 vector로 전환한 후, Adobe Illustrator 프로그램에서 불러올 수 있다는 점도 큰 장점이다. 연구자들이 많이 사용하는 의학통계프로그램인 ‘SPSS’, ‘R’ 역시 출력 파일에서 데이터를 eps(vector) 파일로 가져올 수 있기 때문에 저널에서 요구하는 해상도(300 or 600dpi)를 구현하는 데에 유용하다. Adobe Illustrator는 더이상 디자인 전문가들의 전유물이 아니며, 연구자들이 기본적인 기능을 습득한다면 양질의 Figure를 손쉽게 생산 및 편집할 수 있을 것이며 논문의 전반적인 질을 향상시킬 수 있을 것이다.



## Education Program IX

13:10~14:10 • 세미나실4  
Chairperson(s) : 박계훈(순천향의대)

## Education Program X

14:10~15:10 • 세미나실4  
Chairperson(s) : 김한수(이화의대)

13:10~14:10

### 초보자를 위한 엔드노트 강의

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL  
JAE-JIN SONG

Endnote는 논문의 reference 관리를 위해 Clarivate Analytics사에서 제작되어 배급되고 있는 프로그램으로, 가장 널리 사용되고 있는 프로그램이다. 이 프로그램은 매우 다양한 기능을 보유하고 있으나, 그 중 필수적인 기능만 숙지하고 있어도 논문의 작성, reference의 정리 등에 있어 크게 도움이 된다. 본 강의에서는 이러한 Endnote의 기능 중 가장 기초적인 기능을 중심으로 소개할 예정이며, 실제 reference를 찾아 논문을 관리하는 기능들을 현장에서 시연을 통해 익히 보고자 한다. 주로 전공의 및 전임의 선생님들을 대상으로 강의를 진행하고자 하며, 각자 본인의 노트북에 Endnote 프로그램을 받아와서 실제 사용법을 따라하는 형식의 강의를 진행하고자 하니 청중께서는 본인의 노트북을 직접 준비해 오기를 부탁드립니다.

14:10~15:10

### 알아 두면 평생 써먹는 수술 술기

DEPARTMENT OF OTOLARYNGOLOGY HEAD AND NECK SURGERY, KOSIN UNIVERSITY COLLEGE OF MEDICINE  
HYOUNG SHIN LEE

기본 수술 술기 (Basic surgical skill)는 외과 영역에 해당하는 이비인후과 의사로서 반드시 갖추어야 할, 말 그대로 기본에 해당한다. 본 강의에서는 이비인후과 전공의로서 알아야 할, 달리 표현하면 이비인후과 전문의가 되기 위해 알아야 할 기본 수술 술기에 대해 정리해 보고자 한다. 더불어 두경부외과 수술 (Head and neck surgery)을 집도하고 보조하는데 필요한 주요 술기에 대해서도 다루고자 한다. 수술칼을 다루는 법, 피부 절개를 하는 법, 봉합사의 종류와 다양한 봉합법 (suture technique), 혈관 결찰술 (tie technique), 배액관 삽입과 고정법, 단극성 소작기를 이용한 조직 절개 및 절단법, 조직 절단과 지혈을 위한 에너지 기기 (energy device)의 사용법 및 주의 사항 등에 대해 동영상 위주로 강의하고자 한다. 이 강의를 통해, 수술 보조를 시작하는 전공의, 수술 집도를 시작하는 전공의 및 펠로우 선생님들이 안전하고 효과적인 수술을 하는데 도움을 얻기를 바란다.

18일 (금)

본과 및 유관 학회 프로그램

Education Program

이과 구연 (OTOP)

비과 구연 (RHOP)

두경부 구연 (HNOP)

TPP

## OTOP 8

청각치료 및 재활 II

13:10~14:10 • 세미나실1

Chairperson(s) : 신시옥(충북의대), 여승근(경희의대)

### OTOP-43 13:10~13:20

#### EFFECT OF DIURETICS FOR TREATMENT OF ACUTE LOW-TONE HEARING LOSS: SYSTEMATIC REVIEW AND META-ANALYSIS

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY, BORAMAE MEDICAL CENTER  
HYUNKYUNG CHA, DONG-HAN LEE, DOH YOUNG LEE, YOUNG HO KIM

**목적:** Acute low-tone hearing loss (ALHL) has been treated with lack of evidence-based information. We compared outcomes of hearing improvement between two different treatments -steroid and diuretics alone- in patients with ALHL through systematic review and meta-analysis of available literature. **방법:** Two investigators independently searched Pubmed, Embase, Cochrane databases for studies reporting hearing improvement outcomes of ALHL after treatment. Articles including recovery rate after treatment of steroid and diuretics alone were selected. Pooled odds ratio (OR) was calculated by using a random-effects model meta-analysis. **결과:** After retrieving data from 412 potentially relevant articles, 4 retrospective cohort studies involving a total of 1,249 individuals were identified. Among them, steroid alone treatment was applied to 269 patients while 246 patients were treated with diuretics alone. After each treatment, 358 low-tone hearing levels completely recovered. Recovery rates of diuretics and steroid treatment group were 73.6% (181/246) and 65.8% (177/269), respectively.

Diuretics only treatment group showed significantly high recovery rate compared to that of steroid only treatment group (odds ratio 1.58, 95% confidence interval 1.06–2.36,  $P = 0.024$ ). **결론:** The current study suggests that primary trial of diuretics may be beneficial before the application of steroid therapy.

### OTOP-44 13:20~13:30

#### DELAYED SPONTANEOUS RECOVERY IN IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS

DEPARTMENT OF OTORHINOLARYNGOLOGY, ILSAN PAIK HOSPITAL, INJE UNIVERSITY COLLEGE OF MEDICINE, GOYANG, KOREA  
YONG SEOK JO, TAEK YOON CHEONG, JIMIN YUN, JEON MI LEE

**목적:** This study aimed to investigate the delayed spontaneous recovery rate in sudden hearing loss, and to discover the factors which cause delayed spontaneous recovery. **방법:** We assessed a total of 660 patients with sudden hearing loss who visited the clinic between March 2017 and July 2019. Inclusion criteria was 1) patients who terminated their treatment for any reasons, and 2) patients who underwent hearing evaluation at least 2 months after treatment termination. Patients with recurrent hearing loss, bilateral hearing loss, Meniere's disease, and/or vestibular schwannoma were excluded. If there was more than 5dB of hearing gain after treatment termination, it was classified as delayed spontaneous recovery. Age, days to first steroid administration, initial and post treatment hearing levels, treatment durations, combined symptoms and underlying diseases (DM, HTN, and autoimmune disease) were assessed, and compared. **결과:** A total of 72 patients were enrolled in the study. Among 72 patients, 24 showed delayed spontaneous recovery (33.3%). There were no significant differences be-

tween two groups in variables but treatment durations ( $30.0 \pm 18.9$  days vs.  $24.7 \pm 11.7$  days,  $p < 0.05$ ). **결론:** Delayed spontaneous recovery in idiopathic sudden hearing loss was found in 33% of affected population. Patients who received steroid therapy for longer time tended to show delayed spontaneous recovery. This study could provide evidence for long-term use of steroid when immediate hearing recovery is not apparent.

#### OTOP-45 13:30~13:40

### APPLICATION OF FOUR TYPES OF THE TRANSCRANIAL ELECTRIC STIMULATIONS FOR TINNITUS

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY, EUL-JI MEDICAL CENTER, EULJI UNIVERSITY, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

EUN BIT BAE<sup>1,2</sup>

**목적:** While several transcranial electric stimulations have been actively used for the research of tinnitus treatment, the effectiveness and following clinical mechanism have not been proven yet. We performed this study to understand how the strength of the electric current and the frequency of current clinically affect in the human brain. **방법:** We obtained data from total 18 tinnitus subjects and four types of stimulation were done in the same subjects; 1.5mA transcranial direct current stimulation (tDCS), 2.0mA tDCS, low frequency of transcranial random noise stimulation (LF-tRNS), high frequency of tRNS (HF-tRNS). For objectively measuring the effects, we used 32 ch of EEG and THI, VAS score of tinnitus intensity, distress, QoL and perception were used for subjective measurement. **결과:** Within a group comparison in 2.0mA of tDCS, p-values were under 0.01 in VAS tinnitus distress, intensity, and QoL. In the 1.5mA of tDCS group, VAS intensity, distress and perception

were significantly decreased ( $p < 0.05$ ). In LF-tRNS only intensity was significant ( $p = 0.025$ ) and nothing was significant in HF-tRNS. The 2mA of tDCS was highest effective at decreasing both central and bilateral temporal area in averaged value of topography, although the results of the 1.5mA of tDCS showed statistically significant in the same areas in beta3 and gamma of high frequency which was decreased and showed significantly increased activity in delta and theta (Wilcoxon signed rank test). After LF-tRNS, beta 3 frequency was significantly increased in the right of BA45 ( $p = 0.047$ ). HF-tRNS also showed an increasing tendency in the gamma band on the left of BA44 ( $p = 0.088$ ) and BA45 ( $p = 0.076$ ). Asymmetry of the right and left neural activity was highly increased after both LF and HF tRNS especially highest at post-HF-tRNS while 2.0mA tDCS makes decrease right and left asymmetry. **결론:** tDCS decreases the high frequency and increase delta, and it is possibly related to decreasing tinnitus symptom, and while tRNS increase brain asymmetry.

#### OTOP-46 13:40~13:50

### ASSESSMENT OF THE EFFECTS AND SURGICAL RESULTS OF STAPEDOTOMY ON HEARING AND TINNITUS: COMPARISON OF FIBEROPTIC CO<sub>2</sub> LASER VERSUS CONVENTIONAL METHOD

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY- HEAD & NECK SURGERY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY- HEAD & NECK SURGERY, YEOUIDO ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

JUNG MEE PARK<sup>1</sup>, JAE SANG HAN<sup>1</sup>, JACLYN LEIGH VIDAL<sup>1</sup>, JAE HYUN SEO<sup>1</sup>, SO YOUNG PARK<sup>2</sup>, SHI NAE PARK<sup>1</sup>

**목적:** Though various successful results of stapedot-

omy using multiple LASER systems have been reported worldwide, only a few case studies have been reported from Korea. This study aimed to investigate hearing and tinnitus changes following stapedotomy by comparing the use of fiberoptic CO<sub>2</sub> LASER and conventional techniques for fenestration. **방법:** The clinical data of 63 primary stapedotomy procedures performed by one surgeon in Seoul St. Mary's Hospital were reviewed. Enrolled cases included 33 ears of stapedotomy using conventional skitter drill technique (conventional group) and 30 ears using a fiber-type CO<sub>2</sub> LASER system (LASER group). Postoperative 1-month and 6-month hearing outcomes, as well as the changes in tinnitus symptoms, were compared with initial levels. Development of intraoperative and postoperative complications was investigated as well. **결과:** In total, average air-bone conduction gap significantly improved in both groups postoperatively, with a significantly better outcome of LASER group than the conventional group at postoperative 1-month ( $P<0.05$ ). Improved tinnitus symptom scores were observed at 1-month postoperatively, which were sustained at postoperative 6 months in both groups. Postoperative tinnitus occurred less frequently in the LASER group ( $P<0.05$ ). Serious intraoperative complications occurred more in the conventional group compared to the LASER group. LASER group showed a shorter operation time and a shorter hospital stay ( $P<0.05$ ), probably due to lesser intraoperative and immediate postoperative complications. **결론:** Both conventional and fiber-type CO<sub>2</sub> LASER stapedotomies showed good hearing outcomes, along with improved tinnitus symptom scores. LASER stapedotomy seemed to provide more stable fenestration of stapes footplate, resulting in fewer complications and better postoperative results, including tinnitus, compared to the conventional method.

OTOP-47 13:50~14:00

## THE PREVALENCE AND CAUSES OF LIMITED AND NON-USE IN COCHLEAR IMPLANT

DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY, SCHOOL OF MEDICINE

JONG SEI KIM, HYE JIN WHANG, MIN BUN KIM, YOUNG SANG CHO, IL JOON MOON, YANG-SUN CHO, WON-HO CHUNG

**목적:** Cochlear implant(CI) surgery is a treatment that ensure successful hearing rehabilitation in patients with profound hearing loss. But there is a need for an analysis of relevant factors for those who do not use cochlear implant after surgery. The purpose of this study was to assess the prevalence and causes of limited and non-use in cochlear implant. **방법:** We conducted a telephone survey of 317 patients who underwent cochlear implant surgery in our institute from 2002 to 2017. The telephone questionnaire included whether to use a CI, satisfaction score, use time during the day, and the reasons for dissatisfaction. Medical records were also reviewed to analyze clinical problems related to the use of CI. **결과:** Two hundred patients responded to the telephone survey. Average satisfaction score was  $8.4 \pm 1.9$  out of 10 in all patients using CI and  $4.2 \pm 3.1$  in limited users who utilize CI less than 6 hours per day. Ten (5.1%) patients were non-users and 5 (2.5%) were limited users. Non-users did not use CI on average  $7.8 \pm 2.6$  years after surgery. In young age group under 18 years old, 3 of 168 (1.8%) patients were non-users and 4 (2.4%) patients were limited users. Limited users used  $3.2 \pm 1.7$  hours on average. In adult group over 18 years old, 7 of 32 (19.4%) patients were non-users, and no limited users. The reasons for limiting CI use were include the headache caused by noisy sound when using cochlear implant, poor hearing outcome, pain when they wearing outer device, difficulty in managing device

properly, and the burden of ongoing costs for device management. Especially in young age group, the proportion of underlying diseases such as cerebral palsy was higher than adult group. **결론:** Patients should be evaluated before surgery whether they will continue to use cochlear implant. In addition to medical issues related to outcome, the problem related to practical use that lower satisfaction should be considered carefully.

#### OTOP-48 14:00~14:10

### SELF-ESTEEM IN HEARING IMPAIRED INDIVIDUALS AFTER COCHLEAR IMPLANTATION

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, KOREA

YEHREE KIM, JEE YEON LEE, EUN JUNG HWANG, WOO SEOK KANG, JOONG HO AHN, HONG JU PARK, JONG WOO CHUNG

**목적:** Self-esteem means an emotional attitude toward oneself and one's own competencies. Hearing impaired (HI) individuals may report lower levels of self-esteem, due to the multiple challenges they face with their lower language and communication skills. Cochlear implants (CIs) can enhance their speech outcomes which in turn may elevated their self-esteem also. The aim of this study was to evaluate CI recipients' self-esteem and to investigate the factors that influence its scores. **방법:** We asked CI recipients who came to our clinic for mapping and follow up to complete the Rosenberg Self-Esteem Scale (RSES). RSES consists of 10 statements to which the subject responds on a four-grade scale from 1 to 4. The overall score is a total of all the points and the higher the score, the higher the global self-esteem. We retrieved 71 answers from 63 patients. **결과:** Thirty-six females and 27 males aged  $23.1 \pm 9.3$  years were included. The average score of RSES for the whole group was 30.2

$\pm 4.6$ . There were no differences in global self-esteem scores according to sex ( $p=0.29$ ) or mode of deafness onset (prelingual/postlingual) ( $p=0.42$ ). We found no correlation between RSES and age or the length of CI use. We found statistically significant correlation between the patients speech perception abilities and self-esteem ( $\rho=0.267$ ,  $p=0.02$ ). **결론:** There is high variability in levels of self-esteem among CI recipients. Clinicians should be aware of the levels of self-esteem in order to help patients reach their full potential.

## OTOP 9

전정질환 I

13:10~14:10 • 세미나실3

Chairperson(s) : 한규철(가천의대), 안중호(울산의대)

#### OTOP-49 13:10~13:20

### DEVELOPING A DYNAMIC VIRTUAL REALITY MODEL FOR VISUALIZATION OF INNER EAR FLUID MECHANICS

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>LABORATORY OF BRAIN & COGNITIVE SCIENCES FOR CONVERGENCE MEDICINE, HALLYM UNIVERSITY

SUNG KWANG HONG<sup>1,2</sup>, HANJAE JEON<sup>2</sup>, JYAE HYOUNG YU<sup>2</sup>, MINHUI AHN<sup>2</sup>, HYUNG-JONG KIM<sup>1,2</sup>

**목적:** The main aim of this study is to develop a dynamic virtual reality model and interface for practical understanding of inner ear fluid mechanics according to head movement. **방법:** We adapted the torsion pendulum model of the single semicircular model to generate an endolymphatic fluid flow. Cupula volume displacement was regarded as same as that of endo-

lymph volume displacement, in which inertial force was transformed to Laplace domain to calculate the transfer function defined as cupula volume displacement and real angular head velocity. Although otolith organ should be responsible for sensing a linear acceleration, we did not include the transfer function of otoconial layer displacement according to linear movement due to methodologic limitation. Visual model of semicircular model was developed using Unity program based on real anatomical data and subsequently simulated with virtual inner ear fluid based on the transfer function. Extra-ocular muscle movement was linked with excitation and inhibition of involved semicircular canal. **결과:** Our simulation model presented on virtual reality revealed a possibility of experimental platform for inner ear mechanics, wherein user could see an inner ear fluid dynamics as head movement. In addition, this model would be used for better understanding of BPPV for education. **결론:** We successfully developed the dynamic virtual model and user-friendly interface allows the participants to observe what theoretically is going on at the level of each semicircular model as head movement. Further refinement will focus on integration of otolithic dynamic function into the current simulation model.

**OTOP-50 13:20~13:30**

### GENETIC ETIOLOGY AND CLINICAL CHARACTERISTICS OF HEREDITARY DIZZINESS WITH SENSORINEURAL HEARING LOSS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

SE A LEE, JINA NA, DONG CHUL CHA, JINSEI JUNG, JAE YOUNG CHOI, SUNG HUH KIM

**목적:** To investigate the cause and clinical characteris-

tics of patients presented with hereditary simultaneous dizziness symptoms with sensorineural hearing loss.

**방법:** We enrolled the patients with dizziness and sensorineural hearing loss from the registry of hereditary sensorineural hearing loss in Yonsei University. Onset of hearing loss and dizziness, results of genetic study, presence of autoimmune disorder, audiogram patterns, and the results of vestibular function tests of those patients were analyzed. **결과:** Among 1045 patients in the registry, 90 patients (8.6%) had dizziness symptoms simultaneously. The mean age of the patients was  $42.1 \pm 17.5$  years old, male to female ratio was 36 : 54, and disease duration was  $17.1 \pm 12.1$  years. Thirty patients (30%) had recurrent vertigo attacks and the others had recurrent mild dizziness or chronic dizziness. NGS and other genetic studies were performed in 90 patients, and the mutation was found only in 12 patients. The mean onset of dizziness symptoms was mostly after the onset of hearing loss. The mean age of onset of hearing loss and dizziness was  $25.2 \pm 17.6$  years and  $31.3 \pm 16.2$  years. The pattern of hearing change was fluctuating in 14, progressive in 62, and stable in 14 patients. Most patients had moderate to severe and profound hearing loss. 21 patients showed abnormal vestibular function test. The pattern of hearing loss, hearing level, and shape of audiogram were not related to the phenotype of dizziness and the results of vestibular function tests. **결론:** According to our data, genetic mutation for hearing loss with dizziness is identified only in the small number of patients. The onset age of dizziness in those patients is later than hearing loss, long term follow-up is mandatory for identifying their balance problems. Future studies to identify the causative novel genes for hearing loss with dizziness should be performed and this will elucidate the shared cellular physiology between cochlear and vestibular systems.

**OTOP-51 13:30~13:40****EFFICACY OF ADDITIONAL CANALITH REPOSITIONING PROCEDURE IN PATIENTS WITH POSITIONAL DIZZINESS AFTER SUCCESSFUL TREATMENT IN POSTERIOR CANAL BENIGN PAROXYMAL POSITIONAL VERTIGO: A DOUBLE-BLIND RCT**

DEPARTMENT OF OTORHINOLARYNGOLOGY, HANYANG UNIVERSITY COLLEGE OF MEDICINE, MYONGI HOSPITAL, DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE

DAE BO SHIM<sup>1</sup>, TAE HOON KONG<sup>2</sup>, JIN WOOK KANG<sup>1</sup>, SANG KWON IM<sup>1</sup>, MEE HYUN SONG<sup>1</sup>

**목적:** The aim of this study is to identify the rate of PC-BPPV patients with remained post-CRP positional dizziness and to assess the therapeutic efficacy of additional CRP on the remained positional dizziness comparing with observation. **방법:** This is a prospective, double-blind, randomized study that included 158 consecutive patients with PC-BPPV. All patients included in the study received a single CRP daily until the positional nystagmus and vertigo disappeared. Patients were randomly assigned after resolution of PC-BPPV as follows: Group 1, an additional CRP performed and Group 2, observation only. To compare degree of positional dizziness, visual analogue scale (VAS) and dizziness handicap inventory (DHI) scores were compared between two groups at each point of immediately following treatment, 1 week and 1 month after the treatment. Independent t-test for continuous variables, and Chi-square or Fisher's exact tests for categorical variables were performed. The repeated measures ANOVA and linear mixed model were used to analyze the treatment effect of additional CRP. **결과:** Eighty-four patients (53.2%) out of total 157 patients experienced positional dizziness after complete resolution of PC-BPPV, and one in 84 patients was lost to follow-up. Of 83 patients,

41 patients were group 1, and 42 patients were group 2. There was no statistically difference between the two groups in the time required to positional dizziness improvement ( $6.9 \pm 4.76$  days and  $6.8 \pm 6.03$  days, respectively.) There were also no statistical differences in VAS ( $p=0.814$ ) and DHI ( $p=0.972$ ) scores between two groups at all evaluation points, ( $p=0.898$  for VAS,  $p=0.533$  for DHI). **결론:** About 53% of patients were confirmed to experience positional dizziness, after the completely disappearance of positional vertigo and nystagmus following CRP in patients with PC-BPPV. However, additional CRP did not have any particular effect on post-CRP positional dizziness even in the analysis through RCT.

**OTOP-52 13:40~13:50****CORRELATION BETWEEN THE SUBJECTIVE SYMPTOM AND AMPLITUDE OF POSITIONAL NYSTAGMUS IN LATERALIZATION OF HC-BPPV**

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**목적:** The aim of this study is to assess the correlation between subjective symptom and amplitude of positional nystagmus in diagnosis and lateralization of horizontal canal benign paroxysmal positional vertigo (HC-BPPV). **방법:** This study is a prospective study. A total of 108 consecutive patients diagnosed with HC-BPPV from January 2018 to May 2019 were enrolled. HC-BPPV was determined according to the AAO-HNS guidelines. The lateralization of HC-BPPV (determination of affected sides) was established for geotropic HC-BPPV [HC-BPPV(Geo)],

where amplitude of nystagmus is strong during supine roll test (SRT); and for apogeotropic HC-BPPV [HC-BPPV(Apo)], amplitude of nystagmus is weak. In addition, only patients who matched the direction of lesions diagnosed in SRT were analyzed in this study when bow and leaf tests were performed, in order to complement the lateralization of HC-BPPV. All subjects were performed videonystagmography (VNG) during therapeutic maneuver to assess the direction and the amplitude of nystagmus. They also answered how much they feel dizziness during the VNG as the visual analogue scale (VAS). Chi-square test for categorical variables and correlation analysis were performed for statistical analysis. **결과:** Among 108 patients, 56 were HC-BPPV(Geo) and 52 were HC-BPPV(Apo). The lateralization of HC-BPPV determined by maximal slow phase velocity (SPV) was completely consistent with that determined by VAS. As the maximal SPV was increased, the VAS also showed an increase ( $R=0.504$ ,  $p<0.001$ ). There was also positive correlation between the difference of maximal SPV and the difference of VAS from both sides ( $R=0.324$ ,  $p<0.001$ ). **결론:** The lateralization of HC-BPPV evaluated by the maximum SPV and VAS respectively was perfectly matched. In addition, the amplitude of nystagmus and the VAS score had a statistically significant correlation. Therefore, the extent of subjective symptoms may help determine the direction of the lesion when clinicians diagnose HC-BPPV patients using SRT.

**OTOP-53 13:50~14:00**
**THE CLINICAL USEFULNESS OF CATCH-UP SACCAD IN VIDEO HEAD IMPULSE TEST (vHIT) OF PATIENTS WITH MENIERE'S DISEASE (MD)**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CATHOLIC KWANDONG UNIVERSITY, INTERNATIONAL ST MARYS HOSPITAL, INCHEON, KOREA

SOYEON YOON<sup>1</sup>, GUN HYUK LEE<sup>2</sup>, MI JOO KIM<sup>3</sup>, MINBUM KIM<sup>4</sup>

**목적:** The purpose of this study is to investigate the results of video head impulse test (vHIT) in patients with Meniere's disease (MD). **방법:** A total of 23 consecutive patients satisfied with "definite" and "probable MD" criteria, which is recently formulated by the Classification Committee of the Bárány Society, were included. They were categorized into "paralytic" and "irritative" group by the direction of nystagmus, and were also "definite" and "probable" group. We analyzed VOR gains and the occurrence of catch-up saccade (CUS) in the respective groups. For comparisons, caloric paresis (CP) was also analyzed in the bithermal caloric test. **결과:** In the "probable MD" group, positive CUS was observed in 7 out of 10 patients (70%). In contrast, abnormal CP was only in 2 patients ( $p=0.024$ ). There was no significant interaural difference in the VOR gains of three axis. In the "paralytic MD" group, positive CUS was observed in 5 out of 7 patients. However, abnormal CP was only in 1 patients ( $p=0.030$ ). There was no significant interaural difference in the VOR gains of three axis. **결론:** In the early stage of MD, CUS in vHIT might be a more sensitive and objective tool to detect vestibular dysfunction than gains in vHIT or CP in caloric test. We also assume that CUS could be less compensated than CP, and remained abnormal for longer period.

**OTOP-54 14:00~14:10**
**DEVELOPMENT OF AN ARTIFICIAL INTELLIGENCE METHOD FOR AUTOMATIC MEASUREMENT OF HYDROPS RATIO ON INNER EAR MR IMAGES FOR MENIERE'S DISEASE**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE,



SEOUL, KOREA

YOUNG SANG CHO<sup>1</sup>, KYEONG WON CHO<sup>2,3</sup>, CHAE JUNG PARK<sup>2</sup>, YI-KYUNG KIM<sup>4</sup>, HYUNG-JIN KIM<sup>4</sup>, BAEK HWAN CHO<sup>2,3</sup>, WON-HO CHUNG<sup>1</sup>

**목적:** We have previously demonstrated the usefulness of inner ear MRI for the diagnosis and evaluation of Ménière's disease. Furthermore, we found that artificial intelligence using deep learning can read MRI results efficiently. As a final step of the study, a new method was applied to increase the accuracy of the reading, and verification was completed using internal validation. **방법:** The 3T inner ear MRI scans were used after intravenous injection of single-dose Gado-diamide for evaluation and quantification of hydrops. MR cisternography (MRC) and HYDROPS images of 119 patients who were diagnosed with MD were under investigation. A part of dataset has only annotations on the organ of interest of each representative slice, which we call as selectively annotated dataset (SA), and the other part of dataset has annotations on both organs, which we call as fully annotated dataset (FA). Finally, internal validation of the data of 40 new patients was completed. **결과:** We performed experiments of training models on FA (110 cases), SA (262 cases) and both of datasets (FASA, 372 cases) separately, and applied transfer learning based on the best model. The neural network models (modified VGG 19) were used for the segmentation of the organs. Among the three FA / SA / FASA, SA was the best and segmentation and correlation were the best when fine-tuning with SA. As a result of internal validation with 40 new MRI image dataset, excellent correlation of 97.4% was obtained. **결론:** Segmentation of cochlea and vestibules in MRC images and the calculation of hydrops ratio from the AI-predicted area showed promising performance. This study demonstrates that the inner ear MR image analysis using deep learning is possible and accurate as human experts.

## OTOP 10

청각치료 및 재활 III

14:10~15:10 • 세미나실1

Chairperson(s) : 조양선(성균관의대), 송재준(고려의대)

OTOP-55 14:10~14:20

### CORRELATES OF ELECTRICAL FIELD INTERACTIONS WITH ELECTRICAL AUDITORY BRAINSTEM RESPONSES IN PEDIATRIC COCHLEAR IMPLANTEES

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL, KOREA

SANG-YEON LEE, SUN A HAN, MYUNG-WHAN SUH, MOO KYUN PARK, JUN HO LEE, SEUNG-HA OH

**목적:** Although electrical Auditory Brainstem Responses (eABR) via the cochlear implant has been implicated in predicting CI outcomes, the prognostic role of eABR is still elusive. The majority of current cochlear stimulators generate biphasic current pulses (BP) consisting of two opposing polarities that follow each other in time. We hypothesized that wider and interactive BP between electrodes may capture a more spiral ganglion neuron (SGN), thereby provides more significant information regarding SGN integrity. Here, we compared the eABR parameters according to BP modality (classic vs. interactive) in the pediatric cochlear implantees. Also, we sought to validate differential electrical field interactions depending on BP modality via 3D cochlear modeling. **방법:** In this study, 19 pediatric implantees were enrolled and eABR recordings were made directly after cochlear implant insertion. Two separate systems were employed; one for recording and one for stimulation. The

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eABR findings were analyzed as a point of reference to the latency, amplitude, and presence of wave V. 3D cochlear modeling was complimented by multimodal imaging-based detailed anatomical model of the human head and neck. **결과:** Either shorter latency or higher amplitude of wave V were found in interactive BP than classic BP, especially in the cochlear basal region. Also, a significantly higher presence rate of wave V was observed in interactive BP than classic BP. In 3D cochlear modeling, interactive BP exerts more intense electromagnetic energy and more widespread activation compared with classic BP. Moreover, interactive BP encompassed significantly higher SGN population than classic BP. **결론:** Taken together, eABR using interactive BP, characterized by intensive and widespread stimulation in the cochlear, is likely to elicit a robust neural activation. Our results may provide new perspectives on the treatment strategy based on eABR via a wider and interactive protocol, especially in subjects with cochlear nerve deficiency.

#### OTOP-56 14:20~14:30

##### PARADOX OF AURAL PREFERENCE SYNDROME

DEPARTMENT OF OTOLARYNGOLOGY, COLLEGE OF MEDICINE, DONG-A UNIVERSITY

SUNG WOOK JEONG

**목적:** To examine whether there was the evidence of aural preference syndrome in congenitally deafened children who received sequential bilateral cochlear implantation (biCI) in our hospital, and if any, to reveal its impact on speech perception. **방법:** Twelve congenitally deafened children who received sequential biCI were included. Inclusion criteria were first CI before age 3 years, normal cochlea and cochlear nerve, and absence of additional handicaps. Mean ages at first CI and second CI were 1.9 years and 9.0 years, respectively. P1 CAEP was recorded from both

ears at the day when second implant was switched on. The P1 latencies and speech perception scores of both ears were analysed. **결과:** P1 of first CI ear was recorded from all the subjects and that of second CI ear was recorded from 8 children. P1 latency of first CI ear decreased as CI use duration increased ( $r=-0.77$ ,  $p<0.05$ ). P1 latency of second CI ear also was shorter as first CI use duration was longer ( $r=-0.71$ ,  $p<0.05$ ). P1 latency of second CI ear was positively correlated with that of first CI ear ( $r=0.83$ ,  $p<0.05$ ). Speech perception score of second CI ear of 8 children who had present P1 response was comparable to that of first CI ear at 6 months after second CI. The four children who had absent P1 response of second CI ear showed worse speech perception at 6 months after second CI, but eventually caught up the first CI ear, and three of them showed present P1 response 6 months after switch-on. **결론:** Early unilateral CI before age 3 years may develop bilateral auditory cortices to the similar degree as shown by comparable latencies of P1 CAEP elicited from both ears. Abnormal aural preference of auditory cortices toward hearing ear in children with unilateral CI affects badly to audition. Paradoxically, thanks to the abnormal aural preference, auditory cortex contralateral to non-implanted ear is well-matured and well-prepared to receive second CI, so even late second CI results in excellent speech perception.

#### OTOP-57 14:30~14:40

##### THE NECESSITY AND CURRENT STATUS OF NON-SURGICAL BONE CONDUCTION HEARING AIDS IN PEDIATRICS WITH UNILATERAL CONGENITAL AURAL ATRESIA

DEPARTMENT OF OTORHINOLARYNGOLOGY - HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

SANG-YOON HAN, JAE-JIN SONG, JA-WON KOO,

BYUNG YOON CHOI

**목적:** 편측성 외이도 폐쇄증은 75/100000의 유병률을 보이는 질환으로, 환측의 심한 전음성 난청을 동반한다. 이는 언어 습득, 발음, 조음, 주의력에 문제를 유발하는데, 환측이 우측일 때 문제가 더 두드러진다. 이에 수술 전 비수술적 골도보청기 착용이 권고되며, 최근엔 1세 이하부터 권유되고 있다. 그러나 일부 환자들은 기적응 문제, 경제적 문제 등으로 사용하지 않는다. 이에 본 연구에서는 편측성 외이도 폐쇄증 환자에서 골도보청기 사용 현황을 살펴보고자 한다. **방법:** 13세 이하의 편측성 외이도 폐쇄증 환자 중 비수술적 골도보청기를 대여한 34명 (남:여 21:13; 평균연령  $22.2 \pm 28.3$ 개월)을 대상으로 병력, 골도청력, 보청기 종류, 구매 여부, 비구매 사유에 대하여 조사를 시행하였다. 골도보청기 대여는 무료로 진행되었고, 사용 전 골도보청기의 필요성을 설명하였다. **결과:** 환측은 우측 85%(29명), 좌측 15%(15명)로 우측이 많았다. 이들 중 골도보청기 구매가 76%(26명), 구매 거부 15%(5명), 대여 중으로 결정 못한 경우가 9%(3명)이었다. 환자들 중 반대측에 난청이 있는 3명은 모두 구매하였다. 연령은 골도보청기 구매 군이  $18.5 \pm 17.5$ 개월, 거부 군이  $43.6 \pm 60.2$ 개월로 구매 군이 어렸으나, 유의하지 않았다. ( $p=0.41$ ) 골도청력은 환측  $31.0 \pm 12.8$ dB(최고 50dB), 반대측  $25.7 \pm 20.1$ 이었고 환측의 82%(27명)가 정상범위였다. 환측/반대측의 골도청력은 구매 군  $28.7 \pm 17.0/25.0 \pm 22.4$ dB, 비구매 군  $25.0 \pm 5.0/20.0 \pm 6.1$ dB로 두 군간 유의한 차이는 없었다. ( $p=0.47/0.49$ ). 이외 구매여부와 착용 방향, 성별에 대해 연관성을 분석했으나 유의하지 않았다. 기기의 종류는 BAHA 24명, Adhear 10명이었고 BAHA에서 20%, Adhear에서 25%가량이 대여 후 구매하지 않았으며 이 차이는 유의하지 않았다. ( $p=1.00$ ) 비구매 원인으로는 BAHA는 착용불편감이 67%로 가장 많았으며, Adhear는 기기부착 문제가 가장 컸다. 이외 가격문제, 효과 없음이 1명씩 있었다. **결론:** 편측성 외이도 폐쇄증 영유아 환자들은 대개 환측의 정상 골도청력을 가지고 있어 양이청 회복 대상이 될 수 있다. 이들은 부모와 충분한 상담 후, softband BAHA를 시험 착용한 환자의 80%, Adhear를 시험 착용한 환자의 75%가 착용 및 구매를 한다. 따라서 골도

청력이 정상인 편측성 외이도 폐쇄증 영유아 환아에 대해 양이청 회복을 위한 비수술적 골도보청기 권유에 보다 적극적인 필요가 있다.

OTOP-58 14:40~14:50

### SAFETY AND EARLY SPEECH PERCEPTION ABILITY BY EARLY COCHLEAR IMPLANT SWITCH-ON

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MIN YOUNG KWAK, JEE YEON LEE, YEHREE KIM, JIN TAEK PARK, WOO SEOK KANG, JOONG HO AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** To investigate the safety and early speech perception ability by early switch-on after cochlear implant (CI). **방법:** 101 ears which received CI in a tertiary referral center between 2014 and 2019 were enrolled retrospectively. Initial activation occurred 3.20 days (range 1 to 8 days) after surgery. We evaluated medical complications associated with early fitting. Word recognition scores (mono-syllable, bi-syllable, and sentence tests) were measured at preoperative baseline, at 1-week, and 1-month follow-up visit post-operatively. Advantage of early switch-on was defined when the scores of any tests were more than 50%. **결과:** Fifty-one were children and fifty were adults. Prelingual deaf ears were 54 and postlingual were 47. Early switch-on was well tolerated by patients and caused no complications like wound problem. Advantage of early switch-on was observed in 9%(3 of 33) at 1-week and 33%(11 of 33) at 1-month of prelingual deaf ears and all of them had already hearing rehabilitation with hearing aids. In sequential CI for bilateral hearing without any cochlear anomalies, advantage of early switch-on was observed in 39%(7 of 18) at 1-week and 72%(13 of 18) at 1-month. For postlingual deaf ears, advantage

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of early switch-on was observed in 55%(26 of 47) at 1-week and 77%(36 of 47) at 1-month. **결론:** The current study showed that early switch-on after CI is safe and provides several advantages. First, the early activation could reduce additional hospital visits for activation, and allowed the patient to start auditory fitting process as early as possible without any related complications. Furthermore, early switch-on could provide meaningful speech perception ability even at 1 week post-activation in many prelingual deaf children with previous auditory experience and postlingual adults who already established auditory pathways.

#### OTOP-59 14:50~15:00

### ETIOLOGIC DIAGNOSTIC YIELD OF MOLECULAR GENETIC TESTING COMBINED WITH IAC-MRI FOR DEAFNESS FROM PEDIATRIC CI IMPLANTEES AND ITS CLINICAL IMPLICATIONS

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YOONJOONG KIM<sup>1</sup>, DOO YI OH<sup>2</sup>, SEUNGMIN LEE<sup>2</sup>, JIN HEE HAN<sup>2</sup>, MIN YOUNG KIM<sup>2</sup>, BYUNG YOON CHOI<sup>2</sup>

**목적:** 유전자 검사와 IAC-MRI를 통한 유소아 고/심도 난청에 대한 원인 파악과 더불어, 난청의 병인을 정확하고 효율적으로 찾아낼 수 있는 프로토콜을 정립하고자 한다. **방법:** 분당서울대학교병원에 내원한 환자 중 양측 고/심도 난청에 대하여 2010년 5월부터 2019년 5월 사이에 15세 이전 인공와우이식술을 시행 받은 환아를 후향적으로 모집하였다. 전체 환아군을 유전자 진단과 자기공명영상검사를 모두 시행한 환자(n=70) 혹은 두 검사 중 하나만 확인 가능하지만(유전자 검사(n=4), IAC-MRI(n=4)) 해당 검사를 통해 난청의 병인이 명백하게 밝혀진 환자로 나누어 검사 결과를

분석하였다. **결과:** 총 78명의 환아군에서 유전자 이상 혹은 MRI검사상 이상을 발견하여 난청의 원인을 발견한 경우는 69명(88.4%)이었다. 구체적으로, IAC-MRI상 이상이 밝혀지지 않은 환자 중 유전자 검사만을 통해서 원인이 밝혀진 예(1군)는 38명이었고, 유전자검사와 IAC-MRI에서 모두 이상 소견을 보인 예(2군)는 8명이었으며, 유전자검사에서만 이상 소견이 없거나(n=17) 혹은 유전자 검사를 시행하지 않았지만(n=6) IAC-MRI에서 병인을 찾은 환아(3군)는 23명이었다. 9명(11.5%, 4군)은 유전자검사와 MRI 모두 시행하였음에도 병인이 밝혀지지 않았다. 1군에서 총 14종류의 유전자변이가 발견되었으며, 가장 많은 원인유전자는 GJB2였다. 2군에서 가장 흔한 유전자는 SLC26A4였으며, 이외에 POU3F4가 있었고, 3군에서 가장 많은 MRI 이상 소견은 청신경부전/저형성(n=12)이었으며, 내이이형성(n=9), 뇌백질이상(n=5) 소견들도 관찰되었다. IAC-MRI를 먼저 수행하는 것으로 가정했을 때, 전체 78명 중에 31명(39.7%)에서는 현재 수준의 유전자검사를 생략해도 같은 etiologic diagnosis에 도달할 수 있다. **결론:** 인공와우를 필요로 하는 유소아 난청 환자에서 오직 유전자 진단으로 만 원 인규명이 가능한 경우는 48.7%였으며, IAC-MRI로만 원인 진단이 가능한 경우는 29.5%이다. IAC-MRI와 유전자검사를 함께 시행한다면 88.5%에서 난청의 원인에 대한 유전학적/해부학적 규명이 가능하며, 절반 이상은 유전자변이가 그 원인이다. 39.7%에서는 유전자 상담을 전제하지 않는다면, 필수적인 IAC-MRI만으로 난청의 원인 규명이 가능하므로 현재의 유전자 검사 수준에서는 유전자 검사를 생략할 수 있다. 결론적으로 IAC-MRI에 대한 검사를 초기에 시행함으로써 원인진단의 효율을 높일 수 있다.

#### OTOP-60 15:00~15:10

### THERAPEUTIC EFFICACY OF SUPER HIGH-DOSE STEROID THERAPY IN PATIENTS WITH PROFOUND SUDDEN SENSORINEURAL HEARING LOSS COMPARISON WITH CLASSICAL STEROID THERAPY

DEPARTMENT OF OTORHINOLARYNGOLOGY, MYONGJI

## HOSPITAL

JIN WOOK KANG, JA WON GU, MEE HYUN SONG,  
SANG KWON IM, DAE BO SHIM

**목적:** The purpose of this study is to compare the efficacy of super high-dose steroid therapy with that of conventional steroid therapy in patients with profound sudden sensorineural hearing loss (SSNHL). **방법:** This study was retrospectively performed from January 2010 to May 2017. Fifty-two patients diagnosed with profound SSNHL were analyzed retrospectively. These patients were divided into the following groups based on their steroid regimen: conventional steroid regimen (dexamethasone 0.15 mg/kg/day for 10 days) was applied in Group 1 and Super high-dose steroid regimen (dexamethasone 0.225 mg/kg/day for 14 days) was applied in Group 2. We compared the treatment outcomes between the two groups at 2 weeks and 4 weeks after the initial treatment according to the Siegel's criteria. **결과:** Of the total 52 patients, 31 were in Group 1 and 21 were in Group 2. There were no significant differences in clinical characteristics between the two groups. There was no difference in the recovery rates between the two groups when comparing patients according to the four recovery types by Siegel's criteria. The complete recovery rate by Siegel's criteria was higher in group 2 (14.3%) compared with group 1 (0%), although there was no statistically significant difference. When confirming the recovery beyond 'partial recovery' based on Siegel's criteria, the recovery rate was statistically significantly higher in group 2 than in group 1 patients ( $p = 0.022$  at 2 weeks,  $p = 0.035$  at 4 weeks, respectively). **결론:** Profound SSNHL patients treated with super high-dose steroid regimen showed recovery to serviceable hearing levels compared to patients treated with conventional steroids. This information may be helpful for clinicians in counseling and managing the patients with profound SSNHL.

## OTOP 11

## 전정질환 II

14:10~15:10 • 세미나실3

Chairperson(s) : 구자원(서울의대), 안성기(경상의대)

OTOP-61 14:10~14:20

### VARIABILITY OF GAIT, BILATERAL COORDINATION IN UNILATERAL VESTIBULAR LOSS PATIENTS

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KOSIN UNIVERSITY COLLEGE OF MEDICINE, BUSAN, KOREA, <sup>2</sup>NEUROSCIENCE RESEARCH INSTITUTE, GACHEON UNIVERSITY, INCHEON, REPUBLIC OF KOREA  
JUN SANG CHA<sup>1</sup>, NAMBEOM KIM<sup>2</sup>, HWAN HO LEE<sup>1</sup>

**목적:** Between April 2017 and January 2019, 30 patients diagnosed with unilateral peripheral vestibular deficit presumed to be caused by VN were enrolled in this study. The shoe-type IMU was used to analysis subjects. We assessed gait speed, cadence, stride length, stance phase, normalized stride length, normalized step length, phase coordination index (PCI) and gait asymmetry (GA) of data from shoe-type IMU sensors with the walking protocol. **방법:** Between April 2017 and January 2019, 30 patients diagnosed with unilateral peripheral vestibular deficit presumed to be caused by VN were enrolled in this study. The shoe-type IMU was used to analysis subjects. We assessed gait speed, cadence, stride length, stance phase, normalized stride length, normalized step length, phase coordination index (PCI) and gait asymmetry (GA) of data from shoe-type IMU sensors with the walking protocol. **결과:** We identified spatiotemporal parameters of human gait. The gait speed of patients with VN was decreased to  $3.82 \pm 0.8$  compared to  $4.93 \pm 1.08$  in the healthy group. In addition, there were differenc-

18일 (금)

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es in normalized stride length, normalized gait speed and related gait parameters, when comparing VN group and the healthy group. Base width fluctuations showed large variability magnitudes that increased depending on vestibular function. **결론:** Gait analysis by the use of shoe-type IMU could provide important information regarding vestibular pathophysiology in patients with VN. Gait performance tests can examine gait variability quantitatively. It will be taken into consideration as assessment of fall risk for patients with vertigo.

#### OTOP-62 14:20~14:30

### CORRELATION BETWEEN FACIAL ANATOMY VARIANCES AND THE INCIDENCE OF ARTIFACTS DURING VIDEO HEAD IMPULSE TEST

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY DANKOOK UNIVERSITY, COLLEGE OF MEDICINE

KWANG-HYUN BYUN, HYE-SOO RYU, JI-EUN CHOI, JAE YUN JUNG, MIN YOUNG LEE

**목적:** 비디오두부충동검사(video head impulse test)는 안구운동을 통해 6개의 반고리관 기능을 확인할 수 있는 유용한 검사이다. 하지만, 크고 작은 오류가 많이 발생하는 검사이기도 하며, 이 오류들이 검사 의 방법이 나 해석에 영향을 줄 수 있는 것으로 알려져 있다. 본 연구는 발생할 수 있는 다양한 오류들이 얼굴 구조와 연관성이 있는지 확인해 보았다. **방법:** 2018년도 11월부터 2019년 5월까지 어지럼증 과거력이 없는 건강한 성인 12명이 포함되었다. 검사 자는 전문검사자와 비전문 검사자가 2명이었다. ICS검사 기기에서 개별 안구의 움직임을 확인하여 오 류(Rejection, Rebound, Notch, Catch up saccade)의 발생 비율이 실험자의 얼굴 구조 [Glabella/Rhinion의 높이, 머리의 형태(가로/세로), 안구의 위치(centralization정도), 안구의 비율(안구 세로/가로)]와 상관관계가 있는지 6개의 세반고리관을 확인하였다. **결과:** 전문검사자와 비전문검사자 모두에서

Rebound와 Notch(during or after eye movement)의 발생이 얼굴의 구조와 상관관계를 보였다. 전문검사자의 경우 Rhinion이 높을 수록 Glabella가 낮을 수록 눈이 중심으로 몰릴 수록 오류의 비율이 높았다. 비전문 검사자의 경우 역시 Glabella의 높이, 눈 의 위치, 안구의 비율이 오류와 상관관계를 보였으나, 전문검사자와는 다르게 눈이 중심에서 벗어 날 수록 오류가 높았고 Glabella의 높이는 높은 경우 Rebound가 많았고, 낮은 경우 Notch의 발생이 높았다. 오류와 얼굴 구조와 상관관계는 모든 세반고리관이 아닌 특정 반고리관에서 그 연관성을 확인 할 수 있었다. 그리고 전문검사자의 경우 총 4개의 상관관계를, 비전문검사자의 경우 6개의 상관관계를 확인할 수 있었다. **결론:** 전문 검사자, 비전문 검사자 모두 Glabella의 높이가 가장 오류와 연관성이 높았으며, 그 오류 중 Rebound와 의 상관 관계가 있음(관련이 있었던 반고리관은 다르지만)을 확인하였다. 전문 검사자는 비전문검사자에 비해 상관관계를 보인 경우가 적어서 검사 숙련도도 오류에 영향을 줄 수 있음을 알 수 있었다.

#### OTOP-63 14:30~14:40

### RELATIONSHIP BETWEEN THE DIRECTION OF NULL PLANE AND THE DIRECTION OF NYSTAGMUS IN HEAD ROLL TEST AND BOW AND LEAN TEST IN PATIENTS WITH PERSISTENT GEOTROPIC DIRECTION-CHANGING POSITIONAL NYSTAGMUS

DEPARTMENTS OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY DONGTAN SACRED HEART HOSPITAL, HALLYM UNIVERSITY COLLEGE OF MEDICINE

SUNG WON LI, SUNG KYUN KIM, MIN GYEONG SHIM, SEOK MIN HONG

**목적:** 머리회전검사(Head roll test)에서 항지성방향전환성두위안진(Geotropic direction-changing postional nystagmus)을 보이는 환자는 canalolithiasis 기전의 일과성 방향전환성두위안진(Transient direction-changing postional nystagmus, t-DCPN)과 light cupula 기

전으로 설명할 수 있는 지속성 방향전환성두위안진 (Persistent direction-changing positional nystgmus, p-DCPN))으로 구분된다. 본 연구에서는 두 군에서 머리회전검사와 더불어 Bow and Lean 검사를 시행하여, 두 검사에서 보이는 안진의 방향과 null plane의 방향과의 관계를 통해 t-DCPN과는 다른 p-DCPN의 병태생리기전을 이해하는데 도움을 주고자 하였다. **방법:** 이 연구는 전향적 연구방식으로 2018년 9월 1일부터 2019년 6월29일까지 본원 이비인후과에 내원한 어지럼을 호소하는 환자 중, 양와위에서 머리회전검사에서의 항지성방향전환성두위안진을 보이는 환자들이 대상에 포함되었다. p-DCPN은 머리회전검사에서 null-plane이 존재하고 양측 모두 2분이상의 항지성안진을 가지는 경우로 정의하였고 t-DCPN은 1분이하의 항지성안진을 환자들을 포함시켰다. 모든 환자는 자세한 문진과 함께 이학적검사 및 전정기능검사를 시행하였으며 전정신경염, 메니에르, 돌발성난청이 동반된 경우는 배제하였다. **결과:** 전체 항지성 방향전환성 두위안진을 보인 환자는 64명이었으며 그중에 p-DCPN 환자군 29명(평균54세), t-DCPN 환자군 35명(평균50세)이었다. Bow and Lean 검사에서 안진이 나타난 경우는 p-DCPN군에서 29명중 24명, t-DCPN 군에서 35명중 14명으로 두군 사이에 통계적으로 의미 있는 차이가 있었다.( $p < 0.05$ ) p-DCPN 환자군에서 null plane의 방향과 머리회전검사에서 빠른 속도의 안진이 발생하는 방향과 일치여부를 확인 하였을 때 9명은 동일한 방향이었으나 20명은 반대방향이었고 null plane의 방향과 Bow 검사에서의 안진방향이 일치하는 경우가 22명이며 안진방향이 반대인 경우는 2명이었다. 머리회전검사에서 빠른 속도의 안진이 발생하는 방향과 Bow 검사에서 안진의 방향이 일치하는 경우는 t-DCPN군에서 14명중 12명, p-DCPN군에서 24명중 9명으로 의미있는 차이를 보였다.( $p < 0.05$ ) **결론:** p-DCPN군에서 null plane의 방향과 머리회전검사에서 빠른 속도의 안진이 나타나는 방향과 반대로 나타나는 경우가 많았으며, null plane의 방향과 Bow 검사방향은 대체로 일치하였다. 이러한 현상을 설명하기 위해서는 해부학적인 팽대부릉정의 방향 또는 머리회전검산시 머리의 회전각에 따라 발생하는 안진에 대한 연구가 필요할 것으로 생각된다.

OTOP-64 14:40~14:50

### CAN OSTEOPENIA INDUCE RESIDUAL DIZZINESS AFTER BENIGN PAROXYSMAL POSITIONAL VERTIGO

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHUNGANG UNIVERSITY SCHOOL OF MEDICINE

HYUNKYU CHAE<sup>1</sup>, MUNYOUNG CHANG<sup>1</sup>, KANGDUK SUH<sup>1</sup>, SEO-KYUN MUN<sup>1</sup>

**목적:** The aim of this study was to determine whether there is an association between osteopenia and residual dizziness after successful treatment of benign paroxysmal positional vertigo (BPPV). **방법:** This study included 62 patients with canalolithiasis type BPPV. Patients were divided into two groups according to the presence of residual dizziness after resolution of BPPV. The univariate analysis and multivariate analysis were performed to figure out the factors associated with residual dizziness. Age, sex, affected semicircular canal, affected side, duration of BPPV, hypertension, diabetes mellitus, hyperlipidemia, and osteopenia were analysed. **결과:** In the univariate analysis, duration of BPPV and osteopenia showed relatively significant association ( $P < 0.20$ ) with the development of residual dizziness. Multivariate analysis was performed using these factors. Osteopenia remained a statistically significant factor with association with residual dizziness ( $P = 0.012$ , OR 9.916). **결론:** Osteopenia was associated with the development of residual dizziness. BPPV patients with osteopenia suffered more frequently from residual dizziness after successful treatment of BPPV than patients without osteopenia.

OTOP-65 14:50~15:00

### EFFECTS OF VESTIBULAR REHABILITATION IN PATIENTS WITH ACUTE VESTIBULOPATHY

18월 (금)

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(OTOP)비과 구역  
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DEPARTMENT OF OTOLARYNGOLOGY HEAD AND NECK  
SURGERY, INJE UNIVERSITY COLLEGE OF MEDICINE,  
HAEUNDAE PAIK HOSPITAL

YEONG JUN PARK, MOO JIN BAEK, SHIN HYE KIM

**목적:** Vestibular rehabilitation is an exercise-based treatment program designed to promote vestibular adaptation and substitution in patients with unilateral vestibular hypofunction. We evaluated the short term effect of vestibular rehabilitation by assessing correlation between performance degree of rehabilitation (PDR) and parameters in rotation chair test (RCT). **방법:** Forty-two patients with acute unilateral vestibulopathy underwent RCT in the initial and 2 weeks after vestibular rehabilitation. Age, sex, canal paresis in caloric test, and change of gain/asymmetry/phase in RCT before and after vestibular rehabilitation were investigated. All participants performed vestibular rehabilitation with printed material in their home, and self-reported PDR with VAS scale. Relevance between PDR and differences of gain/asymmetry/phase in RCT was analyzed with Pearson correlation test. **결과:** The mean age of the patients was  $54.6 \pm 15.7$  years and there was a slight female preponderance (M:F=1:1.3). In the caloric test, 62% (N=26) of the patients revealed to have significant increased canal paresis (CP>20), while 38% (N=16) showed normal caloric response. Follow-up RCT was performed at 16.6 days after initial RCT. PDR showed significant correlation with gain in 0.02 Hz ( $p=0.021$ ), gain in 0.04 Hz ( $p=0.024$ ), and asymmetry ( $p=0.012$ ) of RCT. There was no relation between PDR and phase of RCT. Age was not related with PDR, but younger patients showed higher gain in 0.01 Hz of RCT. **결론:** This study confirmed the effect of vestibular rehabilitation to improve low-frequency gain and correct vestibular asymmetry in RCT. From this, brief period of vestibular rehabilitation is sufficient to facilitate vestibular recovery in patients with unilateral vestibular hypofunction.

OTOP-66 15:00~15:10

## EFFECT OF AGING AND DIRECTION OF IMPULSE IN SUPPRESSION HEAD IMPULSE TEST

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND  
NECK SURGERY, SUNGKYUNKWAN UNIVERSITY SCHOOL  
OF MEDICINE, KANGBUK SAMSUNG HOSPITAL

JUNG-YUP LEE, MIN-BEOM KIM

**목적:** The aim of this study was to identify the difference of vestibulo-ocular reflex (VOR) gain value and peak saccadic velocity (PSV) in the suppression video head impulse test paradigms (SHIMP) according to the age of the subject and the direction of the impulse. **방법:** Between October 2017 and May 2019, we enrolled the subjects who had previous history of dizziness but no current dizziness at least 1 month ago. We conducted cervical vestibular evoked myogenic potential (cVEMP) and caloric test, as well as video head impulse test (vHIT). Among them, we excluded the subjects who had abnormal cVEMP results (asymmetry ratio of greater than 30%) and abnormal caloric test results (caloric paresis of greater than 25%). **결과:** We included 647 subject (192 men, 455 women) aged 10 to 87 years. The mean VOR gain and PSV were maintained in subjects at below 70 years (VOR gain,  $0.991 \pm 0.08$ ; PSV,  $348.47 \pm 142.32$ ). However, the decrease of VOR gain and PSV was significant in subjects over 70 years (VOR gain,  $0.928 \pm 0.09$ ; PSV,  $315.51 \pm 0.09$ ,  $p < 0.001$ ). The mean VOR gain of rightward impulse ( $1.00 \pm 0.09$ ) was higher than the leftward impulse ( $0.96 \pm 0.08$ ,  $p < 0.001$ ). The mean PSV of rightward impulse did not show significant difference with leftward impulse. But, the ratio of PSV to peak head velocity (PHV) of rightward impulse ( $2.046 \pm 0.31$ ) was higher than the leftward impulse ( $2.005 \pm 0.31$ ,  $p < 0.001$ ). **결론:** Both VOR gain and PSV of SHIMP declined with increasing age over 70 years. In addition, VOR gain of rightward impulse was higher than the leftward impulse in right-eye recordings.



Furthermore, PSV/PHV of rightward impulse was higher than the leftward impulse. These normative values of VOR gain and PSV would allow us to compare the results of any particular patient with that of healthy people in a particular age range.

## OTOP 12

청신경계 및 청각학 I

15:40~16:40 • 그랜드홀1

Chairperson(s) : 박경호(가톨릭의대), 이치규(순천향의대)

OTOP-67 15:40~15:50

### INCREASED FUNCTIONAL CONNECTIVITY BETWEEN THE PARAHIPPOCAMPUS AND INFERIOR PARIETAL LOBULE IN SUBJECTS WITH HEARING LOSS MAY RESULT IN THE GENERATION OF TINNI-TUS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

JAE-JIN SONG, DIRK DE RIDDER

**목적:** Peripheral hearing loss (HL)-induced changes in the central auditory system is a prerequisite for the generation of subjective tinnitus. However, there are cases with considerable amount of HL without any development of tinnitus, and this question on the differences between HL with our without tinnitus with regard to the cortical activity has never been addressed. In this regard, we compared resting-state quantitative electroencephalography (rs-qEEG) findings between the HL with tinnitus (HL-T) group and with no tinnitus (HL-NT) group with regard to functional connectivity. **방법:** Sixty-one HL-NT

subjects were enrolled prospectively, and 61 HL-T subjects were selected from our database. The hearing thresholds were strictly matched between the two groups, and only subjects with low distress level (grade 1 or 2) were enrolled for the HL-T group. Rs-qEEG was measured in all included subjects and compared between the 2 groups with regard to functional connectivity differences. **결과:** As compared with the HL-NT group, the HL-T group showed increased functional connectivity between the parahippocampus and the inferior parietal lobule for the delta and beta 1 frequency bands. **결론:** Hearing loss subjects may develop tinnitus when their auditory memory stored in the parahippocampus is strongly associated with the perception network comprising of the inferior parietal lobule.

OTOP-68 15:50~16:00

### HIGH RISK OF SUDDEN SENSORINEURAL HEARING LOSS IN SEVERAL AUTOIMMUNE DISEASES ACCORDING TO A POPULATION-BASED NATIONAL SAMPLE COHORT STUDY

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, NATIONAL HEALTH INSURANCE SERVICE ILSAN HOSPITAL,

<sup>2</sup>DEPARTMENT OF POLICY RESEARCH AFFAIRS, NATIONAL HEALTH INSURANCE SERVICE ILSAN HOSPITAL

JUNHUI JEONG<sup>1</sup>, HYUNSUN LIM<sup>2</sup>, TAE SEONG EO<sup>1</sup>, KYUIN LEE<sup>1</sup>, CHANG EUI HONG<sup>1</sup>, HYUN SEUNG CHOI<sup>1</sup>

**목적:** We investigated the risk of sudden sensorineural hearing loss (SSNHL) in patients with autoimmune diseases compared with a control group in a population-based study using a National Health Insurance Service National Sample Cohort data from Korea. **방법:** We enrolled autoimmune-disease patients who were  $\geq 20$  years old in 2006 into the autoimmune-disease group, and we selected a control group

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that had similar demographic characteristics as the autoimmune group. We tracked the two groups from 2006 to 2015 and compared the proportion of patients who developed SSNHL between them. **결과:** Among the 13,250 in the autoimmune-disease group, 145 experienced an SSNHL event (1.09%). Among the 66,250 in the control group, 484 experienced an SSNHL event (0.73%). The SSNHL risk was significantly higher in the autoimmune-disease group than in the control group. SSNHL incidence was significantly higher among patients with antiphospholipid syndrome (APS), multiple sclerosis (MS), rheumatoid arthritis (RA), and connective tissue diseases including Sjögren syndrome and Behçet's disease compared to the control group. In detailed stratified analyses using reinforced additional diagnostic codes, 'Special Exception of Assessment' codes, only RA patients had significantly higher SSNHL incidence than the control group. **결론:** The association of several autoimmune diseases with SSNHL was evaluated in this large-scale, population-based, big data study. The risk of SSNHL was significantly higher in patients with APS, MS, RA, and connective tissue diseases including Sjögren syndrome and Behçet's disease compared with patients without autoimmune diseases. In particular, SSNHL was significantly associated with RA according to detailed analyses using reinforced additional diagnostic codes.

**OTOP-69 16:00~16:10**

### **CORTICAL ACTIVITY PATTERN EVOKED BY CHANGE OF SOUND LOCATION IN SINGLE-SIDED DEAFNESS**

<sup>1</sup>LABORATORY OF BRAIN & COGNITIVE SCIENCES FOR CONVERGENCE MEDICINE, HALLYM UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF OTOLARYNGOLOGY, HALLYM UNIVERSITY COLLEGE OF MEDICINE  
JI-HYE HAN<sup>1</sup>, JIHYUN LEE<sup>1</sup>, HYU-JEONG LEE<sup>1,2</sup>

**목적:** Profound unilateral deafness(UD) reduces the ability to detect sound location which is achieved by binaural hearing. Further, it causes change in the pattern of cortical activation due to monaural stimulation through the intact ear. In this study, we examined N1/P2 auditory cortical activities in response to different sound location and the pattern of hemispheric asymmetry while acquired UD passively engaged in a sound localization task. **방법:** Eleven unilateral profoundly deaf adults and nine normal-hearing (NH) controls participated. Among the UD group, 4 had left- and 7 had right-sided deafness. Cortical auditory evoked potentials were recorded from 64 scalp electrodes in passive listening conditions. Speech stimuli were CV syllable /ba/ and /pa/ with the total duration of 450ms. A sound localization task consisted of speech coming from straight ahead (0o), and from either 15o or 60o to the healthy ear (15o or 60o) or deaf ear (-15o or -60o). For the noise condition, +5dB of speech-shaped noise was added to the /ba/ stimulus. Behavioral measures included detection and reaction time obtained from active listening condition as well as K-SPIN test. **결과:** Behavioral results revealed that UD group had lower performance for detection in sound localization compared to NH. Electrophysiology data showed that N1/P2 amplitudes in quiet were significantly larger compared to noise condition. Dipole source analysis showed that N1 dipole source activities in NH were greater than Lt. and Rt. deafness groups. The N1 dipole latencies in UD were delayed compared to NH groups. Differential lateralization pattern was revealed such that P2 dipole activity ipsilateral to the stimulation was higher in left-sided deafness, while no lateralization was found in NH and right-sided deafness. In addition, the degree of N1/P2 amplitude change was correlated with the duration of deafness and word perception in noise. **결론:** The effects of sound localization were not revealed in N1/P2 cortical responses in SSD. Rather, the effects of noise masking on sound localization were

reflected in cortical responses. The results show that cortical reorganization induced by unilateral deafness would be different depending on the side of deafness.

#### OTOP-70 16:10~16:20

### ASSOCIATION BETWEEN HEARING LOSS AND COGNITIVE DISORDER A NATIONWIDE POPULATION-BASED STUDY

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA <sup>2</sup>DEPARTMENT OF BIostatistics, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA<sup>11111111</sup>

SUN IK KIM<sup>1</sup>, YOUNG-HOON JOO<sup>1</sup>, KYUNG-DO HAN<sup>2</sup>, KYOUNG-HO PARK<sup>1</sup>

**목적:** Hearing loss and cognitive disorder are world-wide public-health concerns. There are studies that suggest there may be a relationship between hearing loss and cognitive disorder, but there have been no large scale cross-sectional epidemiologic studies of a representative sample of the entire national population to look at this possible association. The aim of this national population-based retrospective study was to investigate the relationship between hearing loss and cognitive disorder in South Korea using data from the Korean Health Insurance claims database during 2009–2015. **방법:** We analyzed cross-sectional data of 66-year-olds who completed the Korea National Health and Nutrition Examination Surveys. **결과:** Among the 1,815,835 participants at the age of 66, the prevalence of unilateral hearing loss was 5.84% and that of bilateral hearing loss was 3.40%. The normal cognitive group was 86.35% and the high-risk group for cognitive disorder was 13.65%. The bilateral hearing loss group had the highest percentage of subjects who responded “sometimes or frequently” to all five questionnaires about cognitive disorder compared to

the normal hearing or unilateral hearing loss group. After adjustment for gender, smoking status, alcohol intake, exercise, income, diabetes, hypertension, dyslipidemia, and depression, the hazard ratio (HR) of cognitive disorder was 1.183 (95% confidence interval [CI], 1.163–1.203) for bilateral hearing loss and 1.141 (95% CI, 1.126–1.156) for unilateral hearing loss compared to the normal cognitive group. The HR for the bilateral hearing loss compared with normal hearing or unilateral hearing loss group was increased in all five questionnaires about cognitive disorder after adjustment for confounders. **결론:** Hearing loss has a significant effect on cognitive function in the Korean population. In our study, the bilateral hearing loss group showed poorer cognitive function than did the unilateral hearing loss group

#### OTOP-71 16:20~16:30

### REPRODUCTIVE FACTORS, HORMONE THERAPY, AND HEARING LOSS IN POSTMENOPAUSAL WOMEN: FINDINGS FROM BIG DATA ANALYSIS BASED ON THE KOREAN NATIONAL HEALTH AND NUTRITION SURVEY

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, JEJU NATIONAL UNIVERSITY COLLEGE OF MEDICINE,

<sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

JEE YOUNG SUH<sup>1</sup>, SUNG HUHN KIM<sup>2</sup>

**목적:** To investigate the effect of endogenous and exogenous female hormones on hearing impairment in postmenopausal women **방법:** A retrospective community-based survey analysis was conducted. Data collected by the Korean National Health and Nutrition Survey between January 1, 2010 to December 31, 2012 were used, and data analyses were performed from May 1 to 25, 2019. Participants comprised 3,653 postmenopausal women without a history of chron-

ic otitis media. Women who completed the health questionnaires of the Korean National Health and Nutrition Survey between 2010–2012, and who had available results from otologic examinations including pure tone audiogram, were included. Pure-tone average hearing thresholds were calculated at 500, 1,000, 2,000, and 4,000 Hz. Detailed reproductive histories and use of hormone replacement therapy (HRT) were obtained. Complex-sample linear regression models, controlling for confounding factors, were generated to determine whether hormone-related factors were associated with hearing loss (mean hearing threshold, frequency specific, or audiometry configuration analyses). **결과:** Women who experienced late menopause had lower adjusted beta coefficient of hearing threshold ( $\beta = -0.184$ , 95% CI =  $-0.305$  to  $-0.060$ ,  $p = 0.003$ ). The results also suggested that hormone replacement therapy may be beneficial for attenuating hearing loss ( $\beta = -1.353$ , 95% CI =  $-2.339$  to  $-0.368$ ,  $p = 0.007$ ); in particular, high frequency of hearing (3kHz:  $\beta = -1.859$ , 95% CI =  $-3.197$  to  $-0.522$ ,  $p = 0.007$ ; 4KHz:  $\beta = -2.058$ , 95% CI =  $-3.583$  to  $-0.532$ ,  $p = 0.008$ ; 6KHz:  $\beta = -3.810$ , CI =  $-5.464$  to  $-2.156$ ,  $p < 0.001$ ). **결론:** Late menopause, and use of HRT attenuate hearing loss. These epidemiologic data provide evidence that estrogen may help attenuate age-related hearing decline.

#### OTOP-72 16:30~16:40

### THE REPORT OF HEARING ABNORMALITY FOR PRE-SCHOOL AND SCHOOL AGE IN JEOLLA-BUK-DO

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONBUK NATIONAL UNIVERSITY SCHOOL OF MEDICINE, <sup>2</sup>RESEARCH INSTITUTE OF CLINICAL MEDICINE OF CHONBUK NATIONAL UNIVERSITY-BIOMEDICAL RESEARCH INSTITUTE OF CHONBUK NATIONAL UNIVERSITY HOSPITAL, JEON-JU, KOREA

SU GEUN KIM<sup>1</sup>, EUN JUNG LEE<sup>1</sup>

**목적:** Early diagnosis and early intervention of hearing impairments have been controversially global issues. The screening for hearing loss, only includes five hearing questions related to hearing impairment. As a result, it shows difficulty in discriminating as well as lack of accuracy in evaluating hearing loss **방법:** 640 preschool and school-aged children attended in the screening test batteries for hearing loss. The tests consisted of otologic physical examination, weber test and pure tone screening (PTS) audiometry whereby the PTS provided four frequency such as 0.5kHz, 1kHz, 2kHz and 3kHz. Regardless the ear sides, if the measured results were over 25dB, the kid would be noted as 'Fail'. The children having 'Fail' label were supposed to participate in a generalized hearing test including Tympanogram, PTA, SA, TEOAEs, DPOAEs and ABR conducted in Chonbuk National University hospital **결과:** 119 (18.6%) out of 1280 ears (640 children) were classified as abnormal after the physical examination. In detail, AOM 3 (0.5%), COM 26 (4.1%), MOE 6 (1%), Blood dot/ Injection 10(1.6%), cerumen impacted 68 (10.8%), retraction 6 (1%). Besides, the findings of weber test indicated that 12 children (1.9%) were unilateralized. Moreover, among 640 children who experienced PTS, there are 77 children (12%) were referred as 'Fail' but 7 of them took part in the hearing test in Chonbuk National University hospital. It was noted that 5 out of 7 kids (71.4%) diagnosed with hearing loss **결론:** To sum up, if the PTS is implemented at noise less than 40dB, it is possible to predict hearing impairment of preschool and school age children in spite of non-soundproof room or inconsistent environment. The findings emphasize outstanding effectiveness of currently researching method over the previously used examination involving five hearing questions. Nevertheless, results collected from 7 samples seem to be insufficient for representatives, which paves a way for further research to carry out

experiments in larger scale

## OTOP 13

청신경계 및 청각학 II

15:40~16:40 • 세미나실1

Chairperson(s) : 남의철(강원의대), 정재윤(단국대의대)

### OTOP-73 15:40~15:50

#### OVERACTIVATION OF RECEPTOR FOR ADVANCED GLYCATION END-PRODUCT (RAGE) IN THE PRIMARY AUDITORY CORTEX OF NOISE-INDUCED HEARING LOSS RATS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHA UNIVERSITY COLLEGE OF MEDICINE  
JAY CHOI, CHEONGSE WON, TAE HYUN SHIN, SUNG SU PARK, SO YOUNG KIM, CHANG HO LEE

**목적:** Noise-induced hearing loss induced neuroinflammation and attenuation of perineuronal nets (PNNs). Receptor for advanced glycation end-product (RAGE) is known to be involved in neuroinflammation. This study was aimed to investigate the RAGE-related molecular mechanism behind the neuroinflammation and PNNs decrease following noise-induced hearing loss. **방법:** Female Sprague-Dawley rats at postnatal day 14 were exposed to the 115 dB SPL white noise for 8 hours per daily for 3 days (noise group, n = 8). The age and sex-matched control rats were raised under standard conditions without noise exposure (control group, n = 8). Two hours after noise exposure, the primary auditory cortex was harvested. The expression levels of tumor necrosis factor (TNF)  $\alpha$ , interleukin (IL) 6, IL1 $\beta$ , nuclear factor (NF)- $\kappa$ b, Nmethyl Daspartate receptor

subunit 2A (NR2A), and total RAGE were evaluated using real-time reverse transcription polymerase chain reaction. The cytoplasmic and nuclear fractions were isolated in the primary auditory cortex. The protein expressions of nuclear RAGE and soluble RAGE were evaluated using western blotting in both cytoplasmic and nuclear fractions. **결과:** The noise group demonstrated increased auditory thresholds at 4,8,16, and 32 kHz. The pro-inflammatory genes of IL6, IL1 $\beta$ , and NF- $\kappa$ b were overexpressed in the noise group. The NR2A expression was increased in the noise group. The total RAGE expression was elevated in the noise group. The soluble RAGE in cytoplasmic fraction was 3.25 times increased in the noise group. On the other hands, nuclear RAGE in nuclear fraction was 0.22 times of control group. The ratio of shedding RAGE (cytosolic-RAGE/ nuclear-RAGE) was 4.69 times higher in noise group. **결론:** The noise exposure increased the shedding of RAGE to cytoplasm in the primary auditory cortex, which is related with the up-regulations of pro-inflammatory genes and NR2A.

### OTOP-74 15:50~16:00

#### GROWTH PATTERNS OF SPEECH PERCEPTION AFTER COCHLEAR IMPLANTATION IN POSTLINGUALLY DEAFENED ADULTS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, KOREA

YEHREE KIM, JEE YEON LEE, MIN YOUNG KWAK, JIN TAEK PARK, WOO SEOK KANG, JOONG HO AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** To investigate the effects of duration of deafness and age at cochlear implantation (CI) on growth patterns of speech perception performance in CI adults. **방법:** One hundred and twenty-nine postlingually deafened adults, with no labyrinthine anomalies or

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(RH-OP)

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cognitive deficits, who were followed up for more than two years postoperatively were included. Of those 84 patients were followed for more than 5 years. Subjects were divided into two groups according to their duration of deafness (group I: deaf duration  $\leq$  10y, n=95; group II: >10y, n=32). Group I was further divided according to their age at CI (group A:  $\leq$ 60y; group II: >60y). Monosyllabic word recognition score (WRS) was obtained before implantation, post 1, 3, 6, and every 6 months thereafter. The plateau of WRS was defined as the time taken to reach 2 consecutive best WRSs. **결과:** The plateau of monosyllabic test scores in group 1 was observed at 21.2 months, which was significantly earlier than 38.7 months in group 2 ( $p=0.007$ ). And the best WRS (66.2%) of group 1 was significantly higher than that (54.0%) of group 2 ( $p=0.16$ ). For the patients aged less than 60 years, the best WRS (69.3%) was significantly higher than that (52.8%) of group B ( $p=0.01$ ). And the plateau of group A was observed at 20.3 months, which did not differ from 25.0 months of group B ( $p=0.47$ ). In group 1, 37% (35 of 95) reached their best scores within 6 months after surgery and 76% (72 of 95) within 2 years. **결론:** CI adults who were implanted with deaf duration shorter than 10 years showed higher WRS with shorter CI usage than those with deaf duration longer than 10 years. Auditory performance of adult CI improved for a long period of more than 2 years and longer auditory rehabilitation is needed even for CI adults.

#### OTOP-75 16:00~16:10

### QUANTITATIVE CRITERIA FOR AGE-RELATED HEARING LOSS USING AUDIOMETRIC CONFIGURATION ANALYSIS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, HALLYM UNIVERSITY, CHUNCHEON, REPUBLIC OF KOREA

JUN HO LEE, JUNGHWA BAHNG, CHULHO KIM, YOO YEON KIM

**목적:** we suggest the most adaptable criteria using prevalence matching between the prevalence of ARHL obtained using our suggested criteria and the average range obtained in previous reports. **방법:** We chose 30, 25, 20, and 15 dB as gap ranges of cutoff values of the descending type of hearing loss, between an average of low (500 Hz, 1 kHz) and high (4 kHz, 6 kHz) frequencies. Interaural difference was defined as 10 or 15 dB. Hearing loss was defined over 25 dB. We compared the prevalence results of the cross-matching criteria. We used data from the Korea National Health and Nutrition Examination Survey. **결과:** Among the eight possible criteria, age  $\geq$  65 years, average of all frequencies  $>$  25 dB at the each sides, gap between low- and high frequencies  $\geq$  20 dB, and interaural difference  $\leq$  10 dB were the most suitable criteria to suggest a quantitative definition of ARHL audiometrically. Early-onset ARHL (average of hearing loss  $\leq$  25 dB, gap between low- and high frequencies  $\geq$  20 dB, interaural difference  $\leq$  10 dB) and extended ARHL (gap between low- and high frequencies  $\geq$  20 dB on the side with better hearing, frequency of side with worse hearing side minus that of side with better hearing  $>$  10 dB) were additionally suggested. **결론:** In the current study, we recommend the new, quantitative ARHL criteria. The suggested criteria for ARHL might be easily accessed by other researchers to demonstrate their own hypotheses.

#### OTOP-76 16:10~16:20

### THE PRESENCE OF COCHLEAR NERVE DEFICIT REGION IN ADULT COCHLEAR IMPLANTATION: THE INFLUENCE ON THE CI PERFORMANCE

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN

COLLEGE OF MEDICINE, SEOUL, KOREA

YEHREE KIM, JEE YEON LEE, MIN YOUNG KWAK,  
JIN TAEK PARK, WOO SEOK KANG, JOONG HO  
AHN, JONG WOO CHUNG, HONG JU PARK

**목적:** To analyze the morphology of the cochlear nerve as seen on the temporal bone magnetic resonance imaging (TBMR) and to investigate its effect on the speech perception outcome of adult cochlear implantation (CI). **방법:** Eighty-seven postlingually deafened adults, with no labyrinthine anomalies or cognitive deficits, who were implanted with perimodiolar electrodes from single manufacturer were included. We reviewed the sagittal view of the TBMR and measured the diameter of the cochlear nerve and its diameter relative to that of facial nerve. We also analyzed the presence of 'bud sign' and 'tail sign' which represent the cochlear nerve in the high frequency region. We correlated the relationship between the MR findings of CN and the postoperative word recognition scores (WRS) in monosyllabic word recognition test. **결과:** Recipients with the positive 'bud sign' performed significantly better ( $71.9 \pm 22.2\%$ ) than those without ( $58.7 \pm 24.4\%$ ) ( $p=0.02$ ). Recipients with the positive 'tail sign' performed better ( $68.6 \pm 23.4\%$ ) than those without ( $59.8 \pm 24.6\%$ ), but the difference was not significant. There was a positive correlation between the shorter diameter of the cochlear nerve and the word recognition score ( $\rho=0.23$ ,  $p=0.04$ ). **결론:** Favorable performance could be expected in patients with larger cochlear nerve and identifiable nerve fibers at the basal turn (bud sign). These findings suggest that there is a 'cochlear nerve deficit region' which could be identified in MR and might be a prognostic factor in predicting the CI performance.

**OTOP-77 16:20~16:30**

**INFLUENCE OF TINNITUS ON SOUND LOCALIZA-**

## TION TEST

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND  
NECK SURGERY, UNIVERSITY OF ULSAN COLLEGE OF  
MEDICINE, ASAN MEDICAL CENTER

EUN JEONG HWANG, JOONG HO AHN

**목적:** The purpose of this study was to investigate the influence of tinnitus, whether it originated from right, left, or both sides, on sound localization process. **방법:** From Jan 2019 to Jul 2019, a total 59 chronic tinnitus patients were enrolled in this study. Of 59 patients, we selected 42 patients (23 males and 19 females) whose mean hearing were less than 60 dBHL and whose net average hearing of both sides were 15 dB or less. Fifteen patients complained of bilateral tinnitus, while 14 and 13 patients complained of right and left tinnitus respectively. Sound localization using three different 3-second pure tone sounds (500 Hz at 65 dB SPL, 4 kHz at 65 dB, and 4kHz at 90 dB) was assessed using an array of 7 speakers at head level separated by approximately 30 degrees. **결과:** There were no significant differences in sound localization ability whether patients complained any type tinnitus. Furthermore, high scores of THI or VAS didn't affect sound localization process. **결론:** From this study, we concluded that even though patients were suffered from severe tinnitus, they might not have difficulties in sound localization unless there is unilateral or bilateral hearing loss.

**OTOP-78 16:30~16:40**

## THE SIGNIFICANCE OF NEUTROPHIL-LYMPHOCYTE-RATIO AND PLATELET-LYMPHOCYTE-RATIO IN ACUTE LOW TONE SENSORINEURAL HEARING LOSS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK  
SURGERY, HANYANG UNIVERSITY COLLEGE OF MEDICINE  
KEON-HO KIM<sup>1</sup>, HEE JEONG KANG<sup>2</sup>, CHUL WON

18일 (금)

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(OTOP)비과 구역  
(RH-OP)두경부 구역  
(HN-OP)

TPP

PARK<sup>3</sup>, HA YOUNG BYUN<sup>4</sup>, JAE HO CHUNG<sup>5</sup>, SEUNG HWAN LEE<sup>6</sup>

**목적:** 급성 저음역 감각신경성 난청(ALHL)은 저음역에 국한되어 급성으로 발생하는 청력손실을 의미하며, 돌발성난청의 한 종류로 생각되지만 그 증상, 경과, 예 후 등에서 다른 특성을 보여 새로운 질병으로 간주되기도 한다. 한편 최근 돌 발성 난청의 병인으로서 만성 염증과 혈전에 의한 허혈이 제시되고 있고, 이에 여러 연구들에서 호중구-림프구 비율(NLR)과 혈소판-림프구 비율(PLR)이 유의 하게 증가되어 있으며 예후를 예측하는 인자로도 의미가 있다고 보고되고 있다. 이에 본 연구에서는 ALHL로 치료받았던 환자들을 대상으로 임상 양상, 검 사 결과 및 예후를 비교 분석하여 NLR과 PLR의 의의를 알아보고 진단 및 예후 예측에 도움이 되고자 하였다. **방법:** 2009년 1월부터 2019년 6월까지 ALHL로 진단받았던 58명의 환자들을 대상으로 하였으며, 증상, 혈액검사 및 청력검사 결과, 호전 여부, 재발 여부 등에 대해 후향 적으로 조사하였다. 또한 비교 분석을 위해 환자군과 연령과 나이가 같은 58명의 대조군을 선정하여 혈액검사 결과를 조사하였다. **결과:** 총 58명의 환자군과 58명의 대조군이 연구에 포함되었다. 환자군의 평균연령은 38.0세였고, 이중 남성이 10명, 여성이 48명이었다. 35명의 환자는 입원하여 치료 받았으며 나머지 23명은 통원치료를 받았다. 회복 여부에 따라 분류하면 38명은 완전회복 되었으며, 11명은 부분회복, 9명은 회복되지 않았다. 또한 회 복되었던 환자들 중 16명은 추후 비슷한 증상으로 재발하였다. 대조군과 비교 했을 때 환자군에서 총백혈구수와 호중구수, NLR과 PLR 값은 유의하게 높았다. 환자군 내에서 보면, 통원치료 받았던 군보다 입원치료 받았던 군에서 완전회 복될 가능성이 1.613배 높았으며, 부분회복군에 비해 완전회복군의 환자들 나이가 더 어렸으며 증상시작부터 치료시작까지의 기간이 더 짧았다. 회복 여부에 따라 세 군으로 나누어 분석해보았을 때, NLR, PLR 등을 포함한 혈액검사 상에서 유의한 차이는 없었다. 재발했던 군과 재발하지 않았던 군 사이에도 NLR, PLR 값은 유의한 차이가 없었다. **결론:** 돌발성 난청과 같이 ALHL 환자에서도 NLR과 PLR 값이 대조군에 비해 상대적으로 높았다. 하지만 회복군과 비회복군 사

이에 유의한 차이는 없었으며, 재발 여부와 도 상관관계는 보이지 않았다. 따라서 NLR과 PLR 값은 ALHL의 진단에 도움이 될 수 있으나 예후 예측 인자로서는 그 가치가 떨어진다고 볼수있다.

## OTOP 14

기타 임상

15:40~16:40 • 세미나실3

Chairperson(s) : 변재용(경희의대), 심현준(을지의대)

OTOP-79 15:40~15:50

### AUTOMATED DIAGNOSIS OF EAR DISEASE USING ENSEMBLE DEEP LEARNING WITH A BIG OTOENDOSCOPY IMAGE DATABASE

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF NUCLEAR MEDICINE, YONSEI UNIVERSITY COLLEGE OF MEDICINE

DONGCHUL CHA<sup>1</sup>, CHONGWON PAE<sup>2</sup>, SI-BAEK SEONG<sup>2</sup>, HAE-JEONG PARK<sup>2</sup>, JAE YOUNG CHOI<sup>1</sup>

**목적:** Ear disease can easily be treated by early detection and appropriate medical care. However, short of specialists and relatively low diagnostic accuracy calls for a new way of diagnostic strategy, in which deep learning may play a significant role. The current study presents a machine learning model to automatically diagnose ear disease using a large database of otoendoscopic images acquired in the clinical environment. **방법:** Total 10,544 otoendoscopic images were used to train nine public convolution-based deep neural networks to classify eardrum and external auditory canal features into six categories of ear diseases, covering most ear diseases ( 1: Normal, 2: Attic retrac-



tion, 3: Tympanic perforation, 4: Otitis externa with or without myringitis, 5: Otitis media with effusion, 6: Tumor). After evaluating various optimization schemes, two best-performing models were selected to compose an ensemble classifier, by combining classification scores of each classifier. **결과:** Considering accuracy and training time, transfer learning models based on Inception-V3 and ResNet101 were chosen and the ensemble classifier using the two models yielded a significant improvement over each model, the accuracy of which is in average 93.67% for the 5-folds cross-validation. Considering substantial data-size dependency of classifier performance in the transfer learning, evaluated in this study, the high accuracy in the current model is attributable to the large database. **결론:** The current study is unprecedented in terms of both disease diversity and diagnostic accuracy, which is compatible or even better than an average otolaryngologist. The classifier was trained with data in a various acquisition condition, which is suitable for the practical environment. This study shows the usefulness of utilizing a deep learning model in the early detection and treatment of ear disease in the clinical situation.

**OTOP-80 15:50~16:00**

#### **AUTOMATED DIAGNOSIS OF TYMPANIC MEMBRANE USING CONVOLUTIONAL NEURAL NETWORK- BASED DEEP LEARNING AND COMPARISON ANALYSIS WITH NOVEL MODELS**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, ASAN MEDICAL CENTER  
JIN TAEK PARK, SEUNG-HO CHOI, JONG WOO CHUNG

**목적:** Accurate evaluation of the tympanic membrane (TM) is essential for diagnosis of middle ear disease.

In the previous study, we demonstrated the detection of side and perforation of TMs by using convolutional neural network (CNN) model and confirmed the high-level of accuracies. To improve classification accuracy, we applied other novel and recent deep neural network models. **방법:** A total used images for analyzing the accuracy of perforated TM were with 617 normal and 607 perforated TMs. As the artificial intelligence models, VGG16, Inception V3 and Xception were used for the image analyzing, including previously used CNN6 model. After random assignment of the images to the training, validation and test sets, training was performed. A class activation map (CAM) was used to assess feature extraction. We analyzed the accuracy of distinguishing normal or perforated TMs with each models. **결과:** The test accuracy was 83.7%, 99.7%, 100%, and 90.7% for CNN6, VGG16, Inception V3, and Xception, respectively. We also obtained sensitivity and specificity of each models and the results of applying VGG16 and InceptionV3 were more accurate than those of CNN6 and Xception. **결론:** The trained deep neural model can be used in endoscopic tympanic membrane image diagnosis. We confirmed that the newly applied models show more accurate results compared with the previous CNN model we studied. However, one model is required the optimization of training as a result of considerable inaccuracy. Also, further deep neural researches are necessary on the side and subtle changes of tympanic membrane to improve classification accuracy.

**OTOP-81 16:00~16:10**

#### **KOREAN TRENDS IN OTOLOGIC SURGICAL PROCEDURES, AUDIOLOGIC TESTS AND RELATED MEDICAL COSTS USING NATIONWIDE COHORT DATASET (2010-2018)**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, HALLYM UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT

18월 (금)

본과 및 유관학회 포스터

Education Program

이과 구역 (OTOP)

비과 구역 (RHOP)

두경부 구역 (HNOP)

TPP

OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, KOREA UNIVERSITY COLLEGE OF MEDICINE<sup>3</sup>

SUNG KYUN KIM<sup>1</sup>, SEUNG HA OH<sup>2</sup>, YOON CHAN RHA<sup>3</sup>, GI JUNG IM<sup>3</sup>

**목적:** Understanding trends of national burden of otologic diseases such as hearing loss, variable infectious conditions is important to plan strategies for otologic health care. Aim of this study was to demonstrated recent Korean trends of otologic surgical procedures, audiologic tests and related medical costs using nationwide dataset. **방법:** This observational nationwide study used population-based opened insurance database from Health Insurance Review & Assessment Service and health data for registered disable people and disease-related death rate used from Social Security Information Service and Korea National Statistics. The audiologic test included six of the most frequent tests, and the surgical procedure included eight categories of most frequent neuro-otologic surgeries except the simple procedures. **결과:** The number of patients with hearing loss increased 1.5 times in 2018 compared to 2010, and medical cost due to hearing loss doubled. From 2010, total number of audiologic tests (PTA, SA, Tympanometry, ABR, OAE, Tinnitus test) has increased and PTA, SA were the most common audiologic tests (PTA: 1,780,785, SA: 747,034 in 2018). Furthermore, abrupt increase of audiologic tests 2015–2018 than 2010–2014. Traditional otologic surgeries maintain at a relatively constant level continuing increase and decrease that reflects the decreasing rate and number of patients with COM (mastoidectomy: 10,015, tympanoplasty: 13,892 in 2018, 0.046% in total population). Among auditory rehabilitation surgeries, CI has increased steadily, and MEI and BCD have increased 1–2 years since 2015 but have declined since last year 2018. **결론:** This study provides Korean trends of otologic surgeries, audiologic tests, and

hearing disability in South Korea. The approach of ear health care through analysis of various public data is expected to be able to identify more diverse and macro trends than single big database research that has been studied.

OTOP-82 16:10~16:20

### CHANGES IN THE DEGREE OF AURICULAR PROTRUSION AFTER CHRONIC OTITIS MEDIA SURGERY USING THE RETROAURICULAR APPROACH

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CATHOLIC UNIVERSITY OF DAEGU SCHOOL OF MEDICINE

YEE-HYUK KIM, BYUNG-JUN KANG, BO-MUN KIM, BU-KWAN KIL, SANG-HEUN LEE

**목적:** 만성 중이염 수술에서 후이개 접근법을 이용하였을 때, 수술 후 귓바퀴가 돌출되어 보인다고 호소하는 환자들이 종종 있다. 이것은 후이개 접근법으로 수술을 한 경우에 수술 이후 일정 기간 동안은 이개두개각(auriculocephalic angle)이 증가하게 되어 생기는 현상이다. 본 연구에서는 수술 후 돌출된 귓바퀴가 수술 전 상태로 회복되는지, 회복된다면 수술 후 어느 정도의 기간이 필요한지 알아보고자 하였다. **방법:** 2016년 7월부터 2017년 7월까지 대구가톨릭대학교병원 이비인후과에서 후이개 접근법으로 만성 중이염에 대한 수술(고실성형술, 유양돌기 절제술)을 시행한 환자 47명을 대상으로 전향적으로 연구를 진행하였다. 귓바퀴의 돌출된 정도를 측정하기 위해서 아래의 방법을 이용하였다. 첫번째는 이주(tragus)의 상연과 동일한 높이의 평면상에서, 유양돌기에서부터 이개륜까지의 거리를 측정하였고 이곳은 귓바퀴의 중간 부위에 해당하였다. 두번째는 머리에서부터 이개륜까지의 거리 중 가장 먼 곳을 측정하였으며, 이곳은 귓바퀴의 상부에 해당되었다. 위의 두 곳의 거리는 수술 전, 수술 후 1일, 2주, 그리고 1, 2, 4, 6개월째 측정하였다. **결과:** 위 두 곳의 측정치는 모두 수술 후 1일, 2주 그리고 1개월째는 수술 전보다 통계학적으로 의미 있게 증가하였고, 이 중에서 수술

후 2주째의 측정치가 가장 길었다. 반면에, 수술 후 2, 4, 6개월째는 수술 전과 비교했을 때 통계학적으로 의미 있는 차이는 없었다. **결론:** 후이개 접근법을 이용하여 만성 중이염 수술을 하였을 때, 일시적으로 귓바퀴가 돌출되었다가 수술 후 2개월이 경과하면 수술 전과 비슷해지는 것을 알 수 있었다.

### OTOP-83 16:20~16:30

#### BIG DATA ANALYSIS FOR UNILATERAL HEARING LOSS AND HEARING AID USE IN SOUTH KOREA

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, BUCHEON, KOREA, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

YUN JI LEE<sup>1</sup>, HYUN TAG KANG<sup>1</sup>, SE A LEE<sup>2</sup>, JONG DAE LEE<sup>1</sup>, BO GYUNG KIM<sup>1</sup>

**목적:** A definitive study on the prevalence of adult unilateral hearing loss and hearing aid rehabilitation is lacking. The purpose of our study is to investigate the prevalence of adult unilateral hearing loss and factors associated with hearing aid use in patients with unilateral hearing loss in South Korea. **방법:** We obtained data from 2009 to 2012 Korea National Health and Nutrition Examination Surveys (KNHANES), which was a cross-sectional, nationwide, population-based survey in Republic of Korea. The KNHANES is composed of three different surveys: a health interview survey, physical examination, and nutrition survey. We analyze the prevalence and associated factors of unilateral hearing loss and hearing aid adoption by univariable and multivariable analysis. And we also compared the factors between hearing aid users and non-users. **결과:** From 2009 to 2012, 33,252 individuals participated in the KNHANES. Among them, the number of patients with unilateral hearing loss

was 1632(4.91%) and the prevalence of hearing aid adoption in unilateral hearing loss was 1.48%. Occupational presence(OR 3.750, 95% CI 1.441– 9.763), hearing threshold in the better ear (OR 1.088, 95% CI 1.029– 1.151) and hearing threshold in the worse ear(OR 1.031, 1.005–1.058) were found to affect the adoption of hearing aids among patients with unilateral hearing loss. In comparison of hearing aid users and non-users, noise exposure during work in hearing aid users was significantly lower than hearing aid non-users. **결론:** The prevalence of hearing aid use in patients with unilateral hearing loss in South Korea is very low compared as other countries. Public health education is needed for increased insight and auditory rehabilitation for unilateral hearing loss should be recommended actively.

### OTOP-84 16:30~16:40

#### AUDIOMETRIC RESULTS AFTER CHEMOTHERAPY IN PATIENTS OF HEAD AND NECK CANCERS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNGPOOK NATIONAL UNIVERSITY HOSPITAL, DAEGU, REPUBLIC OF KOREA

DA JUNG JUNG, MYUNG HOON YOO, A YOUNG KIM, KYU-YUP LEE

**목적:** Cisplatin is one of the anticancer drugs used for head and neck cancers. Although some studies have shown that cisplatin can cause ototoxicity, periodic audiometric assessments have not been studied. Hence, this study has been undertaken to evaluate the effects of cisplatin on hearing. **방법:** Seventy-one patients with squamous cell carcinomas of head and neck, who received cisplatin chemotherapy, were recruited. Systemic blood test and audiometry were assessed before and after the first and second chemotherapy cycle. **결과:** The mean age was  $61.2 \pm 10.8$  years old. The

proportion of male gender was 84.5%. Most common type of malignancy was nasopharyngeal cancer in our cohort. All mean hearing threshold values had significant increased after second chemotherapy compared with baseline values for all frequencies. Difference between two time points was greater in high frequencies than in low frequencies. Averaged hearing thresholds in baseline, after first, or second chemotherapy were  $22.2 \pm 13.5$ ,  $23.3 \pm 15.7$ , and  $25.2 \pm 17.3$  dB, respectively. There was significant increase in averaged hearing thresholds after second chemotherapy compared with baseline values ( $P = 0.005$ ). The proportion of patients with hearing loss after second chemotherapy increased as chemotherapy cycles increased.

**결론:** Our study showed that cisplatin was associated with hearing impairment particularly high frequency after first chemotherapy and all frequency after second chemotherapy.

**RHOP 8**

부비동염 기초 II

08:00~09:00 • 세미나실1

Chairperson(s) : 신승훈(대구가톨릭의대), 김동영(서울의대)

**RHOP-43 08:00~08:10****ROLE OF STAPHYLOCOCCAL ENTEROTOXIN B IN NASAL MUCOSAL BARRIER IN CHRONIC RHINOSINUSITIS WITH NASAL POLYP**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, <sup>2</sup>RESEARCH INSTITUTE FOR MEDICAL SCIENCE, CHUNGNAM NATIONAL UNIVERSITY SCHOOL OF MEDICINE, STATE KEY LABORATORY OF RESPIRATORY DISEASE, DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, FIRST AFFILIATED HOSPITAL, GUANGZHOU MEDICAL UNIVERSITY

JUN XU<sup>1,2</sup>, SUN-HEE YEON<sup>1</sup>, MI-RA CHOI<sup>1</sup>, SOO-KYOUNG PARK<sup>1</sup>, YOUNG-HOON YOON<sup>1</sup>, SEUNG-HYEON CHOI<sup>1</sup>, YONG-MIN KIM<sup>1</sup>

**목적:** To investigate the role of staphylococcal enterotoxin B (SEB) in nasal mucosal epithelial barrier in the pathogenesis of chronic rhinosinusitis with nasal polyp (CRSwNP). **방법:** The mRNA and protein expression of tight junction (TJ) and endoplasmic reticulum (ER) stress associated molecules were detected in nasal mucosal tissues from control subjects, CRSsNP patients, and CRSwNP patients. The effects of SEB on nasal mucosal epithelial barrier were investigated with primary human nasal epithelial cells (pHNECs). Murine nasal polyp (NP) model was used for verifying the therapeutic effects of ER stress inhibition. **결과:** Significantly lower protein expression levels of the TJ associated molecules were detected in the nasal mucosal tissues from CRS patients compared to the

nasal mucosal tissues from control subjects, whereas the mRNA and protein levels of the ER stress were showed an opposite expression pattern. Our in vitro study demonstrated that SEB could disrupt the nasal mucosal epithelial barrier integrity by up-regulating of ER stress, while the results of our in vivo study showed that the inhibition of ER stress could effectively reduce the nasal polyp development. **결론:** SEB induced ER stress can lead to nasal mucosal epithelial barrier dysfunction which can make pathogens to pass through the mucosal epithelial barrier more easily, and these could lead to CRSwNP.

**RHOP-44 08:10~08:20****THE MELANOCORTIN ACTH PROMOTES MYOFIBROBLAST DIFFERENTIATION IN NASAL POLYP-DERIVED FIBROBLASTS THROUGH THE MELANOCORTIN RECEPTOR SIGNALING PATHWAY**

<sup>1</sup>THE AIRWAY MUCUS INSTITUTE, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>KOREA MOUSE PHENOTYPING CENTER, <sup>4</sup>MEDICAL RESEARCH CENTER, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>5</sup>GLOBAL RESEARCH LABORATORY FOR ALLERGIC AIRWAY DISEASES

SANG-NAM LEE<sup>1</sup>, JONG-GYUN HA<sup>2</sup>, PARK JEONG JIN<sup>2</sup>, JAE-SUNG NAM<sup>2</sup>, HYUNG-JU CHO<sup>1,2</sup>, CHANG-HOON KIM<sup>1,2,3,4</sup>, JOO-HEON YOON<sup>1,2,3,5</sup>

**목적:** Nasal polyp is a chronic inflammatory disease characterized by inflammatory cell accumulation and abnormal fibroblast proliferation. Nasal fibroblasts differentiate into myofibroblasts that express  $\alpha$ -smooth muscle actin ( $\alpha$ -SMA) and subsequently produce extracellular matrix (ECM) components in the process of NP formation. Proopiomelanocortin (POMC)-derived peptides including adrenocorticotrophic hormone (ACTH) has been shown to be associated with the development of nasal polyp (NPs).

The aim of this study was to investigate the effects of ACTH on myofibroblast differentiation in nasal polyp-derived fibroblasts (NPDFs). **방법:** NPs were collected during surgery and the secretory granules was isolated from surgical tissues by Percoll gradient centrifugation. NPDFs were isolated from NPs and cultured cells were stimulated with 5 nM ACTH for 48 h. Expression and distribution of POMC, ACTH, proprotein convertase 1 (PC1), melanocortin receptors (MCRs), chromogranin A (CgA), and  $\alpha$ -SMA were determined by RT-PCR, western blotting, and immunofluorescent staining. **결과:** The expression levels of ACTH,  $\alpha$ -SMA, and PC1 (a POMC processing enzyme) were significantly higher in nasal polyps compared to control tissues. ACTH colocalized with PC1 and CgA in secretory granules isolated from NPs. NPDFs expressed MC-1R, -2R, and -5R at the mRNA and protein levels. Treatment with ACTH induced  $\alpha$ -SMA expression in NPDFs. In addition, the effect of ACTH on myofibroblast differentiation was reversed by function-blocking antibodies for MC-1R, -2R, and -5R. **결론:** Taken together, our results suggest that ACTH might be involved in the development of NPs by promoting myofibroblast differentiation and ECM production in NPDFs by activating melanocortin receptor signaling pathway.

**RHOP-45 08:20~08:30**
**ALTERED EXPRESSION OF EPHRIN A2 RECEPTOR AND EPHRIN A1 AXIS IN CHRONIC RHINOSINUSITIS AND THEIR CONTRIBUTION TO INNATE AND ADAPTIVE IMMUNE RESPONSE**

DEPT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, COLLEGE OF MEDICINE, KOREA UNIVERSITY

YOUNG CHAN KIM, HO YOUNG LEE, KI JEONG LEE, TAE HOON KIM, SANG HAG LEE

**목적:** Eph receptor tyrosine kinase have a wide range

of biological function and have gradually been recognized increasingly as key regulators of inflammation. However, the present study is to investigate the role of Ephrin A2 receptor/Ephrin A1 ligand axis in chronic rhinosinusitis. **방법:** Sinonasal mucosa was obtained from healthy control and patients with CRS with or without nasal polyps and used to evaluate the expression levels of ephrin A2 receptor and ephrin A1 with real time PCR, western blot, and immunohistochemistry. Cultured epithelial cells were used to evaluate the epithelial permeability and transepithelial electrical resistance, expression of ephrin A2 receptor and ephrin A1 after treatment with Toll-like receptor agonists and ephrin A1, in ephrin A2 receptor knock-downed cells. **결과:** The expression levels of Ephrin A2 receptor and Ephrin A1 were increased in inflammatory sinus mucosa, compared with normal sinus mucosa where they are commonly distributed in superficial epithelial cells, submucosal glands, and vascular endothelium. Toll like receptor 3 and 7 agonist induced the increased expression of ephrin A2 receptor and ephrin A1. Ephrin A1 stimulation results in increased epithelial permeability associated with decreased transepithelial electrical resistance which were accompanied by decreased junctional complex protein including ZO-1, ZO-2 and occludin. **결론:** The present study showed that ephrin A2 receptor /ephrin A1 distributed in epithelial cell layer increased in cells stimulated with Toll like 3 and 7 agonists, participating in dysfunctional epithelial permeability. The present data suggest that ephrin A2 receptor /ephrin A1 axis may play a role in the innate and adaptive immunity.

**RHOP-46 08:30~08:40**
**INTERLEUKIN (IL)-13 AND IL-17A CONTRIBUTE TO NEO-OSTEOGENESIS IN CHRONIC RHINOSINUSITIS BY INDUCING RUNX2**

<sup>1</sup>OBSTRUCTIVE UPPER AIRWAY RESEARCH (OUAR)

LABORATORY, DEPARTMENT OF PHARMACOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA <sup>2</sup>DEPARTMENT OF BIOMEDICAL SCIENCES, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA <sup>3</sup>ISCHEMIC/HYPOXIC DISEASE INSTITUTE, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA <sup>4</sup>CANCER RESEARCH INSTITUTE, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA <sup>5</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL, KOREA <sup>6</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL METROPOLITAN GOVERNMENT-SEOUL NATIONAL UNIVERSITY BORAMAE MEDICAL CENTER, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

ROZA KHALMURATOVA<sup>1</sup>, DAE WOO KIM<sup>6</sup>, JONG-WAN PARK<sup>1,2,3,4</sup>, HYUN-WOO SHIN<sup>1,2,3,4,5,6</sup>

**목적:** There is increasing evidence supporting the impact of neo-osteogenesis in the pathophysiology of chronic rhinosinusitis (CRS), especially in the recalcitrant group of patients. Runt-related transcription factor 2 (RUNX2), a member of the RUNX family, controls osteoblast differentiation and bone formation. However, the role and regulation of RUNX2 in CRS patients with neo-osteogenesis remain unclear. The aim of the study is to determine the role of RUNX2 in neo-osteogenesis of CRS patients. **방법:** Sinonasal bone and overlying mucosa samples were obtained from CRS patients with or without neo-osteogenesis (n = 67) and healthy controls (n = 11). Double immunofluorescence, immunohistochemistry, and immunoblotting were used to evaluate RUNX2 expression in CRS patients with and without neo-osteogenesis. In addition, the osteogenic activity of pro-inflammatory cytokines was examined by measuring alkaline phosphatase (ALP) activity and bone mineralisation in vitro. **결과:** RUNX2 was highly expressed in osteoblasts of CRS patients with neo-osteogenesis compared

with tissues from control subjects and those with CRS without neo-osteogenesis. Mucosal extracts from CRS patients with neo-osteogenesis showed increased RUNX2 expression and ALP activity in C2C12 cells, whereas those from patients without neo-osteogenesis did not. Expression of interleukin (IL)-13 and IL-17A was upregulated in CRS patients with neo-osteogenesis. ALP activity and Alizarin Red staining showed IL-13 and IL-17A dose-dependent osteoblast differentiation and mineralisation in vitro. **결론:** These findings suggested that IL-13- or IL-17A-induced RUNX2 contributed to new bone formation in CRS patients through its effect on the activity of osteoblasts. RUNX2 may be a novel target for preventing neo-osteogenesis in CRS patients.

**RHOP-47 08:40~08:50**

#### **PURIFICATION AND CHARACTERIZATION OF MICRORNAS WITHIN EXTRACELLULAR VESICLES FROM NASAL LAVAGE FLUID**

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SEUNGBIN CHA<sup>1</sup>, EUN-HYE SEO<sup>1</sup>, KYUJIN HAN<sup>2</sup>, HYUNJOO NAHM<sup>2</sup>, YE JIN KANG<sup>1</sup>, JI EUN KIM<sup>1</sup>, SEUNG HYUN LEE<sup>1,3,4</sup>, JIN KOOK KIM<sup>2,3,4</sup>

**목적:** Extracellular vesicles (EV) are nanovesicles of endocytic origin released by cells and present in human body fluids such as plasma, breast milk, and bronchoalveolar lavage fluid. These vesicles take part in communication between cells. Recently, it was shown that EVs contain both mRNA and microRNA. This RNA can be shuttled between cells, which

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(OTOP)

비과 구역  
(RHOP)

두경부 구역  
(HNOP)

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is a new route of communication between cells. The aim of this study was to determine whether nasal secretions harbor EVs and furthermore, whether these EVs contain RNA. **방법:** Extracellular vesicles were isolated from nasal lavage(NAL) fluid using sequential centrifugation, and Immunocytochemical staining and flow cytometry were used to characterize and identify expression markers of EV. RNA was also isolated from NAL fluid-EV. The isolated RNA was analyzed for the whole microRNA through the Affimetrix® microarray analysis method. **결과:** EVs were visualized as 40–150 nm, CD9+, CD63+ vesicles using EM and confocal microscope. The CD9 + CD63 + expression marker pattern of NAL fluid-EV was different from that derived from bronchoalveolar lavage (BAL) fluid. In addition, NAL fluid-EV expression was different depending on the CRS without NP and with NP. Six upregulated miRNAs and 52 downregulated miRNA were differentially expressed( $p < 0.05$ , fold change  $> 2$ ) in NAL fluid-EV of CRS vs HC. In addition 22 upregulated miRNA and 1 downregulated miRNA were differentially expressed( $p < 0.05$ , fold change  $> 2$ ) in NAL fluid-EV of CRSwNP vs CRSsNP. Utilizing the Kyoto Encyclopedia of Genes and Genomes database (KEGG), which is an online database for pathway mapping, upregulated miRNAs in the CRSwNP group have a significant correlation in hippo signaling pathway, TGF- $\beta$  signaling pathway, and lysin degradation pathway. **결론:** To our knowledge, this the first report demonstrating the presence and difference of EV miRNAs between CRS and healthy controls. These findings open a broad and novel area of research in CRS pathophysiology as driven by miRNA cell communication

## TRIX PRODUCTION VIA TGF- $\beta$ 1 SIGNALING PATHWAYS IN SINONASAL FIBROBLASTS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY, COLLEGE OF MEDICINE, SEOUL, KOREA

JOO-HOO PARK, JAE-MIN SHIN, JONG-GEUN LEE, HYUN-WOO YANG, IL-HO PARK, HEUNG-MAN LEE

**목적:** Cigarette smoke may be one of the factors aggravating CRS. The aims were to investigate the effects of CSE on myofibroblast differentiation and extracellular matrix production and to investigate the underlying mechanisms of CSE in sinonasal fibroblasts. **방법:** Fibroblasts were stimulated with CSE. Cytotoxicity was evaluated by MTT assay. The expression level of  $\alpha$ -smooth muscle actin, fibronectin, and collagen type 1 was measured by real-time PCR, western blotting, and immunofluorescence staining. The expression level of TGF- $\beta$ 1 and its receptors were determined by real-time PCR and/or ELISA. Activation of ROS was analyzed by using DCFH-DA, mitosox red and amplex red assay. MAPKs, AP-1 and Smad2/3 activations were determined by using western blot and/or immunofluorescence staining. **결과:** CSE had no significant cytotoxic effect of up to 5%. CSE increased mRNA and protein expressions of ECM markers. The antagonist of TGF- $\beta$ 1 receptor suppressed CSE-induced expressions of ECM markers. Also, CSE induced ROS production, activations of MAPK, AP-1, and Smad2/3. Pretreatment with ROS scavengers, specific inhibitors of MAPK, AP-1, and Smad2/3 significantly decreased CSE-induced ECM marker expressions. **결론:** CSE promotes extracellular matrix production via TGF- $\beta$ 1 receptor/MAPK/AP-1 and Smad2/3 pathways. Therefore, cigarette smoke may aggravate the development of CRS.

RHOP-48 08:50~09:00

CIGARETTE SMOKE EXTRACT PROMOTES FIBROBLAST ACTIVATION AND EXTRACELLULAR MA-



**RHOP 9****수면장애 II**

08:00~09:00 • 세미나실3

Chairperson(s) : 구수권(부산성모병원), 박찬순(가톨릭의대)

**RHOP-49 08:00~08:10****PREDICTION OF SLEEP APNEA BY USING SMARTPHONE RECORDED WHOLE NIGHT SLEEP BREATHING SOUND**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>BIGDATA CENTER, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL, <sup>3</sup>MUSIC AND AUDIO RESEARCH GROUP, GRADUATE SCHOOL OF CONVERGENCE SCIENCE AND TECHNOLOGY, SEOUL NATIONAL UNIVERSITY

SUNG-WOO CHO<sup>1</sup>, JIN HO SHIN<sup>2</sup>, SUNG JAE JUNG<sup>2</sup>, KYOGU LEE<sup>3</sup>, JEONG-WHUN KIM<sup>1</sup>

**목적:** Previously we have developed an algorithm to predict obstructive sleep apnea(OSA) from breathing sound during sleep. To develop a smartphone app, sound recording should be done in the mobile setting. Therefore, in this study, we validated smartphone recorded breathing sound during sleep to predict OSA. **방법:** Audio recordings during sleep were performed using a smartphone during polysomnography. Breathing sounds recorded from all sleep stages were analyzed. After noise reduction preprocessing, means, standard deviation, and derivatives of representative sound features were selected as a dependent attributes and measured apnea hypopnea index were used as an independent attribute. Machine learning was performed with Python 3.7 with SciKit-Learn[ ] libraries. Data were spit into training and test dataset by using sklearn.train\_test\_split. Synthetic minority over-sam-

pling technique balancing method was used to introduce a balance in the training sets. 10 fold cross validation was performed from the training dataset to develop a final model. This final model was then validated with the test set. Binary classifications were separately conducted for two different threshold criteria of apnea hypopnea index (AHI) of 15, or 30. **결과:** In total 283 patients were analyzed. Patients were grouped according to OSA severity; Normal (N=28, mean AHI 2.3), Mild (N=52, mean AHI 9.3), Moderate (N=69, mean AHI 21.6), and Severe (N=134, mean AHI 55.4). In binary classification at AHI 15, accuracies from random forest and Xgboost, were 0.773 and 0.839 respectively. Area under curve(AUC) s were 0.865 and 0.905, respectively. In binary classification at AHI 30, accuracies were 0.814 and 0.778 and AUCs were 0.831 and 0.852, respectively. **결론:** Prediction of obstructive sleep apnea using smartphone recorded sleep breathing sound had been validated. With development of sound feature extraction and machine learning in the mobile setting, prescreening of OSA with mobile device seems to be feasible.

**RHOP-50 08:10~08:20****THE CLINICAL CHARACTERISTICS OF EPIGLOTTIS COLLAPSE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL AND CHONNAM NATIONAL UNIVERSITY HOSPITAL, GWANGJU, SOUTH KOREA

HEE-YOUNG KIM, SE-HYUN JEONG, CHUNG-MAN SUNG, SANG-CHUL LIM, HYUNG-CHAE YANG

**목적:** 최근 약물유도수면상기도내시경(DISE, drug-induced sleep endoscopy)으로 후 두뒹개로 인한 상기도 폐쇄 발견 빈도가 증가하였고, 이것이 지속기도양압기(CPAP, Continuous positive airway pressure)치료 실패

의 중요한 원인 중 하나로 주목받고 있다. 하지만 DISE를 시행하기 전에 후두덮개로 인한 폐쇄를 예측하는 것이 쉽지 않으며, 이에 대한 연구는 시행된 것이 없다. 이에 본 저자들은 DISE를 시행 후 후두덮개로 인한 상기도폐쇄가 있는 환자들과 없는 환자들의 임상적 특징들을 비교해 보았다. **방법:** 2015년 1월부터 2019년 3월까지 수면 무호흡 및 코골이를 주소로 본원에 내원하여 DISE를 시행한 환자들 중, 후두덮개 폐쇄를 보인 환자군과 후두덮개 폐쇄가 없는 환자들을 대상으로 나이-성별에 따른 사례조절연구 (Age-sex matched case control study)를 시행하였다. 최초 내원시에 기저질환 유무, 키, 몸무게를 조사 했고 모든 환자에서 수면다원검사 혹은 간이형 수면다원검사를 시행하였다. DISE는 VOTE classification을 이용하여 환자를 평가하였으며 하악전인 및 두부 회전을 함께 시행하여 치료 효과를 예측하고자 하였다. **결과:** 후두덮개 폐쇄 환자군과 비폐쇄 환자군간에 나이, 성, 고혈압, 당뇨 유병률에 차이는 없었다. 뇌혈관질환의 유병률은 후두덮개 비폐쇄 환자군에서, 관상동맥질환의 유병률은 폐쇄 환자군에서 더 높게 나왔으나 유의한 차이를 보이지 않았다. 하지만, 체질량 지수는 폐쇄 환자군에서 유의하게 낮았다. 또한 수면다원검사상에서 무호흡-저호흡지수 (AHI), SpO2 time<90% index는 폐쇄 환자군에서 저명하게 낮았다. DISE상에서는 비폐쇄 환자군에서 구인두 측면 폐쇄 및 연구개 측면 폐쇄 비율이 더 높게 나타났다. DISE중 폐쇄 환자군에 하악전인을 시행하였을 때 106명 중에 98명이 호전되었고, 두부회전을 시행하였을 때는 우측회전시에는 75명, 좌측 회전시에는 77명이 호전되었다. **결론:** 후두덮개 폐쇄가 있는 환자의 비율은 이전에 알려진 것보다 높게 측정되었으며, 없는 환자와 비교하였을 때 나이, 성별, 기저질환에는 차이가 없었지만, BMI 및 AHI가 유의하게 낮았고 구강내 장치의 치료효과가 좋을 것으로 판단되었다. 따라서 비교적 BMI수치가 낮고 증상에 비해서 수면다원검사상에서 낮은 AHI수치를 보이는 환자에서 CPAP에 효과가 없는 경우 DISE를 통하여 후두덮개 폐쇄의 유무를 확인하는 것이 필요할 수 있다.

## EFFECT OF UPPER AIRWAY SURGERY ON SNORING AS SEVERITY OF OBSTRUCTIVE SLEEP APNEA IN ADULT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE, KOREA UNIVERSITY ANSAN HOSPITAL

SUN JIN HWANG, MIN KYU LEE, SEONGBIN PARK, MUN SOO HAN, MIN YOUNG SEO, SEUNG HOON LEE

**목적:** Obstructive sleep apnea is characterized by symptoms such as daytime sleepiness, fatigue, snoring, choking and gasping in sleep and frequent arousal during sleep. Treatment of obstructive sleep apnea is based on the apnea-hypopnea index measured by polysomnography and possibility of correction for structural abnormalities. In practice, however, patients who visit the hospital most common complain of snoring and they are interested in reduction of snoring as well as improvement of AHI. The aim of this study was to evaluate the effect of upper airway surgery on snoring and AHI in adult patients with obstructive sleep apnea. **방법:** From 2005 to 2015, 104 patients who visited our hospital with snoring and diagnosed with obstructive sleep apnea were treated with upper airway surgery. All of them measured objective snoring (% duration) and subjective snoring scale through the polysomnography and questionnaire before and 3 months after surgery. **결과:** After surgical treatment, the degree of objective snoring tended to decrease, but this was not statistically significant ( $p = 0.24$ ). When the groups were classified according to the severity of obstructive sleep apnea, the degree of objective snoring in the mild and moderate obstructive sleep apnea group was significantly decreased ( $p = 0.02$ ,  $p = 0.01$ ). In the severe obstructive sleep apnea group, snoring increased after surgery, but this was not statistically significant ( $p = 0.32$ ). In addition, as the initial ap-

nea-hypopnea index was higher, the improvement of snoring tended to decrease ( $r = -0.35$ ,  $p = 0.00$ ). Subjective snoring scale (symptom) decreased significantly after the surgery ( $p = 0.00$ ), which showed the same result in all three groups of obstructive sleep apnea ( $p = 0.03$ ,  $p = 0.00$ ,  $p = 0.00$ ). In addition, the change of snoring according to the type of surgery was not significant ( $p = 0.75$ ), and the change of snoring according to the result of surgery was only significant in the cure group ( $p = 0.00$ ). **결론:** In patients with obstructive sleep apnea, surgical treatment may be thought to play a role in alleviating the disease by reducing the apnea-hypopnea index even though it does not cure obstructive sleep apnea. However, in terms of snoring, patients with mild or moderate obstructive sleep apnea improve snoring, but patients with severe obstructive sleep apnea tend to worsen snoring after surgery. Therefore, it is necessary to recognize and explain this fact when considering the upper airway surgery.

#### RHOP-52 08:30~08:40

### EVALUATION OF DISE, CEPHALOMETRY AND POLYSOMNOGRAPHY TO IDENTIFY PREDICTOR FOR OUTCOME OF SLEEP SURGERY

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JI-EUN CHOI, YANG-SUB NOH, SANG-DUK HONG, HUN-JONG DHONG, SEUNG KYU CHUNG, HYU YEOL KIM

**목적:** The aim of the present study was to evaluate the role is to investigate drug induced sleep endoscopy (DISE), Polysomnography and cephalometric measurements as a predictor for the outcome of multilevel surgery for obstructive sleep apnea (OSA). **방법:** This prospective study enrolled subjects with OSAS, who

had taken polysomnography and DISE. The subjects were divided into 2 groups according to outcome of sleep surgery i.e., the success and the failure group. The association of surgical outcome with DISE, Polysomnography, Cephalometric findings were evaluated. **결과:** Total 59 patients were enrolled. In subgroup analysis, clinical characteristics including sex, age, BMI were not different between success and failure groups. In success group, tonsil enlargement (preoperative exam) were more prominent compared to failure group and oropharynx obstruction grade (VOTE) was higher significantly. On the contrary, the failure group exhibited higher velopharynx grade (VOTE) with statistical significance ( $p=0.01$ ). In multivariate analysis, velopharynx grade (OR (95 % CI) = 0.34 (0.14–0.81),  $P = 0.01$ ), Oropharynx grade (VOTE) (OR (95 % CI) = 54.52 (4.91–604.8),  $P < 0.01$ ), CT90 above 0.4 (OR (95 % CI) = 0.01 (0.01–0.15),  $P < 0.01$ ) showed statistical significance. **결론:** Preoperative findings including DISE, polysomnography could be a useful predictor of the therapeutic response to multilevel sleep surgery. Comprehensive understanding of their various findings may be helpful in preoperative counseling. This study might contribute to the selection of surgical candidacy for OSAS to improve overall outcome of sleep surgery.

#### RHOP-53 08:40~08:50

### COMPUTATIONAL ANALYSIS OF AIRFLOW DYNAMICS FOR PREDICTING COLLAPSIBLE SITES AND SEVERITY OF SLEEP APNEA VIA MACHINE LEARNING APPROACH

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF MECHANICAL ENGINEERING, YONSEI UNIVERSITY, <sup>3</sup>DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY, YONSEI UNIVERSITY, <sup>4</sup>DEPARTMENT OF ORTHODONTICS, THE INSTITUTE OF CRANIOFACIAL DEFORMITY, YONSEI UNIVERSITY, <sup>5</sup>THE AIRWAY MUCUS INSTITUTE, YONSEI

UNIVERSITY COLLEGE OF MEDICINE

SEUNG HO YEOM<sup>2</sup>, JI SUNG NA<sup>2</sup>, HWI-DONG JUNG<sup>3</sup>,  
YOON JEONG CHOI<sup>4</sup>, JOON SANG LEE<sup>2</sup>, JAE SUNG  
NAM<sup>1</sup>, CHANG-HOON KIM<sup>1,5</sup>, JOO-HEON YOON<sup>1,5</sup>,  
HYUNG-JU CHO<sup>1,5</sup>

**목적:** Obstructive sleep apnea (OSA) is a common sleep breathing disorder characterized by repeated collapse of the upper airway during sleep. Computational fluid dynamics (CFD) has been widely used to investigate the fundamental mechanisms inside airways. We investigated the relationship between airway geometry and aerodynamic characteristics to predict collapsible sites and severity of OSA using machine learning approach. **방법:** Based on computed tomography data from patients, four main geometric parameters were selected from 55 patients. We created a predictive model using Gaussian process regression (GPR) through a dataset obtained through CFD and finite element analysis (FEA). In addition, we developed predictive models based on flow factors affecting upper airway obstruction. In GPR, a squared exponential kernel function was used. Support vector machine (SVM) model was used to determine the degree of OSA of a patient as normal-mild and moderate from GPR model. **결과:** Total 160 samples were modeled and simulated. In these ideal models, we chose the geometry which had the highest airway resistance for the grid test. Our simulation model demonstrated collapsibility in the upper airway was more likely to occur in velopharynx and indicated lowest and highest airway resistance. The results demonstrated that the mean accuracy of the overall GPR model was 37 approximately 72% with respect to the CFD results for the realistic upper airway model. A support vector machine model was also used to identify the degree of OSA patients as normal-mild and moderate/severe. We achieved an accuracy of 82.5% with the training dataset and an accuracy of 80% with the test dataset. **결론:** The use the Gaussian process regression and

support vector machine, a type of machine learning algorithm, was successful to predict flow characteristics quickly and to determine the severity of OSA.

RHOP-54 08:50~09:00

### THERAPEUTIC OUTCOME AND CLINICAL EFFICACY OF TONGUE BASE REDUCTION IN OSA PATIENTS WITH RETROGLOSSAL AREA NARROWING

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL NATIONAL UNIVERSITY HOSPITAL<sup>1</sup>

GENE HUH<sup>1</sup>, JEONG-YEON JI<sup>1</sup>, HEONJEONG OH<sup>1</sup>,  
SUYEON PYO<sup>1</sup>, DONG-YOUNG KIM<sup>1</sup>, CHAE-SEO  
RHEE<sup>1</sup>, HYUN JIK KIM<sup>1</sup>

**목적:** Tongue base (TB) narrowing is a significant site of upper airway collapse during sleep in obstructive sleep apnea (OSA) and diverse technologies are expected to have promising clinical utility in OSA patients with TB narrowing. We intended to evaluate the therapeutic outcomes of tongue base reduction (TBR) using coblation and robot-assisted techniques to assess its clinical effectiveness in OSA patients with retroglossal obstruction due to tongue base collapse. **방법:** TBR was performed to 92 patients diagnosed with OSA in Seoul National University Hospital from 2015 to 2018. 46 patients (median age 38.6, BMI: 24.3) presenting postoperative polysomnography (PSG) were enrolled. Their medical records including PSG, endoscopic findings, change of subjective symptoms, post-operative complications were reviewed retrospectively. **결과:** TBR was performed in patients with moderate to severe OSA or over grade II retroglossal narrowing under sleep endoscopy. The success rate of TBR was analyzed comparing the pre- and postoperative sleep parameters of the 46 patients with both records available. Coblator was used in 33 patients (71.7%) and transoral robotic surgery (TORS) was

performed in 13 patients (28.3%). The success rate of TBR was 47.8%, and 65.2% of the patients showed over 25% improvement in AHI. The success rate was 45.5% for coblator TBR and 53.8% for TORS, but the difference due to surgical method was not significant. Pre-operative AHI varied from 4.9 to 86.4 (median: 40.3) and postoperative AHI decreased to median value of 21.9 ( $P<0.001$ ). Apnea index also improved from median value of 19.2 to 6.7 ( $p=0.024$ ), and lowest SpO<sub>2</sub> increased from preoperative median value of 79.0% to 83.5% postoperatively ( $p=0.002$ ). Total sleep time, and REM percentage did not significantly improve after tongue base reduction but subjective symptoms including daytime sleepiness, snoring intensity, degree of apneic events were improved following TBR. There were minimal postoperative complications such as pain or bleeding in 92 patients and few patients complained of subtle taste loss. **결론:** Our clinical experience of TBR using coblation and robot-assisted TB surgery seems to be a promising surgical technique to improve retroglossal area narrowing in OSA patients and is a favorable surgical option for OSA patients with tongue base collapse.

## RHOP 10

### 알레르기 기초 II

09:00~10:00 • 세미나실1

Chairperson(s) : 윤주현(연세의대), 김용대(영남의대)

**RHOP-55 09:00~09:10**

**THE TNF FAMILY MOLECULES LIGHT AND LYMPHOTOXINS IN ALLERGIC RHINITIS AND THEIR CONTRIBUTION TO CHEMOKINE SECRETION, EPITHELIAL AND ENDOTHELIAL BARRIER DYSFUNCTION**

## TION IN NASAL MUCOSA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, COLLEGE OF MEDICINE, KOREA UNIVERSITY, SEOUL, SOUTH KOREA

YOUNG CHAN KIM, HO YOUNG LEE, KI JEONG LEE, TAE HOON KIM, SANG HAG LEE

**목적:** Tumor necrosis factor-superfamily (TNFSF, LIGHT) members, lymphotoxin- $\alpha$  and - $\beta$  are proinflammatory cytokines associated with a primary driver of inflammatory activity as well as tissue remodeling that is characteristics of chronic inflammatory diseases, such as asthma, rheumatoid arthritis, and inflammatory bowel diseases. Allergic rhinitis is a chronic inflammatory disease characterized by varying degrees of nasal obstruction, nasal hyperreactivity and nasal mucosal remodeling, involving infiltration of the nasal mucosa by a variety of cells including eosinophils and T lymphocytes. The present study aims to investigate the role of LIGHT, lymphotoxin and their receptor in allergic rhinitis. **방법:** We evaluated the expression of TNF superfamily molecule (LIGHT), lymphotoxin beta receptor, HVEM in normal and allergic nasal mucosa. In cultured cells stimulated with LIGHT, the expression of chemokines, epithelial permeability and endothelial permeability were measured. **결과:** The expression levels of LIGHT was increased in allergic nasal mucosa, compared with normal healthy mucosa. Lymphotoxin beta receptor and HVEM were localized to the epithelial cells and endothelial cells. LIGHT, lymphotoxin - $\alpha$  and - $\beta$  induced increased epithelial and endothelial permeability, decreased transepithelial and transendothelial cells electrical resistance **결론:** the present results showed that LIGHT, HVEM, and lymphotoxin beta receptor were expressed in normal nasal mucosa and their levels are increased in allergic nasal mucosa. These results suggest that LIGHT and lymphotoxins may participate in the pathogenesis of allergic rhinitis, contributing to the chemokine production, epithelial and endothelial

permeability.

#### RHOP-56 09:10~09:20

### DEVELOPMENT OF NON-INVASIVE QUANTIFYING METHODS FOR ALLERGIC RHINITIS USING OPTICAL ANALYSIS IN NASAL ENDOSCOPY - PILOT STUDY

DEPARTMENT OF OTORHINOLARYNGOLOGY, SOON CHUN HYANG UNIVERSITY HOSPITAL, GUMI  
YOUNG-JOON JUN

**목적:** Allergic rhinitis (AR) is clinically prevalent disease. Clinically, AR is characterized by difficult to treat, prone to recur, and unclear to diagnosis. AR diagnosis include history taking and nasal endoscopy. Blood test and skin prick test are also helpful to diagnosis. but some is expensive, invasive test and difficulty to assess treatment effect. Nasal mucosal state is frequently observed in ENT clinics. Nasal mucosal change is one of important information to treat (pale mucosa). But there was lack of quantifying methods. The aim of this study is 1) to investigate market research, previous patents and recent tech-flow and 2) to measure and quantify the nasal endoscopy image via optical analysis and compare it to those in AR patients. **방법:** Market and related scientific patents were investigated. Recent tech-flow and medical devices for allergic rhinitis were reviewed. Optical analysis in AR patients performed using nasal endoscopy image. HSV (hue saturation value) estimated for pale mucosa. HSV in nasal endoscopy image analyzed at inferior turbinate. Clinical value obtained from visual analogue scale and allergic rhinitis questionnaire. Morphology analysis performed to evaluate nasal obstruction. Edge sharpness was estimated from nasal septum to inferior turbinate edge. Each quantification data was analyzed with clinical value. **결과:** Global market of allergic rhinitis was about \$ 23 billion in

2017, and increased by 4.5% annually. Scientific patents increased sharply after 2015, but assess/diagnosis patents were weak part. Pale quantification of nasal mucosa and edge sharpness of nasal obstruction correlated with clinical values. **결론:** Optical analysis of nasal endoscopy image might be adjunctive imaging technique for non-invasive measurement methods for allergic rhinitis. Further studies are needed to assess these new methods.

#### RHOP-57 09:20~09:30

### NASAL COMMENSAL *STAPHYLOCOCCUS* SPECIES MODULATES THE EPITHELIAL CELL-DE-RIVED T HELPER 2 (TH2) CYTOKINE-DEPENDENT IMMUNE RESPONSES IN THE ALLERGIC NASAL MUCOSA

DEPARTMENT OF OTORHINOLARYNGOLOGY, GYEONGSANG NATIONAL UNIVERSITY HOSPITAL<sup>1</sup>, DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE<sup>2</sup>, DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY HOSPITAL<sup>3</sup>

YUNG JIN JEON<sup>1</sup>, CHAN HEE GIL<sup>2</sup>, JINA WON<sup>2</sup>, ARA JO<sup>3</sup>, HYUN JIK KIM<sup>2,3</sup>

**목적:** *Staphylococcus* species are the most abundant dominant commensal bacteria of the human nasal mucosa. We investigated the difference in commensal microbiome between normal and allergic nasal mucosa. We aimed to determine the role of the nasal commensal *Staphylococcus* species and to prove the relationship with T helper 2 (Th2) cytokine-dependent immune responses in the allergic nasal mucosa. **방법:** Two commensal *Staphylococcus* species, *Staphylococcus epidermidis* and *Staphylococcus aureus*, were isolated from the nasal mucosa of the allergic rhinitis patients (AR-SE and AR-SA, respectively). We used the *in vitro* normal and allergic human nasal

epithelial cell (NHNE and ARNE) culture system. We measured the changes of nasal epithelium-derived Th2 cytokines expression. The effects of nasal commensal *Staphylococcus* species were also tested in the in vivo ovalbumin (OVA)-driven AR murine model. **결과:** The relative proportion of *S. aureus* in the nasal mucosa-derived bacteria was higher in the AR than normal. Exposure of ARNE cells to *AR-SA* decreased IL-33 mRNA and secreted protein levels. However, when ARNE was exposed to *AR-SE*, IL-33 mRNA and secreted protein levels were not attenuated. In the in vivo OVA-AR model, allergic symptoms and total IgE levels of serum were downregulated significantly after intranasal delivery of *AR-SA*. *AR-SA* decreased IL-33 mRNA and secreted protein levels, and FACS analysis also confirmed the decreased expression of group 2 innate lymphoid cells after exposure to *AR-SA*. On the other hand, the in vivo OVA-AR model with intranasal delivery of *AR-SE* showed no significant changes. **결론:** Our findings indicate that *AR-SA* may mediate the anti-allergic immune response, but *AR-SE* may not have the significant effect. We can suggest that nasal commensal *Staphylococcus* species, especially *AR-SA*, enhance anti-allergic immune responses.

**RHOP-58 09:30~09:40**

#### SCREENING AND FUNCTIONAL PATHWAY ANALYSIS OF PULMONARY GENES ASSOCIATED WITH SUPPRESSION OF ALLERGIC AIRWAY INFLAMMATION BY ADIPOSE STEM CELLS-DERIVED EXTRACELLULAR VESICLES

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY AND BIOMEDICAL RESEARCH INSTITUTE, PUSAN NATIONAL UNIVERSITY HOSPITAL, BUSAN, REPUBLIC OF KOREA

SUNG-DONG KIM<sup>1</sup>, SHIN AE KANG<sup>2</sup>, SUE-JEAN MUN<sup>3</sup>, HAK SUN YU<sup>2</sup>, KYU-SUP CHO<sup>1</sup>, HWAN-JUNG ROH<sup>3</sup>

**목적:** The nanosized vesicles secreted from the various cell types into the surrounding extracellular space are called extracellular vesicles (EVs). Although stem cell-derived EVs are known to promote regeneration of damaged tissues, there is no report that evaluates the immune-modulating effects of adipose stem cells (ASCs)-derived EVs in asthmatic mice. The study aimed to evaluate the differentially expressed genes (DEGs) of lung associated with suppression of allergic airway inflammation by ASCs-derived EVs. **방법:** C57BL / 6 mice were sensitized to ovalbumin (OVA) by intraperitoneal injection and challenged intranasally with OVA. To evaluate the effect of ASCs-derived EVs on allergic airway inflammation, 10 ug/50 ul of ASCs supernatant (sup) or EVs were administrated intranasally before OVA challenge. Lung tissues were removed and the DEGs were compared between two groups in the six different combinations. DEG profiles and hierarchical clustering of the identified genes were analyzed to evaluate the changes of gene expression. Furthermore, an enrichment analysis based on the gene ontology (GO) data base and KEGG pathway for gene list with significant expression level differences was performed. **결과:** Paraoxonase 1 (PON1), brain expressed X-linked 2 (BEX2), insulin-like growth factor binding protein 6 (Igfbp6), formyl peptide receptor 1(Fpr1), and secretoglobulin family 1C member 1 (SCGB1C1) significantly increased after treatment with ASCs-derived EVs in asthmatic mice. GO analysis showed that these differential genes were mostly involved in immune system process, regulation of immune system process, antigen binding, and catalytic activity. **결론:** These results suggest that an altered gene expression might be involved in the amelioration of allergic airway inflammation by ASCs-derived EVs.

**RHOP-59 09:40~09:50**

#### NOVEL PROTEASE-ACTIVATED RECEPTOR 2 AN-

18월 (금)

본과 및 유관 학회 포스터 발표

Education Program

이과 구역 (OTOP)

비과 구역 (RHOP)

두경부 구역 (HNOP)

TPP

## TAGONIST AS A THERAPEUTIC MOLECULE FOR ALLERGIC AIRWAY DISEASES

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIV COLLEGE OF MEDICINE, <sup>2</sup>YONSEI UNIV COLLEGE OF PHARMACOLOGY, <sup>3</sup>THE AIRWAY MUCUS INSTITUTE, YONSEI UNIV COLLEGE OF MEDICINE, <sup>4</sup>KOREAN MOUSE PHENOTYPING CENTER, <sup>5</sup>MEDICAL RESEARCH CENTER, YONSEI UNIVERSITY COLLEGE OF MEDICINE

MI RAN KANG<sup>1</sup>, YOHAN SEO<sup>2</sup>, WAN NAMKUNG<sup>2</sup>, JU HEE SEO<sup>1</sup>, JONG GYUN HA<sup>1</sup>, CHANG-HOON KIM<sup>1,3,4,5</sup>, JOO-HEON YOON<sup>1,3,4</sup>, HYUNG-JU CHO<sup>1,3,4</sup>

**목적:** Allergic rhinitis(AR)/asthma is a chronic disease characterized by airway hyperreactivity and Th2-cytokine-mediated inflammation. Protease-activated receptor(PAR)-2 is expressed in airway epithelial cells and various immune cells. Antagonist of PAR2 has been suggested to be helpful for allergic airway diseases, but there is no effective specific PAR2-antagonist. We aimed to find a novel molecule to inhibit PAR2 and investigated its mechanism. **방법:** We performed high-throughput screening to identify highly potent/selective inhibitors. Mouse model of HDM-induced AR/asthma was used. Allergic phenotypes and therapeutic effect by PAR2-antagonist were confirmed by sIgE, histology, Th2-related cytokines/genes. The allergy phenotype of PAR2-ko mice was determined. RNA transcriptomics was analyzed from nasal/lung tissue. Multiplexing assay, calcium measurement, western blot, realtime-PCR and single-cell(sc) RNAseq were performed in primary human nasal epithelial(HNE) cells. **결과:** Novel PAR2-antagonists were discovered from screening of natural product library and we found that P2N can block specifically PAR2(IC<sub>50</sub><3μM). The P2N suppressed PAR2AP- or HDM-induced [Ca<sup>2+</sup>]<sub>i</sub> elevation and Th2-cytokines in HNE cells. P2N inhibited cell proliferation-associated signaling pathway. AR/asthma model using PAR2-ko mice indicated significantly attenuated allergic phenotypes. P2N-treated allergic

mouse model showed successful inhibition of allergic phenotypes likely in PAR2-ko mice. Transcriptomics analysis using RNAseq revealed >250 of upregulated/downregulated genes in PAR2-ko mice. scRNAseq analysis newly revealed the cell types expressed by PAR2 gene. **결론:** We found a new PAR2-specific antagonist having high efficacy by high-throughput screening. PAR2 antagonist can successfully attenuate allergic phenotypes in mouse and cell models. We suggest this molecule can be utilized as a new therapeutic for allergic airway diseases.

**RHOP-60 09:50~10:00**

## ASIAN SAND DUST REGULATES IL-32 PRODUCTION IN NASAL EPITHELIAL CELLS: INHIBITORY EFFECT OF GLUCOCORTICOIDS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY, COLLEGE OF MEDICINE, SEOUL, KOREA

JONG-GEUN LEE, JAE-MIN SHIN, HWEE-JIN KIM, JOO-HOO PARK, HEUNG-MAN LEE

**목적:** Asian sand dust (ASD) is associated with chronic inflammatory diseases of the respiratory system. The aims of this study were to evaluate the effects of GCs on ASD-induced IL-32 expression and to identify the underlying signaling pathways in nasal epithelial cells. **방법:** MTT assay was used to evaluate cytotoxicity in A549 and human primary nasal epithelial cells. Expression levels of IL-32 messenger RNA and protein were measured by Western blot, real-time polymerase chain reaction, ELISA, and immunofluorescence staining. Signaling pathways were analyzed using specific inhibitors of Akt, MAPK, or NF-κB. The effects of GCs on the expression of ASD-induced IL-32 were confirmed with ex vivo organ cultures of the nasal interior turbinate. **결과:** ASD had no significant cytotoxic effects in A549 cells and primary nasal epi-



thelial cells. Expression levels of IL-32 were dose-dependently upregulated by ASD treatment in A549 cells. ASD induced phosphorylation of Akt, MAPK, and NF- $\kappa$ B, whereas GCs and their specific inhibitors downregulated these activations and expression of IL-32. These findings were further confirmed in human primary nasal epithelial cells and ex vivo organ cultures. **결론:** GCs have an inhibitory effect on ASD-induced IL-32 expression via the Akt, MAPK, and NF- $\kappa$ B signaling pathways in nasal epithelial cells.

## RHOP 11

중앙

09:00~10:00 • 세미나실3

Chairperson(s) : 모지훈(단국대의대), 김용민(충남의대)

**RHOP-61 09:00~09:10**

### DOES CONTRALATERAL TRANSSEPTAL TUNNELING HAVE BENEFIT FOR SINONASAL FUNCTION IN ENDOSCOPIC SKULLBASE SURGERY WITH NASOSEPTAL FLAP?

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY AND <sup>2</sup>NEUROSURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, DEPARTMENT OF NEUROSURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE

JI-EUN CHOI<sup>1</sup>, YANG-SUB NOH<sup>1</sup>, KYEUNGEUN LEE<sup>1</sup>, HUN-JONG DHONG<sup>1</sup>, SEUNG-KYU CHUNG<sup>1</sup>, HYOEOL KIM<sup>1</sup>, DOO-SIK KONG<sup>2</sup>, DO-HYUN<sup>2</sup>, SANG DUK HONG<sup>1</sup>

**목적:** Previously, we have reported sinonasal benefit

of endoscopic modified transseptal transsphenoidal approach that use left transseptal tunneling and right rescue flap. Similarly, we had used contralateral transseptal tunneling and nasoseptal flap for high flow cerebrospinal fluid (CSF) leakage for preventing the posterior septal perforation. In this study, we will compare the sinonasal outcome and olfactory function between contralateral transseptal tunneling and traditional endonasal approach that lead to large posterior septectomy. **방법:** Retrospective analysis of prospectively collected surgical database from Jan 2016 to Dec 2018. Patients who underwent nasoseptal flap after tumor resection were included. Total 40 subjects were enrolled. 19 patients underwent endoscopic transnasal transsphenoidal approach(ETN-TSA), and 21 patients underwent endoscopic modified transseptal transsphenoidal approach (EMTS-TSA). Sino-Nasal Outcome Test-22 (SNOT-22) and visual analog scale (VAS) for subjective olfaction were evaluated before and 1, 3 and 6 months postoperatively. Cross cultural smell identification test (CCSIT) and Butanol threshold test (BTT) were also collected to assess objective outcome. **결과:** Of 40 enrolled patients, 14 pituitary adenoma, 10 meningioma, 8 craniopharyngioma, 3 Rathke cleft cyst, 1 chordoma and 4 others underwent nasoseptal flap reconstruction after surgical removal. There were no statistical difference in olfaction and sinonasal outcome analysis between two groups. Moreover, changes ( $\Delta$ ) of each outcome parameters at each time point did not differ. Only one patient (5.2%) from EMTS-TSA group developed saddle nose 6 months after surgery because of cartilage necrosis. **결론:** The contralateral septal tunneling when using nasoseptal flap doesn't seem to have benefits for sinonasal quality of life or olfaction compared with traditional endonasal approach despite of development of a saddle nose deformity. Further studies are needed to validate our data.

18일 (금)

분과 및 유관 학회 포스터 발표

Education Program

이과 구역 (OTOP)

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두경부 구역 (HNOP)

TPP

## RHOP-62 09:10~09:20

**SALVAGE SURGERY AFTER INDUCTION CHEMOTHERAPY IN SINONASAL MALIGNANCY**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

JEONG-YEON JI, HYUN JIK KIM, TAE-BIN WON, CHAE-SEO RHEE, DONG-YOUNG KIM

**목적:** 수술적 치료가 어려운 비강 및 부비동 악성종양에서 유도항암요법을 초치료로 적용하게 되는 경우가 많다. 유도항암요법 및 이후에 이어지는 방사선치료 후에도 잔존암이 남아있거나 재발 또는 진행하는 경우, 구제 치료법으로 수술을 선택하게 된다. 본 연구에서는 최근 본원에서 경험한 비강 및 부비동 악성종양의 유도항암 요법 후 구제 수술을 시행한 증례를 통해 고찰해보고자 한다. **방법:** 비강 및 부비동 악성종양 진단 후 유도항암요법 후 잔존암 또는 진행 암으로 구제 수술을 시행한 증례에 대해 후향적으로 의무기록을 검토하였다. 각 증례에서 병리학적 진단, 초치료 전 종양의 범위, 구제 수술 범위, 수술 후 최종 병리학적 진단, 치료 성적 등을 분석하고자 하였다. 특히, 잔존암이 의심되었으나 구제 수술 후 조직검사에서 종양이 발견되지 않았던 증례들을 분석하여 보았다. **결과:** 첫째 증례의 64세 남성 환자는 우측 비강의 소세포암으로 유도항암요법 및 방사선 치료를 시행하였고, 방사선치료 종료 후 촬영한 PNS MRI에서 잔존암이 발견되어 내시경적 두개안면절제술을 시행하였다. 두번째 증례의 19세 남성 환자는 좌측 비강의 저분화암으로 유도항암요법 및 방사선치료를 시행하였고, 방사선치료 종료 후 촬영한 PNS MRI에서 잔존암으로 내시경적 두개안면절제술을 시행하였다. 세번째 증례의 52세 남성 환자는 좌측 비강의 저분화암으로 유도항암요법 시행 후 촬영한 PNS PET/MR 상 metabolic CR 상태였으나 MRI 소견에서 전두동 병변의 크기 증가 및 경막 침범 의심 소견으로 내시경적 종양 절제술을 먼저 시행하였는데, 종양은 경막 침범이 없었으며 전두동으로부터 잘 분리되었다. 이 세 증례 모두 수술 후 최종 병리 조직 검사 결

과에서 잔존암이 발견되지 않았다. **결론:** 일부 증례들에서는 유도항암요법 후 영상학적으로 잔존암 또는 국소진행암이 의심되었으나, 실제 수술장 소견 또는 최종 병리 조직 검사 결과는 영상 소견과 괴리가 있었다. 따라서, 유도항암요법 후 잔존암에 대한 광범위한 절제술을 시행하기 전에, 의심되는 잔존암에 대한 조직 검사 결과를 먼저 확인 하는 것이 불필요한 수술을 피할 수 있는 방법일 것이다.

## RHOP-63 09:20~09:30

**A RETROSPECTIVE CT ANALYSIS FOR PRELACRIMAL WINDOW ACCESS TO MAXILLARY SINUS INCLUDING NORMAL CONTROL GROUP IN KOREAN**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KONKUK UNIVERSITY SCHOOL OF MEDICINE

JIYEON LEE, KYUJIN HAN, HAEMIN NOH, SEOK-CHAN HONG, JIN KOOK KIM

**목적:** 전누골와 접근법은 상악동에 발생한 양성종양 제거술의 접근법 중 하나로 상악동 전벽과 코눈물관의 앞쪽 경계의 거리(D1)에 따라 접근의 용이성이 차이가 나서, D1이 7mm 이상(Type3)일 경우는 쉽게 접근이 가능하며, 3~7mm(Type2) 경우에는 접근은 가능하나 코눈물관 전위나 소량의 골제거가 필요할 수 있고, 3mm 이하(Type1)의 경우에는 항상 코눈물관 전위나 상당량의 골제거가 필요하다고 보고되었다. 유럽과 중국의 보고에 따르면 인종별로 D1의 차이가 있고, 각각 68.5%, 93%의 환자 (Type1 + 2)에서 전누골와 접근법이 용이하다고 보고되었으나, 정상군과 환자군의 차이를 비교하지 못한 한계가 있었다. 본 연구에서는 1)한국인에서 D1의 분포를 구하여 이전 결과와 비교하고, 2) 정상군과 환자군을 비교하여 분석하였다. **방법:** 정상인 51명과 양측 비부비동 질환이 있는 환자 98명을 좌, 우로 나누어 총 298쪽의 PNS CT를 후향적으로 분석하였다. D1에 따라 Type 1, 2, 3을 분류하고, 성별, 나이, 상악동 부피를 대응하여 정상군과 환자군의 D1과 전누골와 두께를 비교하였다. **결과:** 전체 298쪽을 분석한 결

과 Type1 20.5%, Type2 63.4%, Type3 16.1%로 수술에 용이한 경우가 79.5%였다. 정상군 102쪽 중 Type1 16.7%, Type2 65.7%, Type3 17.6%의 분포를 보였고, 환자군 196쪽 중 Type 1 22.4%, Type 2 62.2%, Type 3 15.3%의 분포를 보였다. 정상군과 환자군을 비교 시에는 환자군의 D1이 유 의하게 짧았고, D1이 3mm 이상인 그룹 (Type 2, 3)은 환자군이 유의하게 적었 으며, 환자군의 전누골와 두께가 유의하게 두꺼웠다. ( $p<0.05$ )

**결론:** 유럽인 및 중국인과 한국인을 비교하였을 때 인종 및 국가 간의 차이가 있으며, 환자군의 경우 정상군보다 D1이 짧고, 전누골와의 두께가 두꺼워 수술 시 유의하여야 하겠다.

#### RHOP-64 09:30~09:40

### APOPTOSIS AND NECROPTOSIS-INDUCING EFFECTS OF ARCTIGENIN ON NASAL SEPTUM CARCINOMA RPMI-2650 CELLS IN 2D AND 3D CULTURE

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY

GWANG-HUI RYU, SANG-BIN KIM, DONG-YEON LEE, SIN-AE KIM, YOUNG-JOON JEON, BYOUNG-JOON BAEK

**목적:** The objective of this study was to investigate cytotoxic effects of arctigenin(ATG) and dexamethasone(DMS), either alone or in combination, on nasal septum carcinoma cells and examine expression levels of biochemical marker proteins related to apoptosis, necroptosis, and DNA damage. **방법:** Cytotoxic effects of ATG and DMS were examined in 2D monolayer and 3D spheroid cultures using nasal septum carcinoma RPMI-2650 cells. Cell viability was determined using the MTT assay. Cell cycle analysis was performed. The distribution of apoptotic-cells was determined using Annexin V-phycoerythrin(PE) staining. Intracellular ROS levels were determined by measuring the fluorescence intensity of DCF-DA.

Mitochondrial membrane potential was measured using MACSQuant® analyzer flow cytometer. Cellular ATP levels was measured using the CellTiter-Glo® Luminescent cell viability assay. **결과:** The combination treatment of both compounds induced strong cytotoxicity, accompanied by increases of sub-G0/G1 peak, annexin V-PE positive cells, and ROS levels, loss of mitochondrial membrane potential, and decrease of cellular ATP content. These changes were observed as simultaneous induction of DNA damage, apoptosis, and necroptosis. A series of changes by ATG and DMS were efficiently restored by decreasing ROS levels or supplementing ATP. Treatment of 3D spheroids with ATG and DMS decreased cell viability in the spheroids, but it were slightly resistant than cells under 2D conditions. **결론:** This study suggest that the apoptosis and necroptosis-inducing effects of ATG are associated with ATP depletion due to oxidative mitochondrial dysfunction.

#### RHOP-65 09:40~09:50

### ORBIT INVASION AND ORBIT PRESERVATION RATE IN SINONASAL CANCERS: EXPERIENCE FROM SNUH

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL, KOREA

JEON SEONG, YOONJAE SONG, SUNG-WOO CHO, HYUN-JIK KIM, JEONG-WHUN KIM, DONG-YOUNG KIM, CHAE-SEO RHEE, TAE-BIN WON

**목적:** Sinonasal cancers of various pathologic types frequently involve the orbit. The initial treatment strategy, the rate of orbit preservation, and the prognosis differs from case to case. Currently, multimodal treatment including surgery, chemotherapy and radiotherapy is often required for sinonasal cancers. This

study aimed to assess the clinical characteristics of sinonasal cancers with orbit invasion. **방법:** The patients with primary sinonasal cancers who were treated in Seoul National University Hospital between 2009 and 2018 were retrospectively reviewed. Sinonasal cancers involving the orbit were investigated, regarding the cancer pathology, extent of orbit invasion, treatment strategy, recurrence, and 5-year survival rate. **결과:** Among 178 patients with sinonasal cancer, 75 patients (42.1%) were found to have orbital involvement at the initial diagnosis on the MR image. Among them, the most common pathology was squamous cell carcinoma (44 pts, 58.7%), which was followed by olfactory neuroblastoma (7 pts, 9.3%), lymphoma or adenoid cystic carcinoma (each 3 pts, 4.0%). Induction chemotherapy (45 pts, 60.0%) was most often selected as the initial treatment, where surgery (16 pts, 21.3%), CCRT (9 pts, 12.0%) and RT only (3 pts, 6.7%) followed. Six patients (8.0%) finally failed to preserve the orbit, with only two patients received surgical treatment with orbital exenteration as the initial treatment. During the follow up period, the recurrence rate was significantly different with (39/75, 52.0%) or without (20/103, 19.4%) orbit invasion at the initial diagnosis ( $p=0.02$ ). **결론:** Orbit invasion at the initial diagnosis was most common in the squamous cell carcinoma. The degree of orbit invasion was also related to the recurrence rate. The multimodal treatment seems to have a crucial role for orbit preservation in sinonasal cancers with orbital invasion.

**RHOP-66 09:50~10:00**

#### **ADJUVANT TREATMENT OF PD-1 IMMUNE CHECKPOINT INHIBITOR IN SINONASAL MALIGNANT MELANOMA: A PILOT STUDY**

DEPARTMENTS OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE,

SEOUL, KOREA

SONG I PARK, SEUNG-KYU CHUNG, HUN-JONG DHONG, HYU YEOL KIM, SANG DUK HONG

**목적:** Mucosal melanoma of the sinonasal cavity is a rare disease and has a poor prognosis. Treatment options consist of radical surgery and radiotherapy, while chemotherapy is reserved for advanced forms. It is well known that anti-PD1 antibody therapy is beneficial in treating metastatic mucosal melanoma. However, local recurrence is observed in about 50% of cases and metastatic disease is common. In this study, we tried to explore the effect of anti-PD1 antibody in local control in mucosal melanoma of the nasal cavity. **방법:** The medical charts of the patients who were diagnosed in malignant melanoma in the nasal cavity between 1995 and 2018 in our institution were reviewed retrospectively. Among 98 patients, cases with insufficient data, non-surgical therapy as an initial treatment or revision cases were excluded. In total, 45 patients were recruited. As anti-PD1 recently had been used clinically for mucosal melanoma, only 7 patients treated after 2016 included in the anti-PD1 group. The associations of anti-PD1 with recurrence rate and treatment-related survival outcomes were assessed. **결과:** Anti-PD1 group and the control group did not show a statistically significant difference in demographic or tumor characteristics at presentation. The local recurrence rate was lower in the anti-PD1 treated group than in the control group (14.3% vs 60.5%,  $p=0.04$ ). Although there was no statistical significance, the 2-year survival rate, and 2-year local recurrence-free survival rate were also higher in the anti-PD1 treated patients (2-year overall survival rate: 100.0% vs 80.2%,  $p=0.38$ , 2-year local recurrence-free survival rate; 85.7% vs 36.2%,  $p=0.13$ ), but 2-year distant metastasis-free survival rate was lower in the anti-PD1 group (57.1% vs 74.8%,  $p=0.23$ ). **결론:** Anti-PD1 treatment might be beneficial for controlling in local recurrence in patients with M0 status

but not in distant metastasis. To support this, a long-term follow-up study with a larger population will be needed.

## RHOP 12

### 부비동염 II

10:20~11:20 • 세미나실1

Chairperson(s) : 정승규(성균관의대), 박석원(동국의대)

### RHOP-67 10:20~10:30

#### DIFFERENTIAL EFFECTS OF ANTIBIOTICS ON THE NASAL MICROBIOME IN CHRONIC RHINOSINUSITIS

<sup>1</sup>OBSTRUCTIVE UPPER AIRWAY RESEARCH (OUAR) LABORATORY, DEPARTMENT OF PHARMACOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

YI-SOOK KIM<sup>1,2,8</sup>, JI-HUN MO<sup>3,10</sup>, YONG-MIN KIM<sup>4,10</sup>, DAE WOO KIM<sup>5,10</sup>, HYU-GUEN CHOI<sup>6</sup>, JONG-WAN PARK<sup>1,2,7,8</sup>, HYUN-WOO SHIN<sup>1,2,7,8,9,10</sup>

**목적:** Nasal microbiome studies have shown dysbiosis and its potentially pathogenic role in chronic rhinosinusitis (CRS). Given that antibiotics may affect metagenomics profiles and are frequently prescribed in CRS, previous studies have not thoroughly examined the nasal microbiome of CRS in terms of antibiotics usage. We investigated the nasal microbiome in CRS with a focus on the effects of antibiotics. **방법:** Nasal secretions from 29 control, 30 CRS without nasal polyp (CRSsNP), and 40 CRS with nasal polyp (CRSwNP) patients were collected using sterilized strips of filter paper placed on the middle meatus and analyzed using 16S rDNA sequencing. The nasal mi-

crobiome differed between patients who had taken antibiotics within 3 months before sampling ("Antibiotics") and those who had not ("No antibiotics"). **결과:** Metagenomics of total of 99 subjects and no antibiotics group showed that CRSwNP had the greatest Shannon and Simpson indices. At family level, the relative abundance of Propionibacteriaceae significantly decreased in CRSwNP compared to control and CRSsNP. However, in antibiotics group, no significant differences between the disease states were observed for diversity and families. When the microbial composition was compared between no antibiotics and antibiotics groups in each disease state, there were significant differences in Shannon and Simpson indices only in CRSwNP. **결론:** Analysis of the nasal microbiome revealed that antibiotics might have the greatest effect on the microbial community in CRSwNP compared to other disease states. The epithelial disruption in CRSwNP could make it easier for microbiome to be shift to other equilibrium by antibiotics.

### RHOP-68 10:30~10:40

#### PROGNOSIS ACCORDING TO FUNGAL BALL LOCATION IN MAXILLARY SINUS AND THE DISEASE PROGRESSION IN FUNGAL SINUSITIS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, DANKOOK UNIVERSITY COLLEGE OF MEDICINE  
YEO-RIM JU, KI-YONG CHOI, JI-HUN MO, YOUNG-JUN CHUNG

**목적:** 진균구(fungus ball)는 진균성 부비동염 중 발생빈도가 가장 높고 양호한 경과를 보이는 질환이지만 진균구의 병변의 정도에 따른 치료 경과에 대한 연구는 많이 알려져 있지 않다. 본 연구에서는 진균구의 위치 및 병변의 정도에 따라 환자들의 치료 경과에 어떤 차이가 있는지 알아보려고 하였다. **방법:** 본원에서 2010년 1월부터 2019년 1월까지 부비동 내시경 수술을 받은 후 조직 검사상 진균구가 진단된 165명의 환

자들의 의무기록을 후향적으로 조사 하였다. 진균구의 위치 및 병변의 정도에 따라 4 군으로 분류하였다. 1군은 진균구가 상악동 저부에만 위치하며 비강내에 아무런 이상소견이 보이지 않는 경우, 2군은 진균구가 상악동 중간 위치에서 관찰되고 비강에 농성 비루가 보일 때, 3군은 상악동이 완전 혼탁 소견을 보이고 진균구가 자연 공까지 진행된 경우, 4군은 진균구가 비강으로 돌출된 경우로 나누었다. 수술 후 외래에서 비 내시경으로 상태를 확인하였으며 Lund-Kennedy scoring에 따라 비분비물, 부종, 비용종과 같은 병적인 증거가 하나라도 있는 경우는 수술 후 경과가 나쁜 군으로 분류하였으며 이러한 병적인 증거가 하나도 없는 경우는 경과가 좋은 군으로 분류하였다. 그리고 환자들의 비강과 부비동의 점막이 완전히 회복되는 시점을 확인하여 군간의 차이가 있는지 평가하였다. **결과:** 환자들의 평균연령은  $60.9 \pm 11.8$ 세 (28 ~ 85세), 남녀 비율은 55 : 110명 (33% : 67%)이었다. 병변측은 편측이 158명 (95.8%)이었으며 양측인 경우가 7명 (4.2%)이었다. 병변의 정도에 따라 분류하였을 때 1군이 23명, 2군이 38명, 3군 61명, 4군은 43명이었다. 1군 환자들은 무증상인 경우가 가장 많았으며 병변이 진행되어 진균구의 위치가 자연공에 가까워질수록 후비루나 농성비루 등 증상을 호소하는 환자들이 많았다. 병변의 진행 정도가 심한 3, 4군이 1, 2군에 비해 회복되는 기간이 길었고 ( $p < 0.001$ ) 예후도 좋지 않았다. ( $p = 0.007$ ) **결론:** 대부분 수술 후 양호한 경과를 보였으나 본 연구에서는 진균구가 비강을 돌출되고 영상 소견상 염증이 심하게 진행된 상태일수록 회복 기간이 오래 걸렸으며 예후가 나빴다. 따라서 본 연구결과는 진균구 환자들의 경과 및 수술 예후를 예측하는 것에 도움이 될 것이다.

**RHOP-69 10:40~10:50**

## **BONY DEHISCENCE IN THE LATERAL WALL OF THE SPHENOID SINUS: PREVALENCE AND ITS IMPLICATION**

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE  
SEUNG HEON KANG, YOONJAE SONG, YUN JUNG

BAE, TAE-BIN WON, JEONG-WHUN KIM, CHAE-SEO RHEE, SUNG-WOO CHO

**목적:** According to the literature, bony dehiscence at the lateral wall of the sphenoid sinus is reported to be rare. However, authors have experienced frequent bony dehiscence of sphenoid sinus in patients with sphenoid fungus ball. Therefore, this study evaluated the prevalence of bony dehiscence of sphenoid sinus according to pathology. **방법:** This is a single-center study with retrospective analysis during 2017.01 to 2019.01. First, patients who had been treated with sphenoid fungus ball (SFB) were recruited. This was followed by recruitment age and sex-matched patients with bilateral chronic rhinosinusitis(CRS) or with pituitary adenoma(PA). Presence and width of the bony defect were measured in the coronal section of paranasal sinus CT scan with 2mm thickness in the bone setting. For sphenoid fungus ball, the ipsilateral side was selected for analysis, and for others, side of analysis was selected randomly. **결과:** In total, 65 patients were analyzed (27 SFB, 15 PA, 23 CRS). All bony defects were located medial to foramen rotundum and superior orbital fissure, just anterior to opticocarotid recess. In SFB, bony defects were present in 74.1%(20/27) and were significantly more frequent compared to PA (20.0%) and CRS(26.1%) ( $p < 0.001$ ). The width was highest in SFB( $1.24 \pm 6.96$ mm) followed by CRS ( $0.79 \pm 0.18$ mm) and PA( $0.72 \pm 0.32$ mm). However, the difference was not significant( $p = 0.304$ ). Bony osteitis was most frequently observed in SFB(88.8%) followed by CRS(56.5%) and PA(0%). Logistic regression revealed that the presence of bony defect was more dependent on the presence of osteitis rather than sinus pathology. During the study period, 3 patients with SFB presented with invasive fungal sinusitis. In two patients, lateral wall defect was the route on invasion to the skull base. **결론:** Sphenoid sinus lateral wall defect is more frequently observed when the bony osteitis is present. In SFB which bony

otitis is common, this bony defect could be a route of skull base invasion.

#### RHOP-70 10:50~11:00

### THE EFFECT OF CHRONIC SINUSITIS ON EUSTACHIAN TUBE FUNCTION IN ADULT PATIENTS: A PROSPECTIVE CASE-CONTROL STUDY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY COLLEGE OF MEDICINE, KANGNAM SACRED HEART HOSPITAL

SOOKYUNG JANG, JONG KYOU LEE, GANGHYEON SEO, SU-KYOUNG PARK, KYU YOUNG CHOI

**목적:** To evaluate the effect of chronic sinusitis on Eustachian tube function in adult patients who underwent endoscopic sinus surgery, and to compare the Eustachian tube function with patients without sinusitis. **방법:** Thirty patients who underwent endoscopic sinus surgery for treatment of chronic sinusitis and other thirty patients without sinusitis who underwent other nasal surgeries (septoplasty, rhinoplasty, or closed reduction) were evaluated for Eustachian tube function before and after one month of their surgeries. The Eustachian tube functions tests included the Seven-Item Eustachian Tube Dysfunction Questionnaire (ETDQ-7), Valsalva test, and Inflation-Deflation test that were compared preoperatively versus postoperatively in both groups. **결과:** Compared to the group with no sinusitis, the sinusitis group showed significant improvement of Eustachian tube function after surgery in ETDQ-7 ( $P = 0.004$ ), right Valsalva test ( $P = 0.041$ ), left Inflation test ( $P = 0.028$ ), right Deflation test ( $P = 0.003$ ), and left Deflation test ( $P = 0.004$ ). Binary logistic regression analysis revealed that the sinusitis treatment significantly improved Eustachian tube function in right Valsalva test in univariate ( $P = 0.021$ ) and multivariate analysis ( $P = 0.007$ ), and Eustachian tube function in right Deflation test in univariate ( $P$

$= 0.011$ ) and multivariate analysis ( $P = 0.037$ ). **결론:** Eustachian tube function significantly improved after surgical treatment of sinusitis compared to the cases without sinusitis in Valsalva test and Deflation test in the right side.

#### RHOP-71 11:00~11:10

### ASSOCIATION BETWEEN SPECIFIC IGE TO STAPHYLOCOCCAL ENTEROTOXIN B AND SEVERITY OF CHRONIC RHINOSINUSITIS

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>THE AIRWAY MUCUS INSTITUTE, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>KOREA MOUSE SENSORY PHENOTYPING CENTER, <sup>4</sup>MEDICAL RESEARCH CENTER, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>5</sup>GLOBAL RESEARCH LABORATORY FOR ALLERGIC AIRWAY DISEASES

JEONG JIN PARK<sup>1</sup>, JAE SUNG NAM<sup>1</sup>, HYUNG-JU CHO<sup>1,2,3</sup>, CHANG-HOON KIM<sup>1,2,3,4</sup>, JOO-HEON YOON<sup>1,2,3</sup>, JONG-GYUN HA<sup>1,5</sup>

**목적:** CRS is a complex disease affected by multiple factors and described by various pathophysiologies, and efforts have been made to discover phenotypes and endotypes of CRS. The aim of this study is to elucidate the clinical association between IgE-SEB and CRS. **방법:** We retrospectively reviewed 965 patients who tested specific IgE to SEB from December, 2016 to December, 2017. Sex, Age, BMI(kg/m<sup>2</sup>), alcohol and smoke history, comorbidity of HTN, DM, AR and Asthma, serum neutrophil(%) and eosinophil(%), SNOT-22 and Lund-Mackay CT score were reviewed. Titer of specific IgE to Dp, Df, Cat, Dog, staphylococcal enterotoxin B, total IgE(kU/L) were measured by immunoCAP. **결과:** A total 721 patients were classified into 4 groups according to diagnosis, CRS, recurrent CRS, Fungal sinusitis, and Non-CRS. Cases with septoplasty, turbidoplasty, rhinoplasty,

closed reduction were categorized as Non-CRS group. The number of each group were 381, 66, 67, and 207, respectively. IgE-SEB was not different significantly between Non-CRS and CRS, and also between Recurred CRS and CRS. Between CRS s NP and CRS w NP, serum eosinophil and ECRS ratio was higher in CRS w NP, but IgE-SEB were not significantly different. Lund-Mackay CT score and presence of NP were significant positive determinant of post-operative recurrence in CRS. We divided CRS group into mild, moderate, and severe, based on the Lund-Mackay CT score set by statistical analysis. Presence of NP, SNOT22, IgE-SEB, asthma comorbidity, serum eosinophil, total IgE titer, and ECRS ratio showed positive correlations with CRS severity. IgE-Dp, IgE-Df, total IgE and Lund-Mackay CT score were higher in CRS with IgE-SEB(+). **결론:** Significant factors affecting recurrence were only high L-M score and presence of nasal polyp. IgE-SEB showed a positive correlation with CRS severity, but not with post-operative recurrence or presence of NP. CRS are affected by numerous factors and further studies will be needed to obtain full evidence IgE-SEB to be an endotype of CRS.

#### RHOP-72 11:10~11:20

### RELATION BETWEEN BITTER TASTE RECEPTOR T2R38 AND CHRONIC RHINOSINUSITIS IN KOREAN POPULATION

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, <sup>2</sup>DEPARTMENT OF BIOLOGY, COLLEGE OF NATURAL SCIENCES, KYUNGPOOK NATIONAL UNIVERSITY

SUNG JAE HEO<sup>1</sup>, HYE MIN KIM<sup>2</sup>, YE RI KIM<sup>2</sup>, JUNG SOO KIM<sup>1</sup>, UN KYUNG KIM<sup>2</sup>

**목적:** Chronic rhinosinusitis (CRS) is a common disease with high socio-economic burden and multifac-

torial pathogenesis. The bitter taste receptor T2R38 was recently described to play a role in upper airway innate mucosal defense including CRS. Polymorphisms within the T2R38 gene (TAS2R38) confer variability in activation of the receptor yielding dramatic differences in upper airway defensive responses to microbial stimulation based on genotype. Some studies have demonstrated the association between CRS and T2R38, and some studies do not. In addition, as there is no research on Asians, the authors attempted to investigate the relationship between T2R38 and CRS in Koreans. **방법:** Fifty patients with CRS and 42 healthy individuals were genotyped at the TAS2R38 locus. The genotypes of T2R38 gene are divided into 3 most common genotype (PAV/PAV, PAV/AVI, AVI/AVI). Relationship between the presence of CRS and genotype distribution were investigated. **결과:** Distribution of genotype in CRS patients were PAV/PAV in 13, PAV/AVI in 25, and AVI/AVI in 12 patients. Distribution of genotype in control patients were PAV/PAV in 17, PAV/AVI in 19, and AVI/AVI in 6 patients. There was not statistically significant difference of genotypes of T2R38 gene between CRS patients and control ( $P = 0.262$ ). **결론:** No significant relation was found between genotypes of T2R38 genes and CRS in Korean, thus questioning its role in the pathogenesis of CRS.

## RHOP 13

비내시경 수술

11:20~12:20 • 세미나실1

Chairperson(s) : 김경래(한양의대), 김규보(한림의대)

#### RHOP-73 11:20~11:30

### DEVELOPMENT OF NEW INTEGRATED SYSTEM



## OF 3D SURGICAL NAVIGATION SYSTEM AND COMPARISON OF FITNESS INDEX USING TWO SYSTEMS

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SEON-TAE KIM<sup>1</sup>, JOO-HYUN JUNG<sup>1</sup>, SHIN JEE HOON<sup>2</sup>, SUNG KEUN YOO<sup>3</sup>, SUNGHUI JANG<sup>4</sup>, WON-JIN YI<sup>5</sup>

**목적:** We have aimed to develop the new surgical navigation system integrated with balloon catheter under the national research fund by KEIT. Recently we have developed the point registration navigation system and we compared the fitness index between the MEDIGATOR(new product) and SCOPIS hybrid system. **방법:** We have compared the registration time, image loading time, registration error between two systems in the 12 patients who have been received the endoscopic sinus surgery for chronic maxillary sinusitis. The fitness of index was compared in the 5 points, anterior portion of middle turbinate, ostium of maxillary sinus, ostium of sphenoid sinus and posterior wall of ethmoid sinus by visual analogue score. **결과:** The registration time between MEIGATOR and SCOPIS was ( $35.77 \pm 4.5$  vs  $90.07 \pm 25.1$ ), image loading time was ( $1.41 \text{sec} \pm 0.24$  vs  $19.43 \pm 2.61$ ), registration error was ( $3.09 \pm 0.78$  vs  $0.49 \pm 0.09$ ). The total average score of fitness index in 5 different points were 9.23 vs 9.35 between MEIGATOR and SCOPIS. There was no specific difference between two systems. **결론:** We have developed a new point registration method navigation system. The comparison between two systems have shown similar scores of in fitness index.

RHOP-74 11:30~11:40

## EXPERIENCE OF MANAGING INTERNAL CAROTID ARTERY INJURY DURING TRANSNASAL ENDOSCOPIC SKULL BASE SURGERY

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL ST MARY HOSPITAL, SEOUL, KOREA

DO HYUN KIM, IL HWAN LEE, SUNG WON KIM

**목적:** To investigate the cause and urgent management of internal carotid artery injury during transnasal endoscopic skull base surgery. **방법:** Three cases of internal carotid artery injury encountered during transnasal endoscopic skull base surgery from June 2017 to February 2019 were analyzed retrospectively. There were 1 cases of embryonal rhabdomyosarcoma, 1 case of suprasellar germ cell tumor, 1 case of pituitary adenoma. From these experiences, the cause of internal carotid artery injury and subsequent treatment were analyzed, in order to prevent internal carotid artery injury during transnasal endoscopic surgery. **결과:** In all these 3 cases, as soon as intraoperative massive bleeding, the surgeon clearly and loudly commanded the attention of all operating room staff and informed them about the critical situation. And the surgeon worked in concert with the anesthesiologist to immediately and the anesthesiologist supported fluid and blood replacement for preventing hypovolemic shock. And two surgeons were engaged, allowing one surgeon to control the bloodstream, directing it away from the endoscope while the other obtains visualization to attempt hemostasis. And two large-bore(10F) suction devices and a lens cleaning system for the endoscope were used. The surgeon exerted pressure with the shaft of the suction and by directly applying pressure with cottonoids. And the angiography suite team was activated. **결론:** The iatrogenic injury of the internal carotid artery is related to inadequate surgical procedures, anatomical localization and variation. The multidisciplinary experienced team approach is

important for handle this situation.

**RHOP-75 11:40~11:50**

**COMPARISON OF TWO SURGICAL APPROACH FOR TREATMENT OF MAXILLARY SINUS INVERTED PAPILLOMA ENDOSCOPIC PRELACRIMAL RECESS APPROACH VERSUS CALDWELL-LUC APPROACH**

DEPARTMENT OF OTOLARYNGOLOGY HEAD AND NECK SURGERY, INJE UNIVERSITY COLLEGE OF MEDICINE, HAEUNDAE PAK HOSPITAL, BUSAN, SOUTH KOREA

YEONG-JUN PARK, TAE-KYUNG SUH, MYUNG-JUN LEE, BYUNG-WHOO PARK, YONG-WAN KIM

**목적:** Endoscopic prelacrimal recess approach(PLRA) was introduced to treat maxillary inverted papilloma without sacrificing the inferior turbinate (IT) and nasolacrimal duct (NLD). This study aimed to compare prelacrimal recess approach(PLRA) with the conventional Caldwell-Luc approach (CLA) to remove IP of maxillary sinus and to evaluate the usefulness of the PLRA. **방법:** We retrospectively reviewed medical records of 15 patients who were treated in our institution for maxillary sinus IP between March 2010 and June 2019. All patients underwent endoscopic sinus surgery combined with either Caldwell-Luc approach(n=8) or endoscopic prelacrimal recess approach(n=7). Demographic data, surgical technique, site of IP origin, intra- and postoperative complications, duration of follow-up, recurrence rate and pathologic diagnosis were reviewed. **결과:** Pathologic diagnosis were inverted papilloma in all 15 cases. Gross total removal during surgery was achieved in all cases. Mean follow-up period was 20.1 months in CLA group and 13.5 months in PLRA group. Regarding intraoperative complications, there was one case of massive bleeding during operation requiring massive transfusion and postoperative ICU care in CLA group. On postop-

erative follow-up, in CLA group, two patients had recurrence during the follow-up period, one patient had numbness around the gingival area, which disappeared within one month, one wound dehiscence repaired by simple suture, and one oro-antral fistula. None of the PLRA group developed subjective complaints after surgery. **결론:** Endoscopic prelacrimal recess approach is a safe and effective method for the excision of primary maxillary sinus IP with favorable outcomes compared with Caldwell-Luc approach.

**RHOP-76 11:50~12:00**

**THE IMPACT OF MAXILLARY SINUS DIMENSIONS ON DETERMINING SURGICAL APPROACH IN MAXILLARY SINUS LESION**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

WON KI CHO, DONG HYUN KIM, JI HEUI KIM

**목적:** Endoscopic middle meatal antrostomy (MMA) are routinely used to remove maxillary sinus (MS) lesions including chronic rhinosinusitis, fungal sinusitis and benign tumor lesion. However, the lesion involving anterior and/or inferior recess are difficult to completely remove through MMA and may require additional inferior meatal approach (IMA). Therefore, we analyzed the differences of MS dimensions on CT scans according to a surgical approach. **방법:** This study involved 120 adult patients (60 patients for MMA only and 60 patients for MMA with IMA) who underwent ESS for fungal ball in MS. Eight MS dimensions were measured and compared according to a surgical approach. **결과:** Fungal ball was completely removed in all patients. There were no statistically differences in sex and age in two surgical groups ( $P>0.05$ , MMA: 25/35 (M/F) and mean age 61.00

years; IMA: 15/45 (M/F), mean age 63.80 years). Some MS dimensions in male were larger than in females. However, in MMA with IMA group including more females, length of anterior-posterior, nasolacrimal duct to MS anterior wall, and oblique distances from uncinate process (UP) to MS lateral wall and UP to MS inferior wall were statistically greater than those in MMA only group ( $P < 0.05$  for each;  $35.55 \pm 3.58$  vs  $33.24 \pm 4.69$  (mm);  $12.45 \pm 2.78$  vs  $10.95 \pm 2.49$  (mm);  $30.17 \pm 4.58$  vs  $27.68 \pm 5.02$  (mm);  $28.76 \pm 4.59$  vs  $25.90 \pm 5.02$  (mm), respectively). **결론:** This study showed that distances from UP to MS anterior, inferior, and lateral walls are clinically significant determinants in choosing a surgical approach to lesion of maxillary sinus.

#### RHOP-77 12:00~12:10

### PEDIATRIC ENDOSCOPIC SINUS SURGERY: SNUH EXPERIENCE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

JEONG-YEON JI, DOO HEE HAN, HYUN JIK KIM, TAE-BIN WON, CHAE-SEO RHEE, DONG-YOUNG KIM

**목적:** 소아에서 약물 치료에 반응이 없는 재발성 또는 만성 비부비동염에서 내시경 부비동 수술을 시행하게 되며, 일반적으로 성인의 경우보다 제한된 경우에서 보존적인 수술을 시행하게 되는 경우가 많다. 최근 5년 동안에 내시경 부비동 수술을 시행한 소아청소년 환자의 임상적 특성을 검토하여, 소아에서 해당 수술 시행시 고려해야 할 점에 대하여 고찰해보았다. **방법:** 2014년 1월부터 2019년 7월까지 서울대학교병원 어린이병원에서 내시경 부비동 수술을 받은 19세 미만 환자들의 의무기록을 후향적으로 분석하였다. 인구학적 정보, 진단명, 수술 범위 및 재수술 여부 등에 대하여 분

석을 수행하였다. **결과:** 2014년 1월에서 2019년 7월까지 130명의 환자가 내시경 부비동 수술을 시행받았다. 비용종을 동반한 만성 비부비동염 (CRSwNP) 환자가 58명, 비용종을 동반하지 않은 만성 비부비동염 (CRSsNP) 환자가 31명, 후비공용종 (ACP) 환자가 41명 포함되었다. CRSwNP, CRSsNP, ACP 각 군의 수술 당시 나이의 중간값은 12세, 13세, 9세였다. 이 가운데 재수술이 시행된 경우는 각각 6명(10.3%), 0명(0%), 2명(4.9%)이었다. 첫 수술부터 재수술까지의 평균 기간은 약 1.9년이었다. 각 군별로 18명(31.0%), 8명(25.8%), 11명(26.8%)에서 알레르기가 동반되었다. 수술 후 중대한 합병증은 없었으며, 5명(3.8%)에서 수술 후 유착이 동반되었다. **결론:** 소아에서 만성 비부비동염 또는 후비공용종으로 내시경 부비동 수술을 시행하는 경우 중 비용종을 동반한 경우 재발로 인한 재수술의 가능성이 비용종을 동반하지 않은 경우에 비하여 높았다. 수술 후 재수술까지의 평균 기간은 1.9년으로 2년 이상의 추적 관찰이 필요하다. 협조가 잘 되지 않는 환자의 경우 수술 후 검진 및 드레싱에 어려움을 겪을 수 있으므로 이에 대한 고려가 필요하다.

#### RHOP-78 12:10~12:20

### EVALUATION OF RECURRENT MAXILLARY SINUSITIS DUE TO MIDDLE MEATAL ANTROSTOMY SITE STENOSIS AFTER ENDOSCOPIC SINUS SURGERY

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OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, SEOUL HOSPITAL, <sup>4</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, CHEONAN HOSPITAL<sup>4</sup>

HYO-JUN KIM<sup>1</sup>, YOUNG-JOON JUN<sup>2</sup>, SHIN-AE KIM<sup>3</sup>,

GWANG-HUI RYU<sup>4</sup>, BYOUNG-JOON BAEK<sup>4</sup>, JI-HO CHOI<sup>1</sup>, JAE-YONG LEE<sup>1</sup>

**목적:** To evaluate the incidence, occurrence period, and contributing factors influencing middle meatal antrostomy (MMA) site stenosis after endoscopic sinus surgery (ESS). **방법:** The medical records and endoscopic photography of 288 patients diagnosed with chronic rhinosinusitis (CRS) and underwent ESS between 2014 and 2019 were evaluated. Patients visited the office with similar schedule after ESS and the presence of recurrent maxillary sinusitis due to post-operative MMA site stenosis was compared with that of the immediately after the procedure. We evaluated incidence and the time when MMA site stenosis was observed. In cases of recurrent maxillary sinusitis by MMA site stenosis, characteristics of the preoperative computed tomography (CT) scans, intraoperative findings, and possible contributing factors were also investigated. **결과:** Recurrent maxillary sinusitis due to MMA site stenosis occurred in 10 patients. Most of them had unilateral sinusitis and stenosis was observed within 6 months postoperatively. All of the patients had severe inflammation, pus retention, and thick mucosal hypertrophy in the maxillary sinus on the preoperative CT scans, and intraoperative findings confirmed these conditions. Most patients underwent wide trimming of hypertrophied sinus mucosa through canine fossa trephination intraoperatively. **결론:** Recurrent maxillary sinusitis due to MMA site stenosis is a rare condition after ESS. We hypothesized that rapid shrinkage and granulation formation after wide trimming of severely hypertrophied mucosa resulted in MMA site stenosis. Mucosal inflammation may also be a contributing factor. Therefore, conservative trimming, meticulous dressing, and removal of sinus crust and granulation near the MMA site should be necessary in patients with mentioned conditions.

## RHOP 14

알레르기

11:20~12:20 • 세미나실3

Chairperson(s) : 김용복(한림의대), 백병준(순천향의대)

**RHOP-79 11:20~11:30**

### NUMBER OF SEASONAL EXPOSURES TO JAPANESE CEDAR POLLEN INCREASES THE RISK OF SENSITIZATION

DEPARTMENT OF OTORHINOLARYNGOLOGY, JEJU NATIONAL UNIVERSITY COLLEGE OF MEDICINE

HEE JUN YI, JEONG HONG KIM, MICHELLE J SUH, GIL CHAI LIM, JU WAN KANG

**목적:** Sensitization to seasonal allergens usually requires repeated exposure to them. However, research on the extent of exposure that increases the risk of sensitization to specific allergens is lacking. Therefore, we investigated the levels of exposure to Japanese cedar pollen that increased the risk of sensitization to it. **방법:** A cross-sectional study was conducted with 857 college students living in Jeju, South Korea, as it is the only province in Korea where Japanese cedar pollen levels are high. Questionnaires about demographic characteristics were distributed and skin prick tests for allergic sensitization were performed. **결과:** Sensitization rates of groups divided by residence period were 3.8% (less than 1 year), 1.8% (1-2 years), 8.5% (2-3 years), 10.3% (3-4 years), 14.8% (4-10 years), and 19.1% (over 10 years). Residence period was an influencing factor of sensitization rate to Japanese cedar pollen, and the cut-off value of the residence period that increased the risk of sensitization to Japanese cedar pollen was found to be 25 months. **결론:** Repeated exposure to seasonal allergens was related to an in-

creased sensitization rate in young adults. Our results suggested that exposure to Japanese cedar pollen for over two seasons could increase the risk in Korean adults.

#### RHOP-80 11:30~11:40

### EFFECTS OF PI3K PAN-INHIBITORS AND PI3K-DELTA SELECTIVE INHIBITORS ON THE INFLAMMATORY CELLS AND INFLAMMATORY MEDIATORS IN ALLERGIC LUNG INFLAMMATION: SYSTEMATIC REVIEW AND META-ANALYSIS

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JONG SEUNG KIM<sup>1</sup>, SAM HYUN KWON<sup>1</sup>, JAE SEOK JEONG<sup>2</sup>, YONG CHUL LEE<sup>2</sup>

**목적:** Using meta-analysis, we will investigate the effects of phosphoinositide-3-kinase on the inflammatory profile in allergic mouse models, which are currently under development in signal transduction materials. **방법:** PubMed, EMBASE and Web of Science databases were searched for relevant literature using the search term 'PI3k inhibitor' and 'allergy' or 'asthma'. Cochrane Review Manager and R were used for handling continuous variables. The primary outcomes of the inflammatory profile were: total cell count, eosinophils, neutrophils, macrophages, lymphocytes, total IgE, IL-4, IL-5, IL-13, eotaxin, IFN- $\gamma$ , TGF- $\beta$ , IL-6, TNF- $\alpha$ , IL-1 $\beta$ , VEGF. We used a random effects model to draw a forest plot. **결과:** Through the database search and subsequent selection, 16 articles were identified. Primary outcomes were cell count and inflammatory profile. We evaluated the effects of PI3k pan-inhibitors and PI3k- $\delta$  inhibitors

as subgroups. Regarding the cell count, both the PI3k pan-inhibitors and PI3k- $\delta$  inhibitors effectively reduced the total cell count, eosinophils, neutrophils and lymphocytes. PI3k pan-inhibitors had no effect on macrophages. Regarding the inflammatory cytokines, PI3k pan-inhibitors effectively reduced total IgE, IL-4, IL-5, eotaxin, TGF- $\beta$ , TNF- $\alpha$ , IL-1 $\beta$ , and VEGF; however, PI3k pan-inhibitors had no effect on IL-13, IFN- $\gamma$ , and IL-6. PI3k- $\delta$  inhibitors effectively reduced total IgE, IL-4, IL-5, IL-13, TNF- $\alpha$ , IL-1 $\beta$ , and VEGF; however, PI3k- $\delta$  inhibitors had no effect on eotaxin and IL-6. **결론:** PI3k is a component of cell membrane phospholipids, and is responsible for a very important part of cellular and extracellular signaling. Compared to the PI3k pan-inhibitors, which block all pathways, selective PI3k- $\delta$  inhibitors are expected to be relatively less toxic. Regarding the efficacy, PI3k- $\delta$  inhibitors have at least the same or better efficacy than PI3k pan-inhibitors in effector cells and inflammatory mediators.

#### RHOP-81 11:40~11:50

### THE EFFECT OF CONCURRENT COBLATOR TURBINOPLASTY WITH ADENO- TONSILLECTOMY IN CHILDREN WITH ALLERGIC RHINITIS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, DANKOOK UNIVERSITY COLLEGE OF MEDICINE  
IN-KWON MUN, KI-YONG CHOI, YOUNG-JUN CHUNG, JI-HUN MO

**목적:** 알레르기가 편도아데노이드 절제술 후 증상 조절의 위험인자임이 알려져 있다. 비폐색 및 코골이, 구호흡은 알레르기 비염이 없는 소아에 비해 호전을 덜 보였다. 본 연구에서는 알레르기 비염 소아에서 비갑개성형술이 편도아데노이드 수술에 추가적인 증상 조절 여부를 알아보려고 하였다. **방법:** 2009년부터 2014년까지 편도아데노이드 수술을 시행한 T&A 군(131 명)과 편도아데노이드 수술과 비갑개성형술을 같이 시행받은

Turbinoplasty 추가군(78 명)을 비교하였다. 환자들의 의무기록과 수술 후 1년이 지난 이후 시행한 전화 설문으로 증상 호전 정도를 확인하여 두 그룹간 비교를 시행하였다. 전화 설문은 구호흡, 코골이, 비폐색, 비루, 가려움 및 재채기 6 항목을 Visual analogue scale을 사용하여 평가하였다. **결과:** T&A 군은 평균나이가  $6.08 \pm 2.11$  세, Turbinoplasty 추가군은  $7.96 \pm 2.06$ 세였다. 성비는 두군간 차이를 보이지 않았다. 증상 조절 확인 시점은 T&A군은  $2.05 \pm 1.09$ 년, Turbinoplasty 추가군은  $1.86 \pm 0.51$ 년 이었다. 두 군 모두 수술 후 구호흡, 코골이와 같은 무호흡 증상에서 큰 호전을 보였으며 비폐색, 비루, 가려움 및 재채기 4가지 알레르기 비염 증상도 수술 전에 비해 호전되었다. Turbinoplasty 추가군은 T&A 군에 비해 구호흡과 비폐색에서 유의하게 더 큰 증상 호전을 보였다( $p < 0.05$ ). 그리고 6 항목의 증상과 성별, 나이, 비갑개 성형술 유무, 아데노이드 크기 및 편도 크기 사이의 연관성을 알아 보기 위해 다중 선형 회귀 분석을 시행하였다. 수술전 구호흡과 코골이 및 비폐색은 편도 크기와 연관이 있었으며 수술후 구호흡과 비폐색은 비갑개 성형술 시행과 관련이 있었다. **결론:** 알레르기 비염환자에서 편도아데노이드 수술을 시행할 때 비갑개 성형술을 같이 시행하는 것이 수술후 구호흡과 비폐색과 같은 증상을 더 호전시키고 좋은 예후를 보인다는 결론을 얻을 수 있었다.

**RHOP-82 11:50~12:00**

## THE IMPACT OF FINE PARTICULATE MATTER ON CLINICAL CHARACTERISTICS OF ALLERGIC RHINITIS

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**목적:** Epidemiologic researches report adverse health effects of airborne particulate matter (PM) exposure, predominantly to the respiratory systems. This study was designed to examine the association between annual concentration of particulate matter and incidence rate, symptom severity, and duration of allergic rhinitis (AR). **방법:** From January 2007 to January 2008, we analyzed the annual average concentration of airborne particulate matter, specifically with a diameter of  $10 \mu\text{m}$  (PM 10), in 25 regions based on air quality data acquired from nearest automatic air quality monitors. Skin prick test was conducted to confirm the presence of AR. Severity and duration of allergic rhinitis were investigated based on a self-developed questionnaire. Demographics, social history, the prevalence of allergic rhinitis, number of sensitized allergens, duration, and severity of allergic rhinitis were compared and analyzed according to the level of particulate matter. **결과:** Total 8878 subjects (3858 (43.5%) male and 5020 (56.5%) female) from 25 regions were enrolled in this retrospective cohort study. The severity of AR symptoms ( $P = 0.024$ ) and the number of sensitized allergens ( $P = 0.047$ ) was significantly higher in regions with a higher level of PM 10. Symptoms were also severe in subjects sensitized to multiple allergens compared to those sensitized to only one allergen. There was a significant correlation between the concentration of PM 10 and severity of AR symptoms. However, there was no significant difference in symptom severity dependent on specific sensitization of other allergens. **결론:** Higher severity of AR symptoms and number of sensitized allergens were both observed in regions with a higher level of PM 10. Future studies on chemical properties of particulate matter and the underlying interaction between PM 10 and allergic reaction could provide clinical insights on AR

**RHOP-83 12:00~12:10****PREVALENCE AND RELATIONSHIP OF CHRONIC RHINITIS AND VITAMIN D DEFICIENCY AMONG MIDDLE- AND OLD-AGED POPULATION**DEPARTMENT OF OTOLARYNGOLOGY, AJOU UNIVERSITY  
SCHOOL OF MEDICINE

JUNG-JUN LEE, JU-HO LEE, HAN-JANG GYU, HYUN-JUN KIM, DO-YANG PARK

**목적:** Vitamin D regulates the metabolism of calcium and phosphorus, which contributes to maintaining the health of the musculo-skeletal system. The vitamin D receptor is widely distributed throughout many tissues, recent studies report that vitamin D has been shown to have an immunomodulatory effect with a significant impact on immune function. Therefore we studied the effects of vitamin D as a critical player in chronic rhinitis in middle- and old-aged population.

**방법:** Of 25534 participants in the recent 5th Korean National Health and Nutritional Examination Survey. The relationship between vitamin D levels and chronic rhinitis in the study middle age population was analyzed after adjusting for demographic characteristics, physical characteristics, lifestyle status. Multiple logistic regression was used to determine the association between vitamin D and chronic rhinitis. **결과:** Multiple logistic regression analyses were performed and there was a statistically significant ( $p < 0.05$ ) difference of Vitamin D level between groups with and without chronic rhinitis. Subjects with low vitamin D levels were more likely to have chronic rhinitis symptoms comparatively, even after adjustment for potentially confounding factors such as life style and physical status. The Vitamin D deficiency individuals not having chronic rhinitis present odds ratio of 0.79 – 0.81 (95% CI), compared with having chronic rhinitis. **결론:** After statistically controlling various related confounding variables in subjects, a significant relationship between chronic rhinitis and vitamin D deficiency was revealed.

It is necessary to further study the pathophysiology of vitamin D and chronic rhinitis with inflammation and immunomodulation process, and management of chronic rhinitis through the control of vitamin D deficiency.

**RHOP-84 12:10~12:20****SENSITIZATION TO STAPHYLOCOCCAL ENTEROTOXINS IS ASSOCIATED WITH POLY-SENSITIZATION, ALLERGIC MULTIMORBIDITY, AND ALLERGY SEVERITY**<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE, <sup>2</sup>YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINEYOUNG SUB LEE<sup>1</sup>, MIN JOO CHO<sup>2</sup>, DONG-JOON PARK<sup>1</sup>, CHI SANG HWANG<sup>1</sup>

**목적:** Evidence is accumulating Staphylococcus aureus plays an important role as disease modifier in upper and lower airway disease. We aimed to assess associations of Staphylococcus aureus enterotoxins (SEs) to allergic disease and allergic sensitization. **방법:** We retrospectively reviewed the medical records of 97 subjects and analyzed symptom scores, CT scores, serum total IgE, and specific IgE to SEs and inhalant allergens. **결과:** Sensitization to SEs was closely associated with poly-sensitization to inhalant allergens. SE-sensitized participants had a higher median total IgE levels and a higher median specific IgE value to inhalant allergens compared to non-SE-sensitized participants. SE sensitization was associated with allergic multimorbidity and severe allergic diseases such as eosinophilic chronic rhinosinusitis. **결론:** In this preliminary study suggested that sensitization to SEs may play a role in the initiation a type 2 inflammatory response and exacerbate allergic sensitization in the airway mucosa.

## HNOP 6

기관식도 I

08:00~09:00 • 세미나실2

Chairperson(s) : 조덕곤(가톨릭의대), 박일석(한림의대)

HNOP-31 08:00~08:10

## TISSUE-ENGINEERED ESOPHAGUS VIA BIOREACTOR CULTIVATION FOR CIRCUMFERENTIAL ESOPHAGEAL RECONSTRUCTION

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

EUN JAE CHUNG, HANA CHO, IN GUL KIM, WON SHIK KIM, SEONG KEUN KWON, SOON HYUN AHN

**목적:** The use of biomaterials for circumferential esophageal repair is technically challenging in a rat model, and an optimal scaffold implantation technique with nutritional support is essential. The purpose of this study was to investigate the effects of three-dimensional printed esophageal grafts and bioreactor cultivation on muscle regeneration and reepithelialization from circumferential esophageal defects in a rat model **방법:** Here, we designed an artificial esophagus that can enhance the regeneration of esophageal mucosa and muscle through the optimal combination of a two-layered tubular scaffold and mesenchymal stem cell-based bioreactor system. The graft was verified by the performance comparison with an omentum-cultured esophageal scaffold. We also applied a new surgical anastomosis technique and a thyroid gland flap over the implanted scaffold to improve graft survival **결과:** Although no regenerated mucosal layer was observed around the implants of the control group, histological examination of the

regenerative esophagi along the scaffold revealed that the bioreactor system and omentum-cultured groups showed more than 80% of the mucosal regeneration without a fistula. The regenerated tissues showed that the integration of the esophageal scaffold and its native esophageal tissue was intact and were covered with layers of stratified squamous epithelium with several newly developed blood vessels **결론:** This study describes a novel approach for circumferential esophageal reconstruction

HNOP-32 08:10~08:20

## ANALYSIS OF PROGNOSTIC FACTORS AFFECTING SURVIVAL RATE AND RECURRENCE RATE IN ORAL CAVITY CANCER PATIENTS

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**목적:** AJCC 8TH guideline에서는 HPV 유무에 따른 구인두암의 staging을 구분하였으며 HPV가 있는 군에서 생존율이 더 높으며 예후가 좋은 것으로 여러 논문에서 확인되어 왔다. 여기서는 구강암에서 중요한 예후인자인 흡연과 음주 외에도 HPV 유무에 따른 생존율과 재발율의 차이를 비교해보고자 한다. **방법:** The Cancer Genome Atlas의 두경부암 코호트 중 구강암으로 진단 뒤 수술을 받고 경과 관찰 중인 298명의 환자들 대상으로 하였다. 흡연, 음주, HPV 유무, 성별 차이에 따른 5년 생존율과 5년 재발율을 비교하였다. 또한 Clinical staging 상 stage III, IV 내에서 위의 인자들에 대해 다시 비교하여 진행된 암종에서 생존율에 영향을 끼치는 인자를 같이 알아보고자 하였다. **결과:** HPV는 구강암 환자의 7.89%에서 동정되었으며 5년 생존율 및 재발율 차이는 없었다. 흡연 유무 및 성별 차이에 따른



생존율 및 재발율의 차이도 발견되지 않았다. 한편 음주 유무에 따라서 비교해 보았을 때 생존율에서는 차이가 없었으나 음주를 한 군에서 5년 재발율이 유의하게 증가하는 양상을 보였다. ( $p=0.028$ ) 진행된 암종인 Stage III, IV 에서도 음주를 한 군에서 안 한 군에 비해 재발율이 유의하게 증가하였다. ( $p=0.006$ ) **결론:** 구강암 수술 후에도 과거 음주 병력이 있는 경우는 재발율이 증가하므로 이에 대해서 더 적극적인 관찰이 필요하며, 과거 흡연 병력이 있는 경우 본 연구에서는 수술 후 재발율과 생존율 차이는 보이지 않았으나 흡연 기간 및 하루 흡연량에 따라 차이가 나타날 수 있으므로 더 자세한 연구가 필요하다.

#### HNOP-33 08:20~08:30

### OPERATIVE OUTCOMES OF ANTERIOR MEDIASTINAL TRACHEOSTOMY FOR CERVICOTHORACIC MALIGNANCIES

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**목적:** This study was performed to evaluate the early operative outcomes of anterior mediastinal tracheostomy, after radical resection for cervicothoracic malignancies. **방법:** Between 2012 and 2019, 10 patients received the anterior mediastinal tracheostomy due to the cervical esophageal cancer or head and neck cancers. The retrospective reviews of medical records were done. **결과:** The median age of patients was 63 years-old (range, 45~70) with 6 male patients. The indications of operation were as follows; four thyroid cancers, two cervical esophageal cancers, two hypopharyngeal cancers and two glottis cancers.

Seven patients received the salvage operation after definitive chemoradiation therapy. After procedure, the satisfactory airway was achieved in all patients without proximal airway obstruction. There were 2 cases of in-hospital mortalities; both of mortalities were related to the bleeding with vascular insufficiency. Complications were developed in 6 patient; three post-operative bleedings, one trachea-esophageal fistula, one pharyngo-cutaneous fistula and one stroke. The median hospital day was 55 days (range, 34~191). During the median 5 months, 5 patients suffered from the cancer recurrence. **결론:** Anterior mediastinal tracheostomy showed high mortality rate and mainly related to the vascular accidents. Careful selection of patients and intraoperative procedures to prevent complications are needed to improve the operative outcomes.

#### HNOP-34 08:30~08:40

### RESPIRATORY TRACT BACTERIAL COLONIZATION AFTER TRACHEOTOMY IN PEDIATRIC PATIENTS: COMPARISON BETWEEN LARYNGEAL AND TRACHEOSTOMA SITE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL  
YOUNG SEOK KIM, SEONG KEUN KWON

**목적:** Tracheostomy lead to persistent bacterial colonization of the respiratory tract in most chronically cannulated subjects. Surgical site infection and restenosis by the pathologic bacteria is the most fatal complication after open airway surgery. The aim of this study is to describe the culture results of larynx and tracheostoma in patients with tracheostomy history. **방법:** Retrospective review of patients who had simultaneous larynx and trans-tracheostomal culture in operation theater was performed. Mean age at tracheostomy and mean duration of tracheostomy

were compared between presence group and absent group by antibiotic-resistant bacteria. Results of culture in larynx and tracheostoma were compared. **결과:** A total of 18 patients was included. Mean age at tracheostomy was  $4.9 \pm 5.7$  months. Mean duration of tracheostomy was  $47.7 \pm 26.7$  months. Totally 5 pathologic bacteria were identified in 11 patients out of 18 patients; methicillin-resistant *S. aureus* (16.7%), ceftriaxone-resistant streptococcus (38.9%), ESBL producing *Klebsiella pneumoniae* (11.1%), *Pseudomonas* (33.3%), *S. pneumonia* (5.6%). Among them, only ceftriaxone-resistant streptococcus in larynx showed significant relationship with age at tracheostomy ( $p=0.032$ ). Among 18 patients, 13 patients showed the same culture result between larynx and tracheostoma, two showed broader results in tracheostoma, and one showed broader result in larynx. In remaining two patients, *pseudomonas* was identified in tracheostoma and ceftriaxone-resistant streptococcus was identified in larynx. **결론:** 61.1% of pediatric patients with tracheostomy showed pathologic bacteria in laryngeal or tracheal site, which shows the need of preoperative respiratory tract culture and perioperative antibiotics according to the culture. Presence of pathologic bacteria in respiratory tract showed little relationship with age at tracheostomy and duration of tracheostomy. Trans-tracheostoma culture was enough to decide perioperative antibiotics in 17 patients out of 18.

#### HNOP-35 08:40~08:50

### ADJUVANT RE-IRRADIATION AFTER SALVAGE SURGERY OF THE RECURRENT HYPOPHARYNGEAL CANCER

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, REPUBLIC OF KOREA

MINHAE PARK, WOORI PARK, YOUNG-IK SON

**목적:** Salvage treatment of the residual/recurrent hypopharyngeal cancer is always challenging. Salvage surgery is a standard of care in patients who already received radiation therapy (RT). Despite the most of salvage surgeries warrant adjuvant treatment because of the high risk features including positive margin, extracapsular spread, and perineural or lymphovascular invasion, there are great controversies on oncological benefits vs. RT-related toxicities of adjuvant re-irradiation. **방법:** A single institutional database of the last 20 years was reviewed. Total 59 patients with recurrent hypopharyngeal cancer were enrolled for this study, who received curative salvage surgery after previous definitive RT, CCRT, or postoperative adjuvant RT. Among 59 patients, 48 patients underwent salvage surgery alone and 11 patients received adjuvant re-RT after salvage surgery. The oncological outcomes and RT-related complications were compared between the two groups. **결과:** Three-year overall survival rate was not different between the two groups ( $p = 0.78$ ); 50% and 54% for without and with adjuvant re-RT, respectively. Distant metastasis rate was similar (8% vs. 9%). Local recurrence rate was lower in the adjuvant re-RT group (39.5% vs. 9%). Unexpectedly, wound complications (fistula, infection, or PEG/PRG dependency) were more common in the without re-RT group, which probably means that adjuvant re-RT was not feasible in a part of re-RT candidate patients because of postoperative wound complications. RT-related mortality or intractable RT-induced necrosis was not found in our series. **결론:** Despite the possibility of increase in re-RT related toxicities and no significant impact on overall survival, adjuvant re-RT may improve loco-regional control or disease free survival after salvage surgery in recurrent hypopharyngeal cancer patients.

## HNOP 7

두경부/갑상선/후두음성 기초 및 중개연구 III

08:00~09:00 • 세미나실4

Chairperson(s) : 조재구(고려의대), 은영규(경희의대)

### HNOP-36 08:00~08:10

#### CIRCULATING TUMOR DNA MUTATION PROFILING IN SALIVA AND PLASMA IN PATIENTS WITH HEAD AND NECK CANCER BEFORE AND AFTER SURGERY : A PILOT REPORT

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YOUNGCHAN LEE<sup>1</sup>, HYUKJUNG KWON<sup>2</sup>, SUNGHOON LEE<sup>2</sup>, YOUNG-GYU EUN<sup>1</sup>

**목적:** Circulating tumor DNA (ctDNA) provides information on specific tumor- and metastasis-related alterations. There is still a lack of research on the analysis of tumor specific mutated DNA in saliva. In this prospective study, we aimed to investigate the changes in ctDNA mutation profiling in saliva and plasma after surgical resection in head and neck squamous cell carcinoma (HNSCC) patients. **방법:** This study included 7 patients with HNSCC underwent surgical treatment. Tumor tissues and preoperative and postoperative saliva and blood samples were collected from each patient. Somatic mutations in tumor DNA (tDNA) were identified by targeted sequencing (QIAseq Comprehensive cancer panel, 275 genes) or whole exome sequencing (WES). The mutation profiles and dynamic changes in saliva and plasma cell free DNA (cfDNA) for each patient were analyzed with primers designed by these sequencing data using targeted amplicon seq. **결과:** Of 7 enrolled

HNSCC patients, 3 were tongue cancer, 2 tonsil cancer, and 2 laryngeal cancer. According to the results of the targeted seq, 3-8 mutations (single nucleotide variants/ indels) were selected to construct different primer sets for each patient, or 12 mutations according to the results of WES. The result of deep sequencing with cfDNA of preoperative sample in individually customized panel showed that ctDNA was detected in 3 plasma (42.8%) and 5 saliva (62.5%). We compared the mutation profiling of ctDNA in saliva and plasma before and after surgery. There was no consistent decrease in mutant allele frequency (MAF) of ctDNA in plasma after surgery. In one of the saliva samples, postoperative MAF for all mutations were reduced compared to preoperative MAF. **결론:** We developed patients-specific ctDNA assay based on detection of somatic mutation identified from primary tumor in saliva and plasma. Our results indicate that mutation detection in cfDNA can vary among HNSCC patients, and more effective approach might be required to analyze the ctDNA in saliva.

### HNOP-37 08:10~08:20

#### HOXB5 ACTS AS ONCOGENIC DRIVER IN HEAD AND NECK SQUAMOUS CELL CARCINOMA VIA EGFR/AKT/WNT/B-CATENIN SIGNALING AXIS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, RESEARCH INSTITUTE FOR MEDICAL SCIENCES, CHUNGNAM NATIONAL UNIVERSITY COLLEGE OF MEDICINE, DAEJEON, REPUBLIC OF KOREA

JAEWONCANG, KYUNGMINLEE, OH CHAN, LIHUA LIU, SEUNG-NAM JUNG, HO-RYUNWON, YOUNGILKIM, BONSEOKKOO

**목적:** Although HOXB5 is expressed in oral squamous cell carcinoma cells, the role and molecular mechanism of HOXB5 remain unclear. Here, we investigated the expression pattern and functional role of HOXB5

in HNSCC to determine its potential role in carcinogenesis. **방법:** Raw data from HNSCC patients were downloaded from the UCSC Xena browser (<https://xenabrowser.net/>). We downloaded gene expression data from the Cancer Cell Line Encyclopedia (CCLE; <https://portals.broadinstitute.org/ccle>). The human HNSCC cell lines YD-8 and SCC-15 were used in the whole in vitro experiments including RT-PCR, Western blotting, siRNA transfection, proliferation, migration, and invasion assays. Our in vitro results were confirmed in the both nude mouse xenograft and Drosophila models. **결과:** The Cancer Genome Atlas (TCGA) data shows that HOXB5 is overexpressed in HNSCC compared to normal tissues and significantly associates with tumor stage ( $P = 0.003$ ), lymph node metastasis ( $P = 0.031$ ), disease stage ( $P = 0.002$ ), and angiolymphatic invasion ( $P = 0.004$ ). Our results also show that HOXB5 expression is up-regulated in HNSCC cell lines, and HOXB5 knockdown significantly reduced cell proliferation and tumor growth in vitro and in vivo. HOXB5 suppression reduces cell migration and invasion via down-regulation of epithelial-to-mesenchymal transition-associated proteins. Moreover, HOXB5 directly binds to promoter region of EGFR, and consequently regulates the activity of the Akt/Wnt/ $\beta$ -catenin signaling axis. **결론:** Our findings indicate that HOXB5 promotes cell proliferation and motility in HNSCC by regulating EGFR expression at the transcriptional level.

#### HNOP-38 08:20~08:30

### APPLICATION OF AN INTRAOPERATIVE NEUROMONITORING SYSTEM USING SURFACE PRESSURE SENSOR IN PAROTID SURGERY: A RABBIT MODEL STUDY

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OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, PUSAN NATIONAL UNIVERSITY HOSPITAL

EUI-SUK SUNG<sup>1</sup>, SUNG-CHAN SHIN<sup>2</sup>, HYUN-GEUN KWON<sup>1</sup>, YOUNG-IL CHEON<sup>2</sup>, JIN-CHOON LEE<sup>1</sup> BYUNG-JOO LEE<sup>2</sup>

**목적:** Facial nerve palsy is the most serious complication of parotidectomy. So intraoperative neuromonitoring (IONM) is needed to confirm the identification and status of the nerve during parotidectomy. However, the risk of nerve damage may occur due to false negatives or false positive responses of IONM during these surgery. Therefore, instead of using EMG to identify the location and state of the facial nerves, we applied an IONM system using surface pressure sensor to detect facial muscle twitching. The objective of this study was to investigate the feasibility of novel IONM system using surface pressure sensor during parotidectomy. **방법:** We evaluated the stimulus thresholds to detect orbicularis oris and oculi muscle twitching, as well as the amplitude and latency of electromyography (EMG) and surface pressure sensor recordings in ten facial nerves of five rabbits, according the same stimulus intensity. **결과:** The surface pressure sensor detected orbicularis oris and oculi muscle twitching in response to 0.1mA stimulation of all ten facial nerves. No difference was observed in the stimulus intensity thresholds of stimulus intensity between surface pressure sensor and EMG recordings to detect facial muscle twitching. **결론:** The application of IONM using a surface pressure sensor during facial nerve dissection is noninvasive, safe, and feasible. Instead of recording an EMG response, measuring muscle twitching to identify the state of facial nerve can be an alternative to the novel IONM system.

#### HNOP-39 08:30~08:40

### WOUND HEALING PROMOTING ACTIVITY OF TON-

## SIL-DERIVED STEM CELLS ON 5-FLUOROURACIL-INDUCED ORAL MUCOSITIS MODEL

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HARRY JUNG<sup>1</sup>, SUNG MIN LEE<sup>2</sup>, KANG HYUN LEE<sup>2</sup>, SANG WOOK KIM<sup>2</sup>, KI JOON PARK<sup>2</sup>, HAE SANG PARK<sup>1,2</sup>

**목적:** We first determined the efficacy of lesional injection of tonsil-derived mesenchymal stem cells for the treatment of 5-fluorouracil induced oral mucositis. **방법:** Oral mucositis was induced in hamsters by administration of 5-fluorouracil (day 0, 2, 4) followed by mechanical trauma (day 1, 2, 4). The experimental groups included MT (mechanical trauma only), 5-FU+MT (mechanical trauma with 5-fluorouracil administration), TMSC (mechanical trauma with 5-fluorouracil administration, tonsil-derived mesenchymal stem cells injection), DEXA (mechanical trauma with 5-fluorouracil administration, dexamethasone injection), and saline (mechanical trauma with 5-fluorouracil administration, saline injection). **결과:** On day 10, gross and histologic analyses showed that nearly complete healing and epithelialization of the cheek mucosa of the TMSC group, whereas the other groups showed definite ulcerative lesions. Compared with the MT and DEXA groups, CD31 expression was greater in the TMSC group on days 10 and 14. In addition, the TMSC group showed higher expression of TGF- $\beta$ , and NOX4 on day 10 compared with the other groups. **결론:** Intralesional administration of tonsil-derived mesenchymal stem cells may accelerate wound healing of 5-fluorouracil induced oral mucositis by upregulating neovascularization and effective wound contraction.

HNOP-40 08:40~08:50

## POLYETHYLENE GLYCOL BASED VOCAL FOLD AUGMENTATION MATERIAL

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CHOUNG-SOO KIM<sup>1</sup>, HYUNSU CHOI<sup>2</sup>, SUNGWON KIM<sup>1</sup>, HEEBEOM KOO<sup>3</sup>

**목적:** : long-term vocal fold augmentation materials must be biostable, remain at the site of injection. In this study, we explore polyethylene glycol(PEG) as vocal augmentation material **방법:** Sixteen rabbit were injected in the lateral aspect of their right thyroarytenoid muscle with 0.3cc of PEG or calcium hydroxyapatite(CaHA) 1 week after Right recurrent laryngeal nerve section. Endoscopic examinations were conducted at 4,8 and 16weeks after injection. Then larynges were harvested, High speed video camera examination was done for comparing degree of medialization of paralyzed vocal fold between PEG and CaHA. we also conduct histological and immunohistochemical examination **결과:** Endoscopic examinations showed that Injected PEG remained well in the paralyzed vocal fold without significant decrease after 16 weeks than CaHA group. there were no inflammatory response both group, glottic gaps were decreased in PEG group. Histology performed 16 weeks after injection. Injected PEG remained at the injected site, whereas CaHA migrated surround area. There were no inflammatory response in the surround tissue nearby injected site The residual volume was larger in the PEG group than CaHA group **결론:** PEG could be new candidate for vocal fold injection material

## HNOP-41 08:50~09:00

## CLINICAL FEATURES OF DEEP NECK INFECTIONS IN LARGE NUMBERS OF PATIENTS OVER MANY YEARS

DEPARTMENT OF OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE

JAE WOO JOO

**목적:** To identify demographic and laboratory findings of patients with deep neck infection and to find out the **방법:** This study is retrospective study with chart review. Patients who visited Korea University Ansan Hospital between May 2002 and May 2019 were analyzed for the study. The participants were diagnosed with L02.10, L02.00 (Cutaneous abscess of head or neck) or J39.0. (Retropharyngeal or parapharyngeal abscess) All of the patients were hospitalized and had blood and urine tests including complete blood count within 24 hours. **결과:** Demographic results A total of 502 patients were evaluated. Among the patients, 456(91%) were adults over 18 years old were identified. Seventy percent of the patients were males. The most common Involvement site was parapharyngeal space. There were 257 (51%) patients who underwent surgery, 90 (18%) patients with diabetes and 120 (24%) patients with hypertension. The mean hospital stay for patients was 9.9 days  $\pm$  7.2 days. Laboratory results In the case of Complete Blood Count, 502 patients were analyzed and the average Hb 13.7  $\pm$  1.8, WBC 14,700  $\pm$  5800, and Platelet 270,700  $\pm$  96,100 were identified. There were 484 patients for coagulation evaluation. The mean aPTT(sec) was 31.7  $\pm$  4.9, PT (sec) was 12.7  $\pm$  1.4, PT (INR) was 1.1  $\pm$  0.1, PT (%) was 88.0  $\pm$  15.1. The clinical chemistry was analyzed by 463 patients. The average value of protein and albumin were 7.0  $\pm$  0.8 and 4.0  $\pm$  0.5 respectively. The mean value of AST was 25.3  $\pm$  13.6, ALT was 25.9  $\pm$  23.3, ALP was 87.7  $\pm$  44.3, Glucose was

135.8  $\pm$  58.8, CRP was 11.8  $\pm$  11.0, BUN was 15.0  $\pm$  7.9, Cr was 0.80  $\pm$  0.28, Na was 138.1  $\pm$  3.5, K was 4.0  $\pm$  0.4, Cl was 100.9  $\pm$  4.2 and Ca was 9.0  $\pm$  0.6. **결론:** The demographic and laboratory data of a large number of Deep neck infection patients were analyzed. Factors influencing the duration of admission for patients with deep neck infection were DM, HTN, op implementation status, whether multiple involvement site or not, CRP, albumin, and WBC count.

## HNOP 8

기관식도 II

09:00~10:00 • 세미나실2

Chairperson(s) : 김용희(울산의대), 최승호(울산의대)

## HNOP-42 09:00~09:10

## MULTILAYERED FUNCTIONAL REGENERATION OF ESOPHAGUS IN A BEAGLE MODEL VIA CUSTOM-DESIGNED BIOREACTOR CULTIVATION OF SYNTHETIC SCAFFOLD

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

EUN-JAE CHUNG, IN GUL KIM, HANA CHO, WON SHIK KIM, SEONG KEUN KWON, SOON-HYUN AHN

**목적:** The purpose of this study was to evaluate the potential of an artificial esophagus that can enhance the regeneration of esophageal mucosa and muscle through the optimal combination of a double-layered tubular scaffold and novel custom-designed MSC-based bioreactor system in a beagle model. **방법:** We fabricated a novel double-layered tubular scaffold as

an artificial esophagus using electrospinning technique. The tubular scaffolds were visualized using a scanning electron microscopy. Prior to transplantation, human-derived mesenchymal stem cells were seeded into the lumen of the scaffold, and bioreactor cultivation was performed to enhance cellular reactivity. After 3 days of cultivation using a bioreactor system, tissue-engineered artificial esophagus were transplanted into a partial esophageal defect (5X3cm) in a beagle model. The graft area was covered with a peripheral muscles. **결과:** From the SEM analysis, electrospun fibres in a tubular scaffold were found to be randomly and circumferentially oriented for the inner and outer surfaces, respectively. Complete recovery of esophageal mucosa was confirmed by endoscopic analysis and SEM. Micro-CT analysis also showed that there was no leakage of saliva into the esophagus. Significant regeneration of the mucosal layer was observed by keratin 5 immunostaining. In particular, hyperplasia of esophageal gland was frequently observed in the regenerated submucous layer. From the  $\alpha$ -SMA immunostaining, esophageal muscle regeneration was significantly increased in the 12 months graft compared with the 6 months graft. The neovascularization increased significantly in the 6- and 12-month graft compared to the normal group. **결론:** We created a new viable model for multilayered functional regeneration of esophagus. This study describes a promising approach for upper digestive tract reconstruction.

**HNOP-43 09:10~09:20**

### **PREDICTION OF PHARYNGO-CUTANEOUS FISTULA AFTER TOTAL LARYNGECTOMY USING CONVENTIONAL STATISTICS AND MACHINE LEARNING ANALYSIS**

DEPARTMENT OF OTORHINOLARYNGOLOGY - HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE

WOORI PARK, BOKHYUN SONG, NAYEON CHOI, YOUNG-IK SON

**목적:** Pharyngocutaneous fistula (PCF) after total laryngectomy (TL) is a major complication which increases morbidity and mortality. We investigate PCF-related risk factors and analyzed using conventional logistic regression and predict the probability of PCF by random forest machine learning model. **방법:** The patients who received TL with acceptable medical records were included (N=313). They were classified into no PCF (n=247) and PCF group (n=66). We compared over 50 clinical variables between the two groups and identified risk factors for PCF by conventional logistic regression and developed random forest machine learning model for prediction of PCF after TL. **결과:** Age, sex, tumor location, preoperative albumin, BMI, transfusion, and ASA were not significantly different between the two groups. T, N and overall stage, previous radiation and neoadjuvant chemotherapy were not also different. Operation extent (primary tumor and neck nodes), simultaneous proximal insertion and reconstruction methods (primary closure, use of flaps, types of free flaps) had no significant difference. Preoperative hemoglobin was higher in no PCF group, and smoking, hypertension and chronic kidney disease were higher in PCF group. Previous CCRT and positive resection margin were more frequently observed in PCF group. In logistic regression, age, hypertension, and primary tumor location (hypopharynx) were identified as risk factors for PCF. The prediction of PCF using random forest machine learning logic was performed and it provided a high sensitivity (0.90), specificity (0.82) and prediction rate (0.82). **결론:** Age, hypertension, and primary tumor location were identified as risk factors for PCF after TL by conventional analysis. In addition, machine learning model to predict PCF showed fair performance and could be easily employed by clinicians.

18월 (금)

본과 및 유관학  
회 포스터 발표

Education  
Program

이과 구역  
(OTOP)

비과 구역  
(RHOP)

두경부 구역  
(HNOP)

TPP

HNOP-44 09:20~09:30

### THORACOSCOPIC LOBECTOMY WITH MULTI-JOINT ARTICULATING ENDOSCOPIC INSTRUMENT IN ANIMAL MODEL - PILOT STUDY

DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE

HYUN-KOO KIM

**목적:** Some of the significant advantages experienced by surgeons using the robot-assisted surgical system have been an enhanced range of motion, improved dexterity, and three-dimensional visualization. In this study, we evaluated a newly developed articulating device for VATS lobectomy mimicking the movement of instruments in robot-assisted surgery. **방법:** In the canine model, we performed VATS lobectomy using newly developed multi-joint articulating devices which allow synchronized movement of the surgeon's fingers and wrist. We evaluated its feasibility for current surgical practice, such as thoracoscopic lobectomy with mediastinal lymph node dissection. **결과:** During lobectomy, we tested articulating movement, accessibility to target, and coordination with hand and wrist's movements. This multi-joint articulating device showed excellent performance and played similar actions, such as those of robot instruments. This tool might provide surgical accuracy and precision in conventional VATS surgery and allows the surgeon to perform more complex techniques such as sleeve resection or vascular procedure during VATS surgery. **결론:** The use of multi-joint articulating instruments for VATS in the animal model showed excellent articulation and feasibility during surgery. Future study is needed to evaluate the performance and usefulness for VATS surgery in human.

HNOP-45 09:30~09:40

### CLINICAL FEASIBILITY AND EFFICACY OF MRI LYMPHANGIOGRAPHY AND THORACIC DUCT EMBOLIZATION (TDE) IN THORACIC SURGERY-RELATED CHYLE LEAK

DEPARTMENT OF THORACIC AND CARDIOVASCULAR SURGERY, ASAN MEDICAL CENTER, ULSAN UNIVERSITY COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

FAHD AL ABBOOD, SEUNGMO YOO, YONG-HEE KIM

**목적:** Most diagnostic imaging methods were not appropriate to provide anatomical information for chylothorax after thoracic surgery. The conventional managements of chylothorax cannot predict the duration or the outcomes of treatment. The conventional mass ligation of thoracic ducts for chylothorax has the disadvantages of burden of reoperation. In this study, we investigated the clinical feasibility of MRI lymphangiography and clinical efficacy of embolization of thoracic ducts. **방법:** Between July 2017 and July 2019, 13 patients underwent MRI lymphangiography, with thoracic duct embolization (TDE), for thoracic surgery-related chyle leak, 12 patients had Chylothorax, and one had chyloperitoneum. They underwent MRI lymphangiography with TDE for thoracic surgery-related refractory chyle leak. We conducted a retrospective review of patient clinical medical and operation records for preoperative and postoperative details. **결과:** Site of leak was identified by MRI lymphangiography in 9 patients, 4 patients had no contrast leak. All patients underwent embolization of thoracic duct. Median Pre-embolization drain output 430ml (range, 90-1350), median Post-embolization drain output 140ml (range, 60-310), with a median reduction percentage of 60.6% (range, 0-89.5). Median duration till removal of drain after TDE was 8 days (range, 3-29), median length of stay was 32 days (range, 11-147), with median pre-embolization LOS of 16 (range, 3-32), and median post-embolization LOS



of 8 (range, 4–32). Eleven patients recovered fully and discharged home, 1 patient died on postoperative day 48, and one patient transferred to another facility on postoperative day 146. **결론:** MRI lymphangiography for chyle leak could provide appropriate anatomical information of injury site. The embolization of thoracic duct could be safe and effective option of chyle leak managements.

#### HNOP-46 09:40~09:50

### 3D-PRINTABLE PHOTOCURABLE BIOINK FOR LARYNGEAL CARTILAGE REGENERATION OF TONSIL-DERIVED MESENCHYMAL STEM CELLS

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, CHUNCHEON SACRED HEART HOSPITAL, SCHOOL OF MEDICINE, HALLYM UNIVERSITY, CHUNCHEON, REPUBLIC OF KOREA, <sup>2</sup>NANO-BIO REGENERATIVE MEDICAL INSTITUTE, SCHOOL OF MEDICINE, HALLYM UNIVERSITY, CHUNCHEON, REPUBLIC OF KOREA, <sup>3</sup>INSTITUTE OF NEW FRONTIER RESEARCH TEAM, HALLYM UNIVERSITY, HALLYM CLINICAL AND TRANSLATION SCIENCE INSTITUTE, CHUNCHEON, REPUBLIC OF KOREA

HAE SANG PARK<sup>1,2,3</sup>, JI SEUNG LEE<sup>2</sup>, HARRY JUNG<sup>3</sup>, CHAN HUM PARK<sup>1,2</sup>

**목적:** Three-dimensional (3D) bioprinting has gained significant attention in the field of tissue engineering and is a promising technology to overcome current difficulties in cartilage regeneration. Gelatin and hyaluronic acid (HA) have been shown to be ideal biomimetic hydrogel sources for cartilage regeneration. However, controlling their structure, mechanical properties, biocompatibility, and degradation rate for cartilage repair remains a challenge. Here, we show a photocurable bioink created by hybridization of gelatin methacryloyl (GelMA) and glycidyl-methacrylated HA (GMHA) for material extrusion 3D bioprinting in cartilage regeneration. **방법:** We engineered various

formulations of GelMA/GMHA bioinks, and tested their functions in vitro (rheological, mechanical properties, printability, and cell viability). Furthermore, we tested in vitro & in vivo chondrogenesis of tonsil-derived mesenchymal stem cells (TMSCs) laden GelMA/GMHA bioinks (GAG assay, RT-PCR, animal implantation study). Animal transplantation study using laryngectomized rabbit model was performed. **결과:** The mixture of 7% GelMA and 5% GMHA bioink (G7H5) demonstrated the most reliable mechanical properties, rheological properties, and printability. This G7H5 bioink allowed us to build a highly complex larynx structure, including the hyoid bone, thyroid cartilage, cricoid cartilage, arytenoid cartilage, and cervical trachea. This bioink also provided an excellent microenvironment for chondrogenesis of TMSCs in vitro and in vivo. Transplanted thyroid and cricoid cartilage scaffolds using TMSCs laden G7H5 bioink in laryngectomized rabbit showed successful engraftment. **결론:** This study presents the ideal formulation of GelMA/GMHA hybrid bioink to generate a well-suited photocurable bioink for laryngeal cartilage regeneration of TMSCs using a material extrusion bioprinter, and could be applied to cartilage tissue engineering.

## HNOP 9

내시경/로봇수술

09:00~10:00 • 세미나실4

Chairperson(s) : 태경(한양의대), 이세영(중앙의대)

#### HNOP-47 09:00~09:10

### THE FIRST HUMAN TRIAL OF TRANSORAL ROBOTIC SURGERY USING A SINGLE PORT ROBOTIC

18일 (금)

분과 및 유관 학회 포스터 발표

Education Program

이과 구역 (OTOP)

비과 구역 (RHOP)

두경부 구역 (HNOP)

TPP

## SYSTEM IN THE TREATMENT OF LARYNGO-PHARYNGEAL CANCER

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

YOUNG MIN PARK, DA HEE KIM, MIN SEOK KANG, JAE YOL LIM, EUN CHANG CHOI, YOON WOO KOH, SE-HEON KIM

**목적:** The purpose of this study was to evaluate the feasibility and safety of the DaVinci SP system for performing transoral robotic surgery (TORS) in head and neck cancer patients. **방법:** From October 2018 to December 2018, we retrospectively reviewed the medical records of 41 patients who underwent TORS using the DaVinci SP system. **결과:** During TORS, three robotic arms could be used to perform a geometric resection of the lesion in a narrow working space. The mean total operation time was 60 minutes and the average time required to set up the robotic system was within 10 minutes. All patients successfully underwent TORS. All robotic arms were inserted through a single arm, which widened the working space around the patient's head and allowed for the operative assistant to easily approach the patient during operation. The joggle joint of the robotic arms aided in easy manipulation within the confined working space. Joggle joints of the endoscopic arm were controlled through the navigation system, which was very helpful in securing the superior visualization of the surgical site, especially in the area of larynx and hypopharynx. **결론:** We confirmed that DaVinci SP provided us technical advantages above the Si/Xi systems for performing TORS. Especially, it was helpful to ensure proper visualization of the surgical field and to perform precise surgery when operating the tongue-base or the hypopharyngeal lesion.

HNOP-48 09:10~09:20

## A MODIFIED PROCEDURE OF TRANSORAL ROBOTIC SURGERY TOTAL LARYNGECTOMY USING A SINGLE PORT FLEXIBLE ROBOTIC SYSTEM

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA,

<sup>2</sup>INSTITUTE OF LOGOPEDICS AND PHONiatrics, YONSEI UNIVERSITY COLLEGE OF MEDICINE, GANGNAM SEVERANCE HOSPITAL, SEOUL, KOREA

YOUNG MIN PARK<sup>1</sup>, DA HEE KIM<sup>1</sup>, MIN SEOK KANG<sup>1</sup>, MOHAMMED ABDULRAHMAN ALHASHIM<sup>1</sup>, JAE YOL LIM<sup>1,2</sup>, EUN CHANG CHOI<sup>1</sup>, SE-HEON KIM<sup>1</sup>, YOON WOO KOH<sup>1</sup>

**목적:** In this study, we designed the transoral robotic surgery (TORS)-total laryngectomy (TL) surgical technique using the DaVinci SP system and performed it on laryngeal cancer patients and report its usefulness and safety. **방법:** A 71 male patients with laryngeal squamous cell carcinoma (T3N0M0) received TORS-TL using DaVinci SP system. **결과:** The transoral and transcervical phases of TORS-TL procedure were performed using robots, and proper surgical field and workspace could be secured and operation was completed successfully. The operation time was 3 hours and 5 minutes and blood loss was 120cc. Postoperative pathologic examination showed negative surgical resection margins and perineural invasion, but no other adverse features. On the 12th day after the operation, pharyngogram was performed to confirm that there was no leakage and oral diet was started. The patient was discharged on the 15th postoperative day, tolerable to the general diet. No complications occurred during or after surgery. The pharyngeal mucosa suture line is minimized because the TORS-TL can preserve a significant amount of supraglottic laryngeal mucosa more than the open TL method. It also has the advantage of reinforcing the pharyngeal suture line by preserving the infrahyoid strap muscle.

These advantages are expected to minimize the risk of pharyngocutaneous fistula, especially in salvage cases.

**결론:** Based on our early experiences of TORS-TL using DaVinci SP, we confirmed that the latest system provided us far advanced technical advantages above previous DaVinci system in performing TORS-TL.

#### HNOP-49 09:20~09:30

### TRANSORAL ROBOTIC THYROIDECTOMY - INITIAL EXPERIENCES & LEARNED FROM COMPLICATIONS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, BIOMEDICAL RESEARCH INSTITUTE, PUSAN NATIONAL UNIVERSITY SCHOOL OF MEDICINE, PUSAN NATIONAL UNIVERSITY HOSPITAL, PUSAN, REPUBLIC OF KOREA

SUNG-CHAN SHIN, HAN-SEUL NA, HWA-BIN KIM, JIA KIM, YUMI LEE, MIN-GYU JO, BYUNG-JOO LEE

**목적:** Transoral thyroidectomy is recently accepted as an ideal approach of minimally invasive thyroidectomy. Due to the limited accessibility of the robotic system, transoral endoscopic thyroidectomy (TOET) tends to be performed more globally than transoral robotic thyroidectomy (TORT). In this study, we analyzed the perioperative surgical outcomes of the first 5 cases of TORT compared to 25 cases of TOET. **방법:** Between May 2019 and August 2019, 5 patients were underwent TORT in Pusan National University Hospital. Perioperative surgical outcomes were analyzed and compared to 25 cases of TOET performed between December 2016 and April 2019. **결과:** All of 5 cases of TORT were successfully performed. There was no conversion to open surgery, vocal fold palsy, skin burn in TORT and tearing of corner of mouth. Operation time was longer in TORT compared to TOET. Postoperative pain and hospital stay were similar in both TORT and TOET. **결론:** TORT is thought

to be an ideal approach among the minimally invasive thyroid surgery. TORT is thought to be more superior to TOET in the respects of assist independency, more stable vision and counter traction using fourth arm.

#### HNOP-50 09:30~09:40

### RETROAURICULAR SELECTIVE NECK DISSECTION IN CNO ORAL CANCER PROVED ONCOLOGIC SAFETY AND EFFECTIVENESS THROUGH 10 YEARS OF SURGICAL OUTCOMES

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE,

<sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE,

<sup>3</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE<sup>3</sup>

JI HOON KIM<sup>1</sup>, JAE HONG PARK<sup>2</sup>, MIN SEOK KANG<sup>3</sup>, DA HEE KIM<sup>3</sup>, YOUNG MIN PARK<sup>3</sup>, MOHAMMED ABDULRAHMAN ALHASHIM<sup>3</sup>, SE-HEON KIM<sup>3</sup>, EUN CHANG CHOI<sup>3</sup>, YOON WOO KOH<sup>3</sup>

**목적:** This study aimed to verify the oncological safety of retroauricular neck dissection (RAND) compared with transcervical neck dissection (TCND) in clinically negative (cN0) oral squamous cell carcinoma (OSCC) patients. **방법:** This is a retrospective study of 205 cN0 OSCC patients who underwent transoral wide excisions for primary lesion with selective neck dissection (SND) (level I-III) via conventional TCND or RAND between Jan 2011 and Aug 2019. Comparisons between 2 groups were made for peri- and postoperative complications, recurrence, disease free survival (DFS), and overall survival (OS). **결과:** Of the 205 patients included in the study, 144 and 61 underwent TCND and RAND, respectively. The mean follow-up period was 42.2 months for TCND and 43.6 months for RAND. There were almost no differences in the peri- and postoperative outcomes

between groups. However, the RAND group showed a longer operation time than the TCND group and a high level of satisfaction regarding scars ( $p=0.001$ ). The 5-year disease-free survival and overall survival rates of TCND and RAND were not significantly different between the 2 groups. **결론:** Our study suggests RAND is safe for the treatment of selected early stage cN0 OSCC patients with a cosmetic benefit.

#### HNOP-51 09:40~09:50

### TRANSORAL ROBOTIC SURGERY IN PATIENTS WITH STAGE III/IV HYPOPHARYNGEAL SQUAMOUS CELL CARCINOMA: TREATMENT OUTCOME AND PROGNOSTIC FACTOR

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

YOUNG MIN PARK, DA HEE KIM, MIN SEOK KANG, JAE YOL LIM, YOON WOO KOH, SE-HEON KIM

**목적:** We aimed to reduce the morbidity related to treatment and to preserve organ function in patients with hypopharyngeal squamous cell carcinoma (HP-SCC) by applying a new surgical treatment protocol based on transoral robotic surgery (TORS). In this study, we analyzed the prognostic factors related to survival to confirm the validity and effectiveness of TORS in patients with advanced-stage HPSCC. **방법:** We retrospectively analyzed the data of 44 HPSCC patients who had undergone TORS-based therapy. **결과:** In univariate analysis, only the surgical marginal status showed a statistically significant correlation with the survival of the patients ( $p=0.009$ ). In multivariate analysis, surgical margin status was the only statistically significant prognostic factor related to survival. ( $p = 0.008$ ) Forty-one patients (93.2%) recovered speech function sufficiently to perform daily conversation without artificial aids. Forty-one patients (93.2%) were able to ingest food orally. **결론:** In the treatment

of advanced hypopharyngeal cancer, TORS-based therapy helped the surgeon obtain a clear surgical margin in patients with HPSCC, and it showed superior oncologic and functional outcomes compared to the existing treatment methods.

#### HNOP-52 09:50~10:00

### ENDOSCOPE-ASSISTED HAIRLINE APPROACH FOR RESECTING MAXILLOFACIAL MASSES

DANKOOK UNIVERSITY HOSPITAL

SEUNG HOON WOO, PHIL-SANG CHUNG, SANG JOON LEE

**목적:** The endoscope-assisted hairline approach is becoming a preferred technique in several surgical disciplines because of its advantage of good cosmetic outcomes. However, such operations are not yet standard for benign lesions in the maxillofacial area due to the anatomical complexity of this region. **방법:** This study describes an endoscope-assisted technique for resecting benign lesions in the maxillofacial area via a hairline approach. The clinical outcomes with this approach were compared to those obtained with the conventional transcutaneous approach. Benign maxillofacial lesions were excised via endoscope-assisted hairline approach in 27 patients and via transcutaneous approach in 28 patients. Clinical outcomes and complications related to the procedures were evaluated; the primary outcome was the efficacy of the procedure and the secondary outcome was cosmetic satisfaction. **결과:** There were no significant differences with respect to overall demographic characteristics between the groups, although the operation time was longer for the hairline approach ( $P=0.001$ ). Cosmetic satisfaction showed much better results for the hairline approach ( $P=0.001$ ). **결론:** Endoscope-assisted excision of benign maxillofacial lesions via the hairline approach is a feasible method with excellent cosmetic

results.

## HNOP 10

후두음성 I

10:20~11:20 • 세미나실2

Chairperson(s) : 진성민(성균관의대), 권택균(서울의대)

HNOP-53 10:20~10:30

### THE EFFECTS OF VOICE THERAPY FOLLOWING INJECTION LARYNGOPLASTY IN PATIENTS WITH UNILATERAL VOCAL FOLD PARALYSIS

DEPARTMENT OF OTORHINOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

GO-EUN JEONG, DAM HEE LEE, DAE SEONG AHN, SOON YUHL NAM, SANG-YOON KIM, JONG-LYEL ROH, SEUNG-HO CHOI, YOON-SE LEE

**목적:** 성문의 틈이 저명한 일측성 성대마비의 초기치료로 성대주입술을 우선 고려하는 경우가 많다. 성대주입술의 유용성은 많이 보고되어 있으나 음성의 경우 성문의 틈을 채워주더라도 비정상적인 점막 파동이나 탄성이 회복되지 않는 한 음성의 개선에는 한계를 보이는 경우가 많이 있다. 음성 치료는 성문부 점막의 파동을 향상시키는 효과가 있다. 이에 저자들은 성대주입술 후에 음성치료를 병합하여 시행할 때 음성의 개선 효과를 알아보려고 하였다. **방법:** 2017년 3월부터 2019년 6월까지 일측성성대마비를 주소로 내원한 환자들 중 초치료로서 성대주입술을 시행한 환자 267명 중 음성치료를 시행한 환자는 63명, 음성치료를 시행하지 않은 환자는 204명, 시술 후에 평가를 모두 시행한 환자는 30명이었다. 이들 중 음성치료를 시행한 집단(group A) 15명과 음성치료를 시행하지 않은 집단(group B) 15명으로 분류하여 연구를 진행하였다. 음성치료 횟수

는 총 3~10회기로 평균 5.3 회기였고, 치료기간은 평균 8.6개월 소요되었다. 각 집단의 초기평가는 성대주입술을 시행한 1개월 후에 평가하였으며, 음성치료집단은 치료 종결 후(평균 8개월)에, 음성치료를 시행하지 않은 집단은 평균 6개월 후에 평가하였다. 음성에 대한 청지각적 검사(GRBAS), 음향학적 검사(jitter, shimmer, NHR), 공기역학적 검사(MPT, MFR), voice range profile (VRP), voice handicap index (VHI)를 비교분석하였다. **결과:** 시술 후 검사의 각각 변수들에서는 집단간 유의한 차이가 없었다. Group A는 치료 후 청지각적 평가에서 G,R,B척도에서 유의하게 감소하는 결과를 나타내었고, 음향학적 평가에서 shimmer가 평균 6.1%에서 2.5%로 유의하게 감소하였다. Jitter와 NHR도 감소하였으나 의미 있는 차이는 보이지 않았다. 공기역학적 평가에서는 MPT가 유의성은 없었으나 평균10초에서 12초로 증가하는 경향을 보였다. VRP평가결과 음역 및 강도범위가 모두 유의하게 증가하였으며, VHI 총점평균 45점에서 11점, VHI는 3.8에서1.2로 유의하게 감소하였다. 음성치료를 시행하지 않은 집단은 청지각적 변수 및 음향학적 변수, 공기역학적 변수에서 호전되는 경향을 보였으나, 유의한 결과는 보이지 않았다. VHI 평가 시 총점평균이 35.6점에서 19.1점으로 감소, VHI는 4에서 3으로 감소하였다( $p<0.05$ ). A군에서 음성치료 후에, B군에 비해 음성이 지속적으로 향상되는 결과를 보였다. **결론:** 일측성 성대마비 환자의 초기치료로 성대주입술 후 지속적인 음성치료가 환자에게 음성개선과 환자만족도에 유용한 것으로 확인할 수 있었다. 따라서, 일측성 성대마비에 대해서 흡수성 보형물을 이용한 성대내 주입술을 시행하더라도 음성치료를 통해 음성이 개선된 상태를 유지할 수 있다.

HNOP-54 10:30~10:40

### CHANGE OF VOICE PARAMETERS AFTER THYROIDECTOMY: A PROSPECTIVE COHORT STUDY

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18월 (금)

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(OTOP)

비과 구연  
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(HNOP)

TPP

SURGERY, SEOUL NATIONAL UNIVERSITY HOSPITAL

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SUNGJUN HAN<sup>1</sup>, SUNG JOON PARK<sup>1</sup>, SEONG DONG  
KIM<sup>1</sup>, BO HAE KIM<sup>1</sup>, YOUNG JU JIN<sup>1</sup>, YOUNG JOO  
PARK<sup>2</sup>, KYU EUN LEE<sup>3</sup>, TACK-KYUN KWON<sup>1</sup>

**목적:** Thyroidectomy is a standard treatment for thyroid cancer. To clarify voice quality after thyroidectomy, we employed various measures in a time-course analysis of voice quality in patients who had undergone thyroidectomy resulting in normal morbidity of the vocal cords. **방법:** From Feb 2015 to Aug 2016, 211 patients who underwent thyroidectomy with or without central neck dissection were prospectively enrolled. All patients underwent prospective voice evaluations consisting of both subjective and objective assessments that took place preoperatively and then postoperatively at 2 weeks, 3 months, 6 months, and 12 months. **결과:** Values of the subjective assessment tool (visual analogue scale) decreased (worsened) during the early postoperative follow-up period and did not recover to the preoperative values at 12 months postoperatively. The maximal phonation time gradually decreased, whereas most objective parameters, including maximal vocal pitch (MVP), reached preoperative values at 3–6 months postoperatively. The initial decrease in MVP was significantly greater in patients who underwent total thyroidectomy, and their MVP recovery time was significantly faster than that of patients undergoing lobectomy ( $p=0.001$ ). Patients whose external branch of the superior laryngeal nerve was confirmed intact by electroidentification showed no difference in recovery speed compared with patients not undergoing electroidentification ( $p=0.102$ ), although the initial decrease in MVP was lower with electroidentification. The difference between MVP recovery times in patients undergoing total thyroidectomy treated with antiadhesion agents versus untreated patients was significant ( $p=0.041$ ). **결론:** Subjective assessment in voice quality after thyroidectomy and

maximal phonation time did not show recovery to preoperative values. Aggravation of MVP is associated with surgical extent, electroidentification, and use of antiadhesion agents.

HNOP-55 10:40~10:50

### REAL-TIME LIGHT-GUIDED VOCAL FOLD INJECTION (RL-VFI): IN VIVO FEASIBILITY STUDY IN A CANINE MODEL

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HEE YOUNG SON<sup>1</sup>, SANGHOON KIM<sup>2</sup>, HYOSEOK SEO<sup>2</sup>, DEOKSOO KIM<sup>2</sup>, WONJAE CHA<sup>2</sup>

**목적:** Vocal fold injection (VFI) is a minimally invasive technique for various vocal fold pathologies. Among various approaches, the cricothyroid (CT) membrane approach is a good option for office-based VFI. However, precise localization requires a high level of experience because the needle tip is invisible in small and complex laryngeal space. Recently, we had conceptualized a new technique that allows simultaneous injection under precise needle localization by light guidance: Real-time Light-guided VFI(RL-VFI). Previously, we developed the concept models for RL-VFI and validated its feasibility in ex-vivo canine model. Herein, we aimed to verify the feasibility of RL-VFI in in vivo canine model and tried to explore its clinical usefulness. **방법:** An adult male beagle was used for the experiment. A flexible naso-laryngoscopy system was used to examine vocal folds. A prototype device was developed and used for RL-VFI. The device comprised the light source(625 nanometers, red) and the injector connected with optic fiber. **결과:** The device was validated in various transcutaneous approaches including cricothyroid(CT) membrane,

trans-thyroid(TT) cartilage, and trans-hyoid(TH) membrane approaches. In CT approach, the light of the needle tip was scattered from CT membrane and paraglottic space before it came around VF mucosa or ligament. This guidance might be helpful to identify the needle route and to prevent inadvertent penetration. The lighted needle could be easily placed at intended points in the vocal fold with real-time visual-motor feedback. Also, the lighted needle could be easily found in paraglottic space and the petiole in TT and TH approaches. With CT approach, hyaluronic acid could be injected at the planned location lateral to vocal process under light guidance. Moreover, precise and simultaneous re-injection could be performed using the device. No adverse events of severe bleeding or thermal injury by the device were observed. **결론:** The device for RL-VFI is feasible and safe in an in vivo canine model, providing precise localization and visual-motor feedback. RL-VFI may be applied to trans-cutaneous approaches in human and is anticipated to improve the safety and precision of VFI.

#### HNOP-56 10:50~11:00

### ASSOCIATION BETWEEN DIETARY FACTOR AND INFLAMMATORY LARYNGEAL DISEASE IN THE NATIONWIDE COHORT STUDY: FOCUSED ON SELECTED NUTRIENTS AND DRINKS

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SOO YEON JUNG<sup>1</sup>, MIN-HO KIM<sup>2</sup>, EUN HEE HA<sup>3</sup>, SUNG MIN CHUNG<sup>1</sup>, HAN SU KIM<sup>1</sup>

**목적:** Laryngeal inflammation causes not only benign disease such as, laryngitis and granuloma but also malignancy. Several dietary factors including drink-

ing habits and nutrients are well known to control or modulate the inflammatory reaction in the body. In this study, we analyzed the association between dietary factors (drinks, tea, and nutrients) and inflammatory laryngeal disease (ILD) in Korean population. **방법:** Database of the Korean National Health and Nutrition Examination Surveys (KNHANES, 2008–2012) was analyzed. All raw data of total 21,116 participants who are over 19 years or older have undergone a laryngoscopy and filled up the dietary intake questionnaires were included. ILD was classified when a laryngitis and a laryngeal granuloma was noted in the laryngoscopy. The types of drinks and the number of drinks per week were analyzed in the habitual drinks. Single 24-h dietary recall was studied to evaluate the daily nutritional intake. **결과:** Of the 21,112 participants, 740 people had a laryngitis and 20 people had a laryngeal granuloma. ILD was associated with gender, age, body mass index, smoking, diabetes mellitus, coffee, wine, vitamin A, and retinol. Increased level of coffee, wine, and soju had significantly higher odds ratio with ILD (OR: 1.013, 1.030, 1.085,  $p < 0.05$ , respectively). However, participants with higher intake of vitamin A were associated with significantly lower odds of having ILD (OR: 0.989,  $p < 0.05$ ). **결론:** Increased dietary intake of vitamin A, carotene, and retinoid were associated with lower risk of ILD. Among the habitual drinks, increased consumption of coffee, wine, and soju was associated with a higher risk of laryngitis.

#### HNOP-57 11:00~11:10

### TREATMENT RESULTS OF VOCAL PROCESS GRANULOMA : INTUBATION VERSUS CONTACT GRANULOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, GACHON UNIVERSITY COLLEGE OF MEDICINE, GIL MEDICAL CENTER

JAE HWAN OH, BYUNG WOO LIM, DONG YOUNG KIM, JOO HYUN WOO

**목적:** 성대육아종에는 삼관성 육아종과 접촉성 육아종이 있으며 일반적으로 삼관성 육아종이 치료 효과가 좋은 것으로 알려져 있지만 이들의 치료 결과를 비교한 연구는 없다. 이에 저자들은 삼관성 육아종과 접촉성 육아종에 대한 임상양상을 분석하여 치료 결과에 대한 자료를 얻고자 하였다. **방법:** 성대육아종으로 진단되어 치료 받은 환자들을 대상으로 후향적 연구를 시행하였다. 한 명의 후두전문의에게 치료 받았고 치료에 대한 반응이 확인된 환자들을 대상으로 하였다. 삼관성 육아종환자 12명과 접촉성 육아종 환자 16명이 연구에 포함되었다. 진료기록을 통해 나이, 성별, 과거병력, 육아종의 크기, 형태, 역류관찰지수, 치료방법, 치료기간, 치료반응, 추적관찰기간 등을 조사하였다. **결과:** 삼관성 육아종은 접촉성 육아종에 비해 여성의 빈도가 높았고 크기가 큰것이 많았으며 모두 육아종성 형태였다. 역류관찰지수는 양군에서 유의한 차이가 없었다. 치료는 모든 환자에서 양성자펌프억제제와 스테로이드 흡입제를 이용한 일차치료가 시행되었으며 치료에 반응이 없는 경우 선택적으로 보톡스 주사가 시행되었다. 삼관성 육아종의 경우 통계적으로 유의하게 약물치료에 대한 반응이 좋았다( $p = 0.045$ ). **결론:** 삼관성 육아종은 접촉성 육아종에 비해 양성자펌프억제제와 스테로이드 흡입제에 대한 반응이 좋았다.

HNOP-58 11:10~11:20

#### THE EFFECT OF SEMI-OCCLUDED VOCAL TRACT EXERCISE IN UNILATERAL VOCAL FOLD PARALYSIS PRELIMINARY STUDY

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JI-SUNG KIM<sup>1</sup>, HYE-RIM CHAE<sup>2</sup>, SOENG-HEE CHOI<sup>2</sup>, DONG-WOOK LEE<sup>3</sup>, HAN-JIN JUNG<sup>1</sup>

**목적:** 음성치료에서 환자는 치료사의 모델링을 모방하

는 것에 어려움을 느낄 수 있으며, 동일한 치료기법을 사용하더라도 이에 대한 반응이 환자마다 다르게 나타날 수 있으므로 임상가는 다양한 치료기법에 대한 이해와 임상능력을 갖추어야 한다. 일측성 성대마비 환자들에게서 음성치료는 첫 6개월에 선택할 수 있는 주요한 치료방법 중 하나이며 거시적으로 후두와 성문상부의 과긴장 개선과 호흡능력 향상, 성문폐쇄 축진을 목표로 한다. 대표적인 음성치료법으로는 밀기접근법, hard glottal attack, half-swallowing, 호흡훈련, 이완훈련, 트릴, 공명음성치료, 엑센트기법, 흡기발성등이 있다. SOVTE는 성도 반폐쇄로 인한 성도의 모양 변화에서 비롯되는 기류와 성대진동의 변화를 음성치료에 적용한 것이다. SOVTE 시 후두는 하강하고 인두가 확장되며 성문 상부 수축과 같은 간섭 없이 성대가 진동하기 때문에 과기능적 음성장애에 뿐만 아니라 과소기능적 음성장애에 치료에 효과적인 방법으로 보고되어져 왔다. 이에 따라 본 연구는 예비연구로서 갑상선술 이후 발생한 일측성 성대마비 환자를 대상으로 SOVTE와 손가락 조작법을 이용한 음성치료의 효과를 알아보고자 한다. **방법:** 본 연구의 대상자는 갑상선 절제술을 받은 여성 환자 3명이며 연령은 59.94세이다. 대상자들은 갑상선술 후 2주 이비인후과 외래에서 일측성 성대마비로 진단받았으며, 마비위치는 2명은 정중위, 1명은 부정중위였다. 음성치료는 SOVTE와 손가락 조작법을 사용하였으며 음성평가 이후 즉시 실시되었고, 치료의 효과를 확인하기 위해 치료 전과 후 음향학적 분석을 실시하였다. **결과:** ADVS를 이용한 캡스트럼 분석에서 CPP F0가 8.408에서 12.71로, L/H ratio가 24.745에서 25.719로 증가하였다. 또한, MDVP를 이용한 분석에서는 Jitter가 3.502에서 0.818로, Shimmer이 11.41에서 6.712로, NHR은 0.229에서 0.164로 감소하였다. F0는 173.7에서 198.73으로 증가하였다. **결론:** 손가락 조작법과 SOVTE는 일측성 성대마비의 음성치료에 즉각적인 효과를 나타내었다. SOVTE는 실시간 바이오 피드백이 가능하다고 적용 방법이 간단하기 있기 때문에 환자교육 통해 Self practice로 수행할 수 있다는 장점이 있다. 본 연구는 예비연구로 대상자의 수자 제한적이고 음성 측정 역시 음향학적 분석만을 실시하였다. 추후 연구에서는 다방면의 음성평가와 시간경과에 따른 연구가 필요하겠다.



**HNOP 11**

구강/인두/타액선 I

10:20~11:20 • 세미나실4

Chairperson(s) : 권순영(고려의대), 정만기(성균관의대)

**HNOP-59 10:20~10:30****APPLICATION OF PLATELET GEL IN THE PREVENTION AND TREATMENT OF AGING-INDUCED HYPOSALIVATION IN MOUSE**

DEPARTMENT OF OTORHINOLARYNGOLOGY, INHA UNIVERSITY SCHOOL OF MEDICINE

JEONG-SEOK CHOI, JEONG MI KIM, JI WON KIM, YOUNG-MO KIM

**목적:** Platelet gel (PG) is defined as autologous platelet derivatives with a platelet concentration higher than baseline and is widely used in different areas of regenerative medicine in order to enhance wound healing processes. Here, we examined whether the local injection of conditioned PG could protect aging induced salivary gland (SG) dysfunction, and explored the mechanisms responsible for the protective effects of PG on aging induced SG hypofunction. **방법:** The platelets were separated from the blood of male SD rats ( $220 \pm 20$  g) and activated with A23187 (10uM) or collagen (2 ug/ml) to obtain PG (aPG and cPG). The amounts of total protein and TGF- $\beta$ 1 in platelet gel were determined by ELISA. Mice were divided into 4 groups: 3 months old, 22 months old, 22 months old treated with aPG and 22 months old treated with cPG. The SG function and structural tissue remodeling by the PG were investigated. Irradiation induced cellular senescence and the proliferation of human primary salivary gland epithelial cells (hSGECs) were checked by beta-galactosidase ( $\beta$ -gal) and CCK8, respectively.

The superoxide dismutase (SOD) and amylase activity were checked by ELISA. Histologic examinations and Terminal Deoxynucleotidyl Transferase Biotin-dUDP nick and labeling (TUNEL) assay of animal tissue and cell block were performed. **결과:** The local injection of PG resulted in improved salivation capacity relative to the non-treated 22 month old mice. The microscopic structural integrity of SG was maintained and senescent ( $\beta$ -gal) and inflammatory (CD4) cells were significantly inhibited with PG treatment in aged mice. The PG strongly induced proliferation of SGECs and led to a significant decrease cellular senescence, in vitro. Moreover, the expressions of pP21, 8-OHdG and apoptotic cells were markedly decreased and activities of amylase and SOD were increased in PG treated SGECs compared to the untreated SGECs. **결론:** Our result show that PG could be used to protective agent against aging induced SG dysfunction.

**HNOP-60 10:30~10:40****PATTERNS OF LYMPH NODE METASTASIS AND RECURRENCE IN PATIENTS WITH HPV-ASSOCIATED OROPHARYNGEAL CANCER WHO UNDERWENT INITIAL SURGERY**

DEPARTMENT OF OTOLARYNGOLOGY, AJOU UNIVERSITY SCHOOL OF MEDICINE

JEON YEOB JANG, DONG YOUNG KIM, YOO SEOB SHIN, CHUL-HO KIM

**목적:** This study aimed to address the unique patterns of cervical lymph node (LM) metastasis and recurrence in HPV-associated oropharyngeal cancer (OPC). **방법:** We retrospectively analyzed medical records of 70 consecutive patients with oropharyngeal cancer who underwent initial surgery-based treatment. Status of HPV infection was determined by either p16 immunohistochemistry or HPV in situ hybridization. Pathologic reports were evaluated for

identifying LN-metastatic characteristics including LN number, location, size, extracapsular spread. Patterns of local, regional, distant recurrences were also reviewed. **결과:** Overall, 56 patients (80%) were identified as HPV-associated OPC. The recurrence-free survival (RFS) rates were significantly better in patients with HPV-associated oropharyngeal cancers compared with those having HPV-negative cancers (2 year RFS 95.4% in HPV-associated OPC, 65.3% in HPV-negative OPC,  $p<0.001$ ). In patients with HPV-associated OPC, the number of metastatic LNs were 1-30 (median 2). The frequencies of at least one metastatic LNs for neck levels 1, 2, 3, 4, 5 were 3.6% (2/56), 66.1% (37/56), 33.9% (19/56), 12.5% (7/56), 1.8% (1/55), respectively. Retropharyngeal LN metastasis were found in 5 patients (8.9%) and are associated with previous radiation or neck dissection or infection. Among 2 patients with recurrences in HPV-associated OPC, one patient was found to have regional failure and the other was found to have distant failure, and both were found to have retropharyngeal LN metastasis at the time of initial surgery. **결론:** HPV-associated OPC showed excellent disease-free survival rates (over 90% in 2 year RFS). Metastatic LNs were frequently found in level 2, 3 area in the surgically resected specimen while the retropharyngeal LN metastases were found in about 10% of the patients with possible increases of the risk for recurrence.

#### HNOP-61 10:40~10:50

### THE COMPARISON OF GENOMIC AND CLINICAL FEATURES ACCORDING TO SMOKING IN HUMAN PAPILLOMA VIRUS RELATED OROPHARYNGEAL CARCINOMA

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KYUNG HEE UNIVERSITY, DEPARTMENT OF BIOMEDICAL SCIENCE AND TECHNOLOGY, KYUNG HEE

UNIVERSITY GRADUATE SCHOOL<sup>2</sup>, DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHUNG-ANG UNIVERSITY HOSPITAL<sup>4</sup>

SOO-IL KIM<sup>1</sup>, JOO-GYEONG NO<sup>2</sup>, YOUNG-CHAN LEE, YOUNG-GYU EUN<sup>1</sup>, SE-YOUNG LEE<sup>41</sup>

**목적:** Human papilloma virus(HPV) (+) oropharyngeal head and neck squamous cell carcinoma (OPHNSCC) is known to have different etiology and prognosis compared to HPV (-) OPHNSCC. There were many patients who have smoking history in HPV(+) OPHNSCC. These patients might have another genomic and clinical features from HPV(+) smoking (-) OPHNSCC. We sought to investigate the genomic and clinical feature of patients with HPV (+) and smoking (+) OPHNSCC. **방법:** We found the OPHNSCC cohort from The Cancer Genome Atlas (TCGA) and GEO database. The survival rates were compared between HPV(+) smoking (+) OPHNSCC and HPV(+) smoking (-) OPHNSCC from two OPHNSCC cohort. The mRNA expression from RNA sequencing or microarray in two cohorts was compared between two group. We performed the pathway analysis with differentially expressed genes. **결과:** HPV(+) OPHNSCC patients had better prognosis than HPV(-) patients. HPV(+) smoking (+) HPV OPHNSCC patients had worse prognosis than HPV(+) smoking(-) OPHNSCC patients but did not have statistical significance. We found the differentially expressed gene signature and specific gene pathway of HPV(+) smoking(+) OPHNSCC. **결론:** These results suggest that HPV(+) smoking(+) OPHNSCC might have different pathogenesis from HPV(+) smoking (-) OPHNS

#### HNOP-62 10:50~11:00

### EFFECT OF EXTRANODAL EXTENSION(ENE) IN AJCC 8H EDITION FOR HPV NEGATIVE OROPHA-

## RYNGEAL CANCER: THE PERSPECTIVE FROM A GENOMIC ANALYSIS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KANGNAM SACRED HEART HOSPITAL, HALLYM UNIVERSITY COLLEGE OF MEDICINE

BUM SANG LEE, JONG KYU LEE, SOO KYUNG JANG, KANG HYUN SEO, JIN HWAN KIM, DONG JIN LEE

**목적:** The American Joint Commission on Cancer (AJCC) recently suggested AJCC 8th edition outlining its respective staging system for HPV positive and HPV negative oropharyngeal cancers. In contrast to many reports for HPV positive cancer, there are few validation study of this staging system for HPV negative oropharyngeal cancer. **방법:** Statistical analysis and genomic analysis were done using gene expression data and clinical data of HPV negative oropharyngeal cancers in The Cancer Genome Atlas (TCGA) cancer browser (<https://genome-cancer.ucsc.edu>). Among 79 cases of oropharyngeal cancers, 46 cases were HPV negative. Total 10 cases showed down-staging in AJCC 8th edition when compared to AJCC 7th. We compared overall survival (OS) according to clinical stage using AJCC 7th and AJCC 8th respectively. Also, using differently expressed genes(DEG) between extranodal extension (ENE) positive group and negative group, we tried to find altered canonical pathways which could explain the effectiveness of new staging system. **결과:** When we compared OS using Kaplan Meier survival curve, both AJCC 7th and AJCC 8th staging systems showed statistically significant survival difference according to each stage. However, survival analysis showed improved hazard discrimination in the AJCC 8th edition staging system ( $p=0.01$  in AJCC 7th vs  $p=0.004$  in AJCC 8th). Presence of ENE confers a negative effect on overall survival ( $p=0.009$ , log-rank test). Several pathways associated with tumor aggressiveness were upregulated in ENE positive HPV negative oropharyngeal cancer. **결론:** Using TCGA data for validation, the AJCC 8th edition showed

much improved hazard discrimination for HPV negative oropharyngeal cancer, with a lot of cases reclassified as stage IVB due to ENE positive. Presence of ETE demonstrated a statistically significant negative effect on overall survival. Tumor aggressiveness related pathways were upregulated in ENE positive HPV negative oropharyngeal cancer.

**HNOP-63 11:00~11:10**

## SOFT TISSUE NECROSIS IN TONSIL CANCER TREATED WITH POSTOPERATIVE RADIATION THERAPY

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

GEUN-JEON KIM, DONG-HYUN LEE, JUN-OOK PARK, GWANG-JAE JO, MIN-SIK KIM

**목적:** A subset of patients with squamous cell carcinoma in tonsil managed with transoral surgery and postoperative radiation therapy (PORT) developed soft tissue necrosis (STN) in the surgical bed months after completion of PORT. We investigated the frequency and risk factors and evaluated the role of local flap by comparing the group with and without the reconstruction of the tonsil bed with local flap after surgery. **방법:** This retrospective analysis included 60 patients treated with transoral surgery (30 TORS patients included) and PORT between 2000 and 2016, with >30months of follow-up. The 60 patients were divided into two groups: tonsil bed covered with local flap (6 patients) and non-covered group (53 patients). STN is a clinical diagnosis defined as persistent non-healing ulceration of the surgical bed >6 weeks after completion of PORT, after recovery from the acute effects of adjuvant RT. **결과:** A total of 14 of 59 patients (23.7%) had a diagnosis of STN. STN did not appear in the group covered with local flap. Thirty-one pa-

18월 (금)

본과 및 유관학  
회 포스터 발표

Education  
Program

이과 구역  
(OTOP)

비과 구역  
(RHOP)

두경부 구역  
(HNOP)

TPP

tients (51.7%) received concurrent chemotherapy. The occurrence of STN was not statistically significant depending on the chemotherapy. Median radiation dose was 6092cGy and there was a positive correlation with the occurrence of STN( $p=0.042$ ). In 16 patients with STN, the higher the prevalence of STN ( $p=0.005$ ). The involvement of cervical level II lymph node was positive in 50 out of 60 patients, of which 17 had positive extranodal extension (ENE). ENE positive correlated significantly with STN( $p=0.008$ ). STN did not occur in 6 patients who were covered with local flap (superior constrictor muscle rotation flap (SCARF) and buccinator flap). **결론:** We believe that through appropriate patient selection, careful attention to radiation planning, and covered with flap in resection bed, the rates of STN can be significantly reduced, with subsequent therapeutic gains for our patients.

#### HNOP-64 11:10~11:20

### PROPOSED STAGING SYSTEM FOR SURVIVAL OF HEAD AND NECK SOFT TISSUE SARCOMAS

<sup>1</sup>DEPARTMENTS OF OTOLARYNGOLOGY, <sup>2</sup>PATHOLOGY, <sup>3</sup>RADIATION ONCOLOGY, AND <sup>4</sup>INTERNAL MEDICINE (ONCOLOGY), ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

JA YOON KU<sup>1</sup>, JONG-LYEL ROH<sup>1</sup>, KYUNG-JA CHO<sup>2</sup>, SANG-WOOK LEE<sup>3</sup>, SUNG-BAE KIM<sup>4</sup>, SEUNG-HO CHOI<sup>1</sup>, SOON YUHL NAM<sup>1</sup>, SANG YOON KIM<sup>1</sup>

**목적:** Soft tissue sarcomas of the head and neck (HNSTS) show various histological types and different clinical behaviour. Recent edition (8th) of American Joint Committee on Cancer (AJCC) proposed a staging system for HNSTS apart from other body soft tissue sarcomas, which needs to be further defined. Therefore, we evaluated the prognostic factors for survival of HNSTS patients so as to compare between

our proposed and AJCC staging systems. **방법:** This study involved 179 consecutive HNSTS patients who underwent definitive treatments of primary surgery or radiotherapy. Cox proportional-hazard regression analyses were used to identify factors associated with overall survival (OS), disease-specific survival (DSS), and disease-free survival (DFS). Our proposed N classification was compared with AJCC 7th and 8th edition N classifications using the C-index. **결과:** During follow-up of median 75 months, the 5-year OS, DSS, and DFS were 75%, 76%, and 79%. Univariate analyses showed that age (>60 years), tumor size (>4 cm), histological grade, nodal metastasis, and overall stage were significant prognostic factors for OS, DSS, and DFS (all  $P < 0.05$ ). Multivariate analyses showed that age, histological grade, and nodal metastasis remained the independent variables for OS, DSS, and DFS (all  $P < 0.05$ ). Recent 8th AJCC T staging have improved the C-index compared with the previous 7th T staging. Further, the C-index of our proposed staging system showed improvement in OS prediction (0.788) compared with the AJCC 7th (0.743). **결론:** Recent and our proposed staging systems may provide the improved risk stratification for the survival of HNSTS patients after definitive treatments.

## HNOP 12

후두음성 II

13:10~14:10 • 세미나실2

Chairperson(s) : 박영학(가톨릭의대), 임재열(연세의대)

#### HNOP-65 13:10~13:20

### DEVELOPMENT AND VALIDITY OF THYROIDECTOMY-RELATED VOICE QUESTIONNAIRE(TVQ)

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, THE CATHOLIC UNIVERSITY COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF THYROID & ENDOCRINE SURGERY, THE CATHOLIC UNIVERSITY COLLEGE OF MEDICINE

YEON-SHIN HWANG<sup>1</sup>, MI-RAN SHIM<sup>1</sup>, GEUN-JUN KIM<sup>1</sup>, DONG-HYUN LEE<sup>1</sup>, INN-CHUL NAM<sup>1</sup>, JUN-OOK PARK<sup>1</sup>, JA-SEONG BAE<sup>2</sup>, DONG-IL SUN<sup>1</sup>

**목적:** Voice change and throat & neck discomfort are common symptoms after thyroidectomy. But no common questionnaire has been developed and there is no tool to identify the difficulties or suffering of patients after thyroidectomy. The purpose of this study was to evaluate the reliability and validity of thyroidectomy related voice questionnaire(TVQ) after thyroidectomy. **방법:** In the pilot study, 40 items of TVQ were defined by dividing into 20 items related 'voice change' category and 20 items related 'throat & neck discomfort' category through item generation. Through the reduction process(content validity, face validity, and internal consistency), 20 items were reduced and then 20 items of TVQ(10 items related 'voice change' category and 10 related 'throat & neck discomfort' category) were left. Then, we evaluated the reliability and validity of these 20 items through item discrimination, test-retest reliability, concurrent validity, and external validity. **결과:** Item discrimination showed a significant correlation between TVQ total score and subcategory total score. Test-retest reliability showed a significant correlation between TVQ total score at 2 weeks and 4 weeks postoperatively. Through concurrent validity, we found that TVQ has a high correlation with other voice questionnaires(VHI, RSI, and VTD). External validity revealed that TVQ is a suitable questionnaire for patients after thyroidectomy. **결론:** This validity and reliability test revealed that TVQ is a suitable questionnaire to assess the subjective feelings of patients with voice change and throat & neck discomfort after thyroidectomy.

HNOP-66 13:20~13:30

## LONG-TERM DOSE AND INTERVAL STABILITY OF UNILATERAL VERSUS BILATERAL BOTULINUM TOXIN INJECTION IN ADDUCTOR SPASMODIC DYSPHONIA

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

SEUNG JIN LEE, MIN SEOK KANG, HONG-SHIK CHOI, JAE-YOL LIM

**목적:** It is still under debate whether dosing trend and interval stability of Botulinum toxin type A (BoN-TA) injection in adductor spasmodic dysphonia differ between alternating unilateral versus bilateral BoN-TA injection. The purpose of the current study was to compare the long-term dose change and average treatment interval between the two methods of laterality. In addition, we sought to investigate the difference in the % of patients with relatively stable dose and interval between the laterality groups. **방법:** A total of 137 patients (105 with unilateral injection vs. 32 with bilateral injection) with  $\geq 5$  injections were included in the study after reviewing the clinical records. The mean dose change, dose change per injection, and dose adjustment ratio (number of increasing dosing/total number of BoNTA injections) were compared between alternating unilateral and bilateral injection groups. The % of dose- (no dose increase) and interval ( $\geq 100$ d) stable patients was compared between two groups. The average follow-up period was  $69.36 \pm 48.19$  months. **결과:** Results showed that mean dose change in units and dose change per injection for both uni- ( $-0.010 \pm 0.048$  and  $-0.001$  per injection, respectively) and bilateral injection ( $-0.042 \pm 0.142$  and  $-0.003$  per injection, respectively) did not differ between groups ( $p = .215$  and  $p = .760$ , respectively). Dose adjustment ratio did not show difference between groups( $p > .05$ ), although longer average treatment interval was found in bilateral injection

group ( $p < .001$ ). The % of dose and interval stable patients did not differ between the groups ( $p=1.000$  and  $.087$ , respectively). **결론:** Both alternating uni- and bilateral injection methods showed tendency of stable or decreasing dose and treatment intervals during follow-up. Although the detailed practice of BoNTA injection should be individualized for patients, alternating unilateral injection could be considered as a comparable option in case bilateral injection induce substantial discomfort for patients.

#### HNOP-67 13:30~13:40

### AN ACOUSTIC STUDY ON VOICE CHANGE OF CHILDREN WITH VOICE DISORDER AFTER TONSILLECTOMY AND ADENOIDECTOMY

DEPARTMENT OF OTOLARYNGOLOGY-HEAD & NECK SURGERY, HALLYM UNIVERSITY MEDICAL CENTER, HWASEONG, KOREA

BO-RAM KEUM, GEUN HEE KIM, HEEJIN KIM, IL-SEOK PARK

**목적:** 편도 및 아데노이드 비대 아동이 구호흡 및 잦은 상기도감염 등의 요인으로 인해 음성문제 발생에 취약성을 가질 수 있음에도 불구하고 상기집단 아동의 음성문제 및 수술 후의 변화에 초점을 맞춘 연구는 매우 제한적이다. 따라서 편도 및 아데노이드 절제술 시행 환자 중 음성문제를 가진 아동을 대상으로 하여 수술 전후 음향학적 특성과 음성문제 인식에 대한 변화를 비교하고자 하였다. **방법:** 편도 및 아데노이드 절제술을 받기 위해 내원한 환자 중 음질에 대한 청지각적 척도 GRBAS 1.5이상으로 음성장애가 의심되는 환자 77명(만 3세~12세)을 대상으로 수술 전, 수술 후 1개월(51명), 3개월(19명)의 음향학적 특성과 음성장애인식도를 추적관찰 하였다. 음향학적 분석은 MDVP 변수(Fo, jitter%, Shimmer%, NHR, SPI)로, 음성장애인식에 대한 평가로 한국어판 소아음성장애지수(Korean-Pediatric Voice Handicap Index; K-PVHI) 및 중증도 척도, 음성사용량에 대한 설문을 작성하도록 하였다. 각 검사

후 보호자와 소아를 대상으로 5분 내외의 음성위생교육 및 상담을 실시하였다. 각각의 결과에 대해, 대응표본 t검정, 반복측정 분산분석을 실시하였다. **결과:** 모든 대상자는 수술 후 구호흡이 없어지거나 감소하였다고 보고하였다. 수술 후 1개월 추적검사에서 음향학적 지표 중 Fo는 255.79Hz에서 276.39Hz로 통계적으로 유의하게 증가하였고( $p<.05$ ) jitter%는 2.73에서 1.28로, shimmer% 6.94에서 4.42로, SPI는 11.78에서 5.9로 모두 통계적으로 유의한 수준으로 감소되었다( $p<.01$ ). 소아음성장애지수는 24.11에서 15.49로 중증도 척도는 5.78에서 3.9 수준으로 수술 전 후 통계적으로 유의하게 감소하는 양상 나타내었으나( $p<.01$ ), 아동의 실제 발화량 설문점수는 5.8에서 5.72로 수술 전후 통계적으로 유의한 차이가 나타나지 않아 음성사용량과 상관없이 음성지표가 좋아진 것을 확인할 수 있었다. 또한 수술 후 3개월 추적검사에서 발화량을 제외한 모든 음향학적 지표 및 주관적 인식도에 유의한 차이( $p<.01$ )를 보여 수술 후 1개월에 호전된 양상이 유지되고 있음을 나타내었다. **결론:** 편도 및 아데노이드 비대 환자 중 음성문제를 동반한 경우 수술 후 구호흡의 감소 및 음향학적 특성 및 주관적 인식도에 호전을 보였다. 향후 상기집단 환자의 음성문제에 주목하고 음성위생준수에 대한 정보를 제공하는 것이 효과적일 것으로 사료된다.

#### HNOP-68 13:40~13:50

### THE DIAGNOSTIC VALUE OF BASELINE IMPEDANCE IN 24-HOUR MULTICHANNEL INTRALUMINAL IMPEDANCE-PH MONITORING IN PATIENTS WITH LARYNGOPHARYNGEAL REFLUX

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KYUNG HEE UNIVERSITY

JEONG-GANG DOO, YOUNG CHAN LEE, YOUNG-GYU EUN

**목적:** The diagnosis of laryngopharyngeal reflux(LPR) is currently based on a combination of the patient history symptom and the results of 24-hour multichannel intraluminal impedance-pH monitoring(24hrMII-pH

monitoring)results. Baseline impedance(BI) showed the significant value in patients with gastroesophageal reflux disease. However, there was limited study about the role of BI pharyngeal level in LPR patients. The aim of this study was to compare the esophageal and pharyngeal BI between LPR patients and control group. **방법:** 24hrMII-pH monitoring was performed in 36(55.2yrs, 22-72yrs, M:F=16:20)patients with LPR as well as 21(43.9yrs,25-68yrs, M:F=4:17) controls. 21 controls defined as not having LPR symptoms and with RFS(reflux finding scores)<7. 24hrMII-pH monitoring parameters and BI were analyzed from pharyngeal sensors, proximal esophageal sensors and distal esophageal sensors. These BI were obtained the average at three time points(around 1:00, 2:00 and 3:00 am)during sleeping. In particular, we selected 10min around each time point avoiding swallows, refluxes and pH drops. We also calculated the ratios of the proximal to distal BI and the pharyngeal to distal BI. **결과:** There was no significant difference in pharyngeal BI between LPR patients and controls( $2179 \pm 997$  vs  $1805 \pm 732$ , p-value=0.14). LPR patients had significantly lower distal BI than controls( $2129 \pm 888$  vs  $2760 \pm 724$ , p-value=0.021). Additionally LPR patients had significantly lower proximal BI than controls( $2162 \pm 670$  vs  $2564 \pm 780$ , p-value=0.045). Although there was no statistical significance, the reflux number and acid exposure time in distal esophagus were lower in LPR patients compared to controls. **결론:** The result of the pharyngeal BI did not differ between LPR patients and controls. LPR patients had lower distal and proximal baseline impedance levels than controls. The distal and proximal BI was the same as other studies. Above results may be due to the tendency of the differences in reflux time and numbers of distal level.

HNOP-69 13:50~14:00

### STUDY FOR CORRELATION BETWEEN OBJECTIVE AND SUBJECTIVE VOICE PARAMETERS IN DYSPHONIA PATIENT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, GACHON UNIVERSITY, COLLEGE OF MEDICINE, GIL MEDICAL CENTER DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD & NECK SURGERY, GACHON UNIVERSITY, COLLEGE OF MEDICINE, GIL MEDICAL CENTER

OH JAE HWAN, DONG YOUNG KIM, JOO HYUN WOO

**목적:** 음성검사의 각각의 검사가 독립적으로 의미를 가지지만 검사들 간에 연관성이 있다면 좀더 임상적인 의미를 둘 수 있을 것으로 판단된다. 이에 저자들은 발성장애 환자들에서 주관적검사와 객관적검사 사이의 연관성을 분석하여 질환 별로 의미 있는 평가요소들을 알아보려고 하였다. **방법:** 2017년 5월부터 2018년 5월 까지 발성장애로 내원한 환자들을 GRBAS, 음성장애지수, Jitter, Shimmer, 잡음대조화음비(NHR), 캡스트럼 모음발성(CPP-/a/)과 문장발성(CPP-s), 최대발성시간(MPT), 평균호기율(MFR), 성문하압력(SP)을 분석하였다. Pearson correlation test 를 이용하여 각 항목들간의 연관성을 측정하였다. **결과:** 성대결절은 G, R, B 에서 CPP-/a/, CPP-s, Jitter, Shimmer, NHR 등과, 성대용종은 G, R, S에서 Jitter, Shimmer와, 성대구종은 G와 B에서 CPP-/a/, CPP-s, Jitter, Shimmer, MPT, MFR, SP 등과 연관성을 보였다. 일측성대마비는 G, B가 CPP-/a/, CPP-s, MPT와 높은 연관성을 보였다. **결론:** G, B가 성대결절, 성대구, 성대마비에서 객관적검사와 연관성이 있는 것으로 나타났다. Jitter, Shimmer는 모든 질환에서, CPP와 MPT는 B가 두드러진 질환에서 연관성을 보였다.

HNOP-70 14:00~14:10

### COMPARISON OF OUTCOMES BETWEEN ANTI-

18월 (금)

본과 및 유관학  
회 포스터Education  
Program이과 구연  
(OTOP)비과 구연  
(RHOP)두경부 구연  
(HNOP)

TPP

## BIOTICS AND NON-ANTIBIOTICS GROUPS AFTER LMS IN VOCAL FOLD POLYP

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SEONG-WOOK CHOI<sup>1</sup>, IN-HO BAE<sup>1</sup>, DA-HEE PARK<sup>1</sup>, HYUN-GEUN KWON<sup>1</sup>, JI-SEUNG MOON<sup>1</sup>, BYUNG-JOO LEE<sup>2</sup>, JIN-COON LEE<sup>1</sup>, EUI-SUK SUNG<sup>1</sup>

**목적:** Most vocal cord polyps undergo laryngomicrosurgery(LMS) because vocal fold polyps often improve with surgery. Larynx is a clean contaminated wound. Therefore, the purpose of this study was to determine whether there was a difference in postoperative complications and voice outcome between antibiotics and non-antibiotics groups after LMS in vocal fold polyp. **방법:** Of the 88 patients who underwent LMS with vocal polyp from June 2018 to May 2019, 48 patients were treated with PO antibiotics and 40 were not. Postoperative complications such as infection and bleeding were compared. Preoperative and postoperative acoustic analysis and maximal phonation time(MPT) of each group were compared and postoperative voice analysis was compared between two groups. **결과:** Jitter was 3.458, 3.261 and 3.261, 1.125, respectively. The preoperative and postoperative shimmer of the non-antibiotic group was 5.180 and 3.269, respectively, and that of the antibiotic group was 5.481 and 3.490, respectively. The preoperative and postoperative NHR of the non-antibiotic group was .182 and .106, respectively. The antimicrobial use group was .175 and .110, respectively. The preoperative and postoperative MPTs of the non-antibiotic group were 8.8 and 12.8, respectively, and that of the antibiotic group was 8.0 and 13.1, respectively. Statistical analysis of the pre and postoperative results revealed jitter ( $t = 24.608$ ,  $p < .001$ ), shimmer ( $t = 17.547$ ,  $p < .001$ ), NHR ( $t = 30.249$ ,  $p < .001$ ), MPT ( $t = -14.013$ ,  $p$

$< .001$ ) all parameters showed a significant improvement, but there was no difference between the groups according to the use of antibiotics and the postoperative jitter ( $F = .596$ ,  $p = .442$ ), shimmer ( $F = 2.526$ ,  $p = .116$ ), NHR ( $F = 2.969$ ,  $p = .088$ ), MPT ( $F = .780$ ,  $p = .380$ ) showed no significant difference. **결론:** Simple larynx surgery such as vocal fold polyps does not require postoperative antibiotics since the use of antibiotics after surgery does not affect complications and voice outcomes.

## HNOP 13

후두/하인두

14:10~15:10 • 세미나실2

Chairperson(s) : 권기환(한림의대), 이진춘(부산의대)

## HNOP-71 14:10~14:20

## EFFICACY AND MORBIDITY OF POSTOPERATIVE RADIOTHERAPY FOR CARCINOMA IN SITU OF VOCAL FOLDS AFTER LASER STRIPPING SURGERY

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA, <sup>3</sup>HANA ENT HOSPITAL, SEOUL, REPUBLIC OF KOREA

MIN SEOK KANG<sup>1</sup>, SEUNG JIN LEE<sup>2</sup>, HONG-SHIK CHOI<sup>3</sup>, JAE-YOL LIM<sup>1,2</sup>

**목적:** Laser stripping of carcinoma in situ (CIS) of vocal folds is performed as one of treatment modalities. However, the role of radiotherapy after laser stripping remains to be determined although CIS of vocal folds has a high potential risk of recurrence and progression



to invasive glottic cancer. This study was conducted to investigate clinical outcomes of laser stripping of CIS of vocal folds, identify risk factors of recurrence, and determine the role of postoperative radiotherapy. **방법:** 30 patients with CIS of vocal folds treated by CO<sub>2</sub> or angiolytic laser stripping with or without postoperative radiotherapy were identified retrospectively. The mean follow-up duration after initial treatment was  $53.6 \pm 36.6$  months. **결과:** CO<sub>2</sub> laser stripping was conducted in 16 patients and angiolytic laser stripping in 14 patients. 23 patients received surgery alone with serial stripping when recurrent, and 7 patients received postoperative adjuvant radiotherapy after initial stripping. In serial stripping group, 16 patients (69.6%) had local recurrence, of whom 4 patients (17.4%) showed progression to invasive glottic cancer. On the other hand, no patient had local recurrence or disease progression in postoperative radiotherapy group. Recurrence-free rate at 5 years was 16.8 % in serial stripping group and 100 % in postoperative radiotherapy group. Univariate and multivariate analysis to predict risk factors of recurrence showed that complete resection was important prognostic factors in univariate analysis, but no significant factor in multivariate analysis. Voice parameters did not differ between the two groups. **결론:** Serial laser stripping of CIS of vocal folds showed the higher risk of local recurrence and disease progression. Postoperative radiotherapy should be considered when the vocal fold leukoplakia is diagnosed as CIS after laser stripping because it decreases the recurrence without significant voice deterioration after radiotherapy.

HNOP-72 14:20~14:30

#### PERCUTANEOUS ULTRASOUND-GUIDED FINE-NEEDLE ASPIRATION CYTOLOGY/CORE-NEEDLE BIOPSY FOR UPPER AERODIGESTIVE TRACT MASS LESIONS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNGPOOK NATIONAL UNIVERSITY

DONGBIN AHN, GIL JOON LEE, JIN HO SOHN

**목적:** Biopsy via suspension laryngoscopic examination under general anesthesia is the standard diagnostic procedure in patients with suspicious upper aerodigestive tract (UADT) masses, particularly for laryngo-hypopharyngeal malignancies. We evaluated feasibility and diagnostic performance of percutaneous ultrasound (US)-guided fine-needle aspiration cytology (FNAC)/core-needle biopsy (CNB) (US-FNAC/CNB) for suspicious UADT mass lesions. **방법:** This study was designed as prospective case series. Between January 2018 and July 2019, We prospectively enrolled patients 23 patients with suspicious UADT mass lesions. Patients with small superficial lesion with possible cT1 disease were excluded. **결과:** From a total of 23 patients, the lesion was identifiable on US in 20 patients. Among these patients, percutaneous US-FNAC/CNB was successfully performed in 19 patients. The results of US-FNAC/CNB were squamous cell carcinoma in 18 patients and atypical spindle cell lesion in 1 patient. In 1 patient with inconclusive result, additional suspension laryngoscopic examination with biopsy was performed under general anesthesia and confirmed as squamous cell carcinoma of the hypopharynx. **결론:** Percutaneous US-FNAC/CNB might be a good alternative to suspension laryngoscopic biopsy under general anesthesia in well-selected patients with suspicious UADT mass lesions.

HNOP-73 14:30~14:40

#### ONCOLOGIC AND FUNCTIONAL OUTCOMES OF HYPOPHARYNX CANCER PATIENTS UNDERWENT TRANSORAL RESECTION

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD

18월 (금)

본과 및 유관학  
회 포스터 발표Education  
Program이과 구역  
(OTOP)비과 구역  
(RHOP)두경부 구역  
(HNOP)

TPP

AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE, SEOUL, REPUBLIC OF KOREA

SEUNG HWAN BANG, JAE WOO JOO, KYUNG HO OH, JAE GU CHO, SEUNG KUK BAEK, SOON YOUNG KWON, KWANG YOON JUNG, JEONG SOO WOO

**목적:** Squamous cell carcinoma of the hypopharynx is relatively rare, and most of them is diagnosed as advanced stage. Because of this specific characteristics, the combined treatment of surgery and radiotherapy has been preferred initial treatment. In surgical treatment, transoral resection was relatively unfavorable, however, it is superior in terms of preservation of laryngeal function. We reviewed the cases of transoral resection for the initial treatment of hypopharynx cancer. **방법:** We retrospectively reviewed 8 patients who underwent transoral resection for hypopharynx cancer during the last decade. There were 4 cases in stage I or II, and 4 cases in stage III or IV. 4 patients had cervical metastasis. All of them underwent transoral resection, and they underwent neck dissection for cervical metastasis. 2 patients needed tracheostomy to secure the airways. **결과:** In 5 cases, the resection margin was negative, and in 3, the margin was positive. 5 patients received adjuvant therapy. The mean follow-up period was 39 months after surgery. At the last follow-up, 7 cases were in NED state. All 8 patients were able to use the voice immediately after surgery, and the average time for resumption of oral diet was 2.9 days after surgery. **결론:** There is still controversy over which modality is superior in hypopharynx cancer. In this study, we selected transoral resection as initial treatment. 7 cases(87.5%) showed NED state at the last follow-up, indicating that the treatment outcome was not inferior to the previous reports. All patients had no postoperative voice complications and the average time for resumption of oral diet was 2.9 days(5~8 days in report with external approach). The limitations of this study are small number of cases, short follow-up periods and high adjuvant therapy

rate. Despite these limitations, we can suggest that, if properly selected, transoral resection may be a considerable option in terms of oncologic and laryngopharyngeal functional outcomes.

**HNOP-74 14:40~14:50**

#### **IMPACT ON QUALITY OF LIFE AFTER TREATMENT WITH PROTON PUMP INHIBITOR IN LARYNGOPHARYNGEAL REFLUX DISEASE PATIENTS**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HANYANG UNIVERSITY COLLEGE OF MEDICINE, HANYANG UNIVERSITY MEDICAL CENTER

HAE WON CHOI, HYUN WOONG JUN, JIN HYUK JUNG, CHANG MYEON SONG, KYUNG TAE, YONG BAE JI

**목적:** Several studies have assessed the impact of laryngopharyngeal reflux disease (LPRD) on health-related quality of life (HRQL), showing a significant impairment of HRQL. This study aims to assess the impact of proton pump inhibitor (PPI) treatment on HRQL. **방법:** We prospectively collected data from LPRD patients from Apr. 2017 to Jul. 2019. Patients who have reflux symptom index (RSI)  $\geq 13$  or reflux finding score (RFS)  $\geq 7$  were enrolled in this study. We assessed HRQL using questionnaire with EORTC QLQ-H&N35 on the first visit. Patients were treated with PPI (Esomeprazole 20mg/day) and visited at 1, 2, 3 months. Patients were randomly assigned to the treatment group once (20mg QD) or twice (10mg BID). RSI and RFS were measured at each visit and HRQL was reevaluated at the last visit. **결과:** 95 patients completed 3 months follow up and enrolled in this study. Female : Male ratio was 24:7 and mean age was  $57.0 \pm 11.9$  (27~80). Initial RSI and RFS were  $16.3 \pm 8.8$  and  $12.6 \pm 2.9$ , respectively. They were changed to  $11.1 \pm 9.7$  and  $9.7 \pm 2.6$  ( $p < 0.001$  in both) and there were no significant differences according to the

method of administration. RSI was lower than 13 in 28 patients (29.5%) and RFS was lower than 7 in only 3 patients (3.2%). Pain, speech problem, trouble with social eating, dry mouth, coughing, felt ill, pain killers, and nutritional supplement were significantly improved in HRQL questionnaire in RSI improvement group, whereas there was no significant improvement in RSI non-improvement group. **결론:** PPI administration is effective in treating the LPRD and its effects begin to appear in a month, but it would take more than 3 months for complete resolution in many cases. RSI is a more sensitive tool for evaluation of treatment effect. The HRQL was improved in the patients having RSI improvement.

#### HNOP-75 14:50~15:00

### ROLE OF INITIAL LARYNX PRESERVING SURGERY FOR HYPOPHARYNGEAL CANCER: A COMPARISON WITH DEFINITIVE RADIATION BASED TREATMENTS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, AND DEPARTMENT OF RADIATION ONCOLOGY, SAMSUNG MEDICAL CENTER, SUNKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, REPUBLIC OF KOREA,

DONGHYEOK KIM, SUNGMIN KOH, NAYEON CHOI, YOUNG-IK SON, DONGRYUL OH, YONG-CHAN AHN, HAN-SIN JEONG

**목적:** Due to the biologic and anatomic characteristics of hypopharyngeal cancer (HPC), currently non-surgical treatments have gained popularity to manage advanced HPC in the aspect of similar oncological outcomes and larynx preservation compared to radical surgery. In the selected cases, larynx preserving surgery (LPS) could achieve the acceptable outcomes in combination with adjuvant treatments. However, the role of LPS has not been yet extensively studied,

compared with the initial non-surgical treatments. **방법:** We retrospectively reviewed 216 HPC data, which met our inclusion criteria. To minimize the selection bias, the tumor status was re-evaluated and the cases which are amenable to LPS were only included in the non-surgical treatment group. The oncological and functional outcomes were compared between initial LPS with adjuvant radiation (OPRT, N=36) versus the definitive radiation alone (RT, N=56), and initial LPS with adjuvant chemoradiation (OPCCRT, N=31) versus the definitive chemoradiation (CCRT, N=93). **결과:** Most patients had T1-2 hypopharyngeal cancers, and T status were equally distributed in the comparison groups. LPS resulted in oncologically safe margin in 41.8%, close surgical margin in 31.3% and positive margin in 25.4%. In a comparison of OPRT vs RT, the survival outcomes and the rate of larynx preservation were not different. However, the survival rates were higher in the OPCCRT group compared with CCRT group, mainly due to higher local control and less cause specific death in OPCCRT group. The additional oncological benefit of neck dissection was not observed in our cohort regardless of nodal burden. **결론:** In resectable HPCs amenable to LPS, a trial of LPS could have some clinical benefits in terms of accurate diagnosis of primary tumor extent and better local control. However, the clinical efficacy of neck dissection even for high N status seems to be questionable compared with the definitive RT or CCRT, which require further studies.

#### HNOP-76 15:00~15:10

### THE ONCOLOGIC, FUNCTIONAL OUTCOMES AND LONG-TERM RESULT OF SUPRACRICOID PARTIAL LARYNGECTOMY(SCPL)

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

DONG-HYUN LEE, JUN-OOK PARK, YOUNG-HOON JOO, MIN-SIK KIM

**목적:** The aim of this study was to evaluate the oncologic, functional outcomes and long-term result of laryngeal squamous cell carcinomas treated patients who underwent supracricoid partial laryngectomy (SCPL). **방법:** The clinical data of 136 patients with laryngeal cancer who underwent supracricoid partial laryngectomy with cricohyoidoepiglottopexy (CHEP) or cricohyoidopexy (CHP) between 1993 and 2014 at Catholic university ENT were retrospectively reviewed. Ninety-seven patients including 17 cases of stage I, 44 of stage II, 28 of stage III and 8 of stage IV underwent CHEP and 39 patients underwent CHP. The nonextended and extended groups consisted of 107 and 29 patients. The effect of the type of surgery on functional and oncologic outcomes was assessed. **결과:** Mean NG tube removal time was 28.6 days and 23.4 days in CHP and CHEP patients. Mean decannulation time was 20.3 days and 16.8 days in CHP and CHEP patients. And there was a significantly higher delay of decannulation ( $p=0.038$ ) in the extended group. No significant difference was noted between the nonextended and extended group in NG tube removal time. Long-term follow up of recurrent patients ( $n=20$ ) for more than two years, recurrence is rare, but most of them had aspiration pneumonia due to having an arytenoid functional problem. Among the recurrent cases, ten in T4 and fourteen in moderate differentiation were analyzed. Five-year overall survival rate was 81.4%. The 3- and 5-year disease-free specific survival rates were 86.8 and 82.1%, respectively. **결론:** Supracricoid laryngectomy shows excellent oncologic and functional results for treatment of laryngeal cancer while maintaining laryngeal functions, especially in terms of local control rate and tracheostomy tube decannulation. Given the more extensive surgery applied for CHP, functional outcomes were better in patients with CHEP.

## HNOP 14

구강/인두/타액선 II

15:40~16:40 • 그랜드홀2

Chairperson(s) : 김세현(연세의대), 김정규(대구가톨릭의대)

**HNOP-77 15:40~15:50**

### SEARCHING PROTEIN-PROTEIN INTERACTION NETWORK-LEVEL GENE EXPRESSION AND METHYLATION PROFILE SIGNATURES TO DEVELOP A PREDICTIVE MODEL FOR LYMPH NODE METASTASIS IN EARLY ORAL CANCER

<sup>1</sup>BIO & HEALTH INFORMATICS LAB, SEOUL NATIONAL UNIVERSITY COLLEGE OF ENGINEERING, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL NATIONAL UNIVERSITY HOSPITAL, <sup>3</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL NATIONAL UNIVERSITY BORAMAE MEDICAL CENTER

MIN-SU KIM<sup>1</sup>, DO HOON LEE<sup>1</sup>, SOON-HYUN AHN<sup>2</sup>, SEONG KEUN KWON<sup>2</sup>, TACK-KYUN KWON<sup>3</sup>, SUN KIM<sup>1</sup>, DOH YOUNG LEE<sup>3</sup>

**목적:** This study aimed to analyze the gene expression and methylation profile signature for establish predictive model for lymph node metastasis in early oral cancer. **방법:** A total of 33 cases of tongue cancer with RNAseq and methylation data were enrolled in this study. For differentially expressed gene analysis, population-based search (PBS) algorithm or genetic algorithm was used to overcome the limitation of prediction with single-gene marker. The proposed method is a model for predicting lymph node metastasis in early oral cancer by discovering network-level gene

expression signatures based on the protein-protein interaction (PPI) network. Differentially methylated regions (DMR) and methylation at promotor was analyzed with methylation data, and final predictive model was extracted from both gene expression and methylation. **결과:** Of the 33 samples, 22 are lymph node metastasis negative and 11 are positive. Using the PBS algorithm, the model was able to distinguish between two groups of samples while learning the feature space that each dimension consists of adjacent genesets on the PPI network. A two-dimensional feature representation has been detected that successfully distinguishes the two groups. Genes that make up each dimension were enriched in gene sets well known to be involved in lymph node metastasis, such as focal adhesion, regulation of actin cytoskeleton, and neuroactive ligand-receptor interaction, based on the KEGG database. With DMR calling, regulation of cell motility, nervous system development, and regulation of focal adhesion assembly was significantly associated with lymph node metastasis. Regression model accuracy revealed the accuracy of prediction model using gene expression and methylation was 89%. **결론:** Cytoskeleton and cell-adhesion associated pathway is associated with early regional metastasis of oral cancer. Predictive model in our study is superior to other estimation with clinical parameters, therefore be possibly utilized in prospective study.

**HNOP-78 15:50~16:00**

### CLINICAL AND PATHOLOGICAL CHARACTERISTICS OF NEVER-SMOKED YOUNG FEMALE PATIENTS WITH ORAL CAVITY SQUAMOUS CELL CARCINOMA

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, EULJI UNIVERSITY SCHOOL OF MEDICINE, <sup>2</sup>DEPARTMENT OF OTOLARYNGOLOGY, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

MINSU KWON<sup>1</sup>, DONG GYU LEE<sup>2</sup>, YOON SE LEE<sup>2</sup>, JONG-LYEL ROH<sup>2</sup>, SEUNG-HO CHOI<sup>2</sup>, SOON YUHL NAM<sup>2</sup>, SANG YOON KIM<sup>2</sup>

**목적:** Although there are an increasing number of never smoked young patients especially in women with oral cavity cancer (OCC) worldwide, studies on those patients are insufficient. The aim of this study is to analyze the incidence, etiology and clinicopathologic characteristics of never smoked young female (NSYF) patients. **방법:** We retrospectively analyzed the medical records of patients diagnosed and treated with OCC at a single tertiary referral hospital from 2002 to 2016. Female never smoked patients who were under 45 years of age at the time of diagnosis classified as NSYF group. The clinical and pathologic characteristics of NSYF were compared to the other female OCC patients. **결과:** A total of 32 NSYF from 144 female OCC patients was identified, and the yearly increase in NSYF population was not significant during the study period. The mean body mass index of the NSYF group was significantly lower (21.5 *vs* 23.7 kg/m<sup>2</sup>, *p*=.001), however, there was no specificity in the NSYF group in terms of pretreatment patients' characteristics. And NSYF group did not demonstrate clinicopathologic difference including tumor-node-metastasis stages, depth of invasion and extranodal extension. The overall survival rate in NSYF group tended to be higher than other patients but without statistical significance (*p*>.05), and neither the OCC-specific nor recurrence-free survivals were different. **결론:** This study could not demonstrate the special characteristics of NSYF patients. Further investigations through various comparative analyzes including a more subjects also including male OCC patients would be necessary to characterize NSYF.

**HNOP-79 16:00~16:10**

**SURGICAL EXTENT AND ROLE OF POSTOPERATIVE RADIOTHERAPY OF SURGICALLY RESECTABLE, LOW-GRADE PAROTID CANCER**

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE

YOUNG MIN PARK, MIN SEOK KANG, DA HEE KIM, YOON WOO KOH, SE-HEON KIM, JAE YOL LIM, EUN CHANGE CHOI

**목적:** Histologic grade of parotid gland cancer is one of the major prognostic predictors. Due to its rarity, the optimal treatment modalities and prognostic factors of low-grade parotid gland cancers has not established yet. In this study, we tried to identify prognostic factors and the adequate treatment modalities in patients with low-grade parotid gland cancer. **방법:** We retrospectively analyzed the clinico-pathologic data from 291 patients with low-grade parotid gland cancer from 1999 to 2018. **결과:** Recurrence-free survival and overall survival were 80.6 and 84.4% at 10years, respectively. 56.1% patients received surgery alone and the remaining 43.9% patients received surgery with adjuvant radiotherapy. Resection margin status and perineural invasion (PNI) were significant unfavorable prognostic factor associated with disease recurrence. Surgical extent (total vs less than total) showed no significant effect on disease recurrence and patients' survival. The disease was well-controlled after surgery alone in patients having a clear surgical margin, even with microscopic clear margin of less than 1mm. Adjuvant radiotherapy did not show any significant benefits on controlling disease recurrence in patients with close (<5mm) or abutting margin (<1mm). Adjuvant radiotherapy significantly decreased loco-regional recurrence in patients with adverse pathologic features. **결론:** Oncological outcomes were good in patients with low-grade parotid gland cancer with surgery and radiotherapy. If a clear surgical

margin was obtained after surgery, local control rate of the disease was good, even with microscopic clear margin of less than 1mm. Adjuvant radiotherapy had a significant role in controlling loco-regional recurrence in patients with adverse pathologic features.

**HNOP-80 16:10~16:20**

**COMPARISON OF THE ONCOLOGICAL OUTCOMES BETWEEN SENTINEL LYMPH NODE BIOPSY AND SELECTIVE NECK DISSECTION IN CNO EARLY TONGUE CANCER**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SONGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, REPUBLIC OF KOREA

HOKYUNG JIN, WOORI PARK, HAN-SIN JEONG, YOUNG-UK SON, MAN KI CHUNG, CHUNG-HWAN BAEK

**목적:** In the previous study, occult metastasis of early tongue cancer has been found frequently. Sentinel lymph node biopsy (SLNB) has shown its diagnostic efficiency to find out occult metastasis in early tongue cancer. However, its role as a modality for neck management compared with selective neck dissection (SND) has not been proven. The purpose of this study is to compare the oncologic outcomes of selective neck dissection and sentinel node biopsy and find out the appropriate management for early tongue cancer without clinical node metastasis (cN0). **방법:** A retrospective review of the patients with cN0 early tongue cancer from 1995 to 2018 was performed. The data of preoperative image such as CT, PET/CT was evaluated for identifying the node metastasis. Overall survival and recurrence-free survival were compared between the two groups. **결과:** Total of 214 patients was enrolled in this study. 121 patients were in the SND group and 93 patients in the SLNB groups. Fi-

nal pathologic results revealed statistically significant difference ( $p < 0.001$ ). 15.7% of SND group were diagnosed positive node metastasis in final pathologic reports. None of SLNB group showed metastatic node. DOI of primary lesion of SND group was bigger than SLNB group ( $p = .001$ ). PNI was more found in SND group. Total 31 patients experienced recurrence; 17 patients of SND and 14 patients of SLNB. There was no difference between two groups in recurrence rate ( $p = 0.847$ ). OS and RFS of SLNB group were not differ with SND group (OS  $p = 0.246$ , RFS  $p = 0.979$ ). **결론:** Negative malignancy finding of sentinel node biopsy seems to be associated with less invasiveness of primary lesion including no perineural invasion which indicates the better prognosis. Moreover, there was no significant difference between the SND and SLNB groups in both OS and RFS. Sentinel node biopsy could be an alternative option of early tongue cancer with cN0 as less extensive management without unfavorable oncologic outcome compared with selective neck dissection

#### HNOP-81 16:20~16:30

### ENDOSCOPE-ASSISTED TRANSORAL ACCESSORY PAROTID MASS EXCISION MULTICENTER PROSPECTIVE OBSERVATIONAL STUDY

DANKOOK UNIVERSITY HOSPITAL, HEAD AND NECK ONCOLOGY CLINIC, NATIONAL CANCER CENTER, ILSAN  
SEUNG HOON WOO, PHIL-SANG CHUNG, SANG JOON LEE, JUN SUN RYU

**목적:** Transoral surgery is gaining favor because it has the advantage of leaving no scar after surgery. The aim of this study was to evaluate the technical feasibility and safety of endoscope-assisted transoral accessory parotid mass excision. **방법:** This study was designed as a 7-year, prospective, multicenter evaluation of endoscope-assisted transoral accessory parotid mass

excision. Clinical outcomes and complications related to the procedures were evaluated in patients. **결과:** Twenty patients underwent endoscope-assisted transoral accessory parotid mass excisions, and 22 patients underwent conventional parotidectomy approach excisions. There was no significant difference with respect to overall demographic characteristics between the groups. However, the operation times were shorter in the transoral approach group ( $P = 0.001$ ), and cosmetic satisfaction was much better in the transoral group ( $P < 0.001$ ). **결론:** Endoscope-assisted transoral accessory parotid mass excision is a potentially safe and effective procedure with excellent outcomes.

#### HNOP-82 16:30~16:40

### PROPOSED STAGING SYSTEM FOR CERVICAL METASTASIS OF UNKNOWN PRIMARY

DEPARTMENTS OF <sup>1</sup>OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, <sup>2</sup>PATHOLOGY, <sup>3</sup>RADIATION ONCOLOGY, AND <sup>4</sup>INTERNAL MEDICINE (ONCOLOGY), ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE  
WON KI CHO<sup>1</sup>, JONG-LYEL ROH<sup>1</sup>, KYUNG-JA CHO<sup>2</sup>, SANGWOOK LEE<sup>3</sup>, SUNG-BAE KIM<sup>4</sup>, SEUNG-HO CHOI<sup>1</sup>, SOON YUHL NAM<sup>1</sup>, SANG YOON KIM<sup>1</sup>

**목적:** Cervical metastasis from unknown primary (CUP) is commonly classified as advanced overall stage. P16 or human papilloma virus (HPV) positivity in metastatic lymph nodes (pLN) might be associated with a favorable survival outcome of CUP. Therefore, we evaluated the prognostic value of p16 or HPV so as to propose new staging system for CUP squamous cell carcinoma (SCC). **방법:** Cervical metastasis from unknown primary (CUP) is commonly classified as advanced overall stage. P16 or human papilloma virus (HPV) positivity in metastatic lymph nodes (pLN) might be associated with a favorable survival outcome of CUP. Therefore, we evaluated the prognostic value

of p16 or HPV so as to propose new staging system for CUP squamous cell carcinoma (SCC). **결과:** Post-operatively, primary tumors (PT) were found mainly in the oropharynx of 31 of 78 (39.7%) patients, of whom 46 (59.0%) patients remained a CUP. P16 positivity was found in 26 of 31 (83.9%) PT patients and 12 of 46 (26.1%) CUP patients, while HPV positivity was found in 22 of 31 (71.0%) PT patients and 6 of 46 (13.0%) CUP patients. No survival differences between the PT and CUP groups was found ( $P > 0.1$ ). P16 or HPV positivity was an independent factor of OS and DFS in both PT and CUP groups (all  $P < 0.01$ ). Our new staging system for CUP proposed four stages: I (p16+, pLN no.  $\leq 4$ ), II (p16+, pLN no.  $> 4$ ), III (p16-, pLN no.  $\leq 4$ ), IV (p16-, pLN no.  $> 4$  or ENE). The C-index of our proposed staging system showed improvement in OS prediction (0.786) compared with the AJCC 8th edition (0.758). **결론:** Our proposed staging system may improve prediction of post-treatment survival and recurrence in patients with CUP.

## HNOP 15

재건

15:40~16:40 • 세미나실2

Chairperson(s) : 안순현(서울의대), 이준규(전남의대)

**HNOP-83 15:40~15:50**

### FACTORS FOR FREE FLAP SALVAGE TRIALS IN 332 CASES OF HEAD AND NECK FREE FLAP RECONSTRUCTIVE SURGERY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

SE JIN HYUN, WON SHIK KIM, EUN-JAE CHUNG,

SEONG KEUN KWON, SOON HYUN AHN

**목적:** The purpose of this study was to determine the factors for salvage trial after head and neck Free Flap reconstructive surgery. **방법:** In total, 332 cases of free flap surgeries were included in this study. All surgeries were performed by a single head and neck surgeon. The data of 332 patients who underwent free flap reconstructive surgery, between January 2004 and July 2019, were reviewed retrospectively. Patient demographic and surgical data that may have an influence on free flap outcomes were evaluated. **결과:** Of the 332 cases, 73% of surgery was performed without pre-treatment at the anastomotic site, 3.5% had previous neck dissection, 13.7% had a anastomosis at the previous radiotherapy field, and 7% had a anastomosis at both previous radiotherapy and neck dissection field. In each cases, 13.3%, 12.5%, 19.4%, and 10.1% required a flap salvage trials. flap failures were 5.5%, 2.1%, 9.7%, and 4.5%. There was no statistically significant difference (flap salvage trials  $P = .808$ , flap failures  $P = .918$ ). In the analysis of factors for salvage trials, a duration of operation greater than 12 hours (compared with  $\leq 12$  hours; OR, 2.74; 95% CI, 1.27 to 5.92;  $P = .010$ ) was statistically significant factors for salvage trials. Use of postoperative low molecular weight heparin (Enoxaparin) was associated with improved free-flap outcome. (OR, 0.324; 95% CI, 0.12 to 0.90;  $P = .031$ ) **결론:** Surgery by an experienced surgeon and use of postoperative low molecular weight heparin may reduce the risk of salvage trails in head and neck free-flap reconstructive surgery.

**HNOP-84 15:50~16:00**

### COMPARISON OF SURGICAL AND MEDICAL COMPLICATIONS BETWEEN SCAPULAR FREE FLAP AND FIBULAR FREE FLAP IN HEAD AND NECK CANCER



DEPARTMENTS OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY AND (2) PATHOLOGY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE, SEOUL, REPUBLIC OF KOREA

DONGHYEOK KIM, WOORI PARK, HAN-SIN JEONG, YOUNG-IK SON, MAN KI CHUNG, CHUNG-HWAN BAEK

**목적:** The scapular free flap (SFF) and the fibula free flap (FFF) are widely used osteocutaneous flap for reconstruction in head and neck cancer surgery. The purpose of this study is to compare the postoperative complications and outcomes between SFF and FFF. **방법:** The data of patients who had undergone osteocutaneous flap due to defects after head and neck cancer surgery from 1996 to 2018 was collected. Defect site and size, concurrent soft tissue reconstruction, surgical/medical complications and functional outcome such as diet were compared between SFF and FFF group. **결과:** 39 patients were SFF group and 81 patients had FFF. Defect site and size were different between two groups ( $p=0.000$ ). Half of SFF were used in sinonasal defect and most of FFF was in oromandibular defect. 48.6% of SFF and 70.3% of FFF cases were diagnosed advanced stage. Both group showed similar rate of concurrent soft tissue reconstruction (31.0% vs 24.2%,  $p=0.402$ ). SFF group usually used latissimus dorsi which can be harvested at the same incision site. But, most patients in FFF group had to take it apart from fibula such as anterolateral thigh free flap or pectoralis major myocutaneous flap. Incidence rate of recipient site complication was not different (31.0% vs. 26.4%,  $p = 0.584$ ). 8 patients (8.8%) of FFF group suffered from donor site complication, since none of SFF group ( $p = 0.056$ ). Medical complication and diet were comparable in two groups. But, critical medical problems such as myocardial infarction or arrhythmia were found only in FFF group. Hospital days were shorter in SFF group than FFF ( $p=0.021$ ). **결론:** FFF is more proper in larger defect than scapu-

la. But, it is required longer hospital stay and has risk of severe medical problem. SFF has less morbidity in donor site without significant medical complications, consequently shorter hospital stay. The SFF could be considered as an alternative option for elderly patients, especially who have severe medical problem in selective reconstruction cases.

**HNOP-85 16:00~16:10**

### ANALYSIS OF CLINICAL PROGNOSTIC FACTORS IN HEAD AND NECK SARCOMA PATIENTS

DEPARTMENT OF OTORHINOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, SOUTH KOREA

YEONJOO CHOI, AH RA JUNG, YONG HAN KIM, YOON-SE LEE, JONG-LYEL ROH, SEUNG-HO CHOI, SANG YOON KIM, SOON YUHL NAM

**목적:** Head and neck sarcomas (HNS) comprise a rare group of malignant mesenchymal neoplasms that represent <1% of all head and neck tumors. Because of the rarity of HNS, treatment guidelines remain poorly characterized with a lack of clinical evidence in regard to definitive management. The aim of this study is to identify the patient and tumor characteristics of HNS in one single center. Moreover, we investigated which patient, tumor, and treatment factors had prognostic significance for overall survival (OS) and recurrence-free-survival (RFS). **방법:** The study was retrospectively reviewed the medical records of consecutive patients who previously untreated, pathologically proven HNS at Asan medical center from January 2004 to December 2018. Exclusion criteria were patients who were referred with recurrent tumors and follow-up duration less than 1 years. Cox proportional hazards regression analyses and Kaplan-Meier analyses were used to determine clinical prognostic factors of HNS and OS or RFS. **결과:** A

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70 HNS patients aged from 1 to 85 year-old were enrolled. The mean age was  $50.61 \pm 23.67$  year-old, and mean follow up period was  $46.75 \pm 44.50$  months. Male (n=45) was dominant than female (n=25) and the most common primary tumor site was head and neck skin and soft tissue (51.42%). Undifferentiated and unclassified pleomorphic, round cell, epithelioid, and not-otherwise-sarcoma such as undifferentiated sarcoma with spindle cell, specified subtypes was the most common histology (22.86%). Only surgery was the most frequently performed treatment modality in HNS patients (37.14%). OS was  $48.78 \pm 43.30$  months and RFS was  $32.73 \pm 35.10$  months. Kaplan-Meier analysis demonstrated that tumor size and Federation Nationale des Centres de Lutte le Cancer (FNCLCC) tumor grade were strongly associated with OS ( $p < 0.05$ ) in HNS patients. **결론:** Sarcoma is one of the most rare neoplasms occurred in head and neck area. This study demonstrated that tumor size and grade are significant predictive factors for HNS.

#### HNOP-86 16:10~16:20

### IS SUBMENTAL FLAP SAFE FOR THE ONCOLOGICAL RECONSTRUCTION OF THE TONSIL CANCER?

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

GEUN-JEON KIM, DONG-HYUN LEE, JUN-OOK PARK, GWANG-JAE JO, MIN-SIK KIM

**목적:** In harvesting the submental flap, level I lymph node(LN) may be included for preserving the vascular pedicle. If cancer may metastasize to the level LN, that must not be a safe operation by leaving the metastatic LN. We investigate the oncological outcome to evaluate the safety of submental flap for reconstruction in tonsil cancer especially focusing the level Ia LN. **방법:** This retrospective analysis included 158 patients with

tonsillar cancer treated by surgery between 2000 and 2016, with >30months of follow-up at a single-institution. We reviewed the post-operative pathological lymph node state in level I and other oncological outcomes. **결과:** In elevating the submental flap, LN level Ia cannot be dissected for preserving vascular pedicle of the flap but level Ib can dissect safely. In 158 patients, all patients had modified radical neck dissection including level I LN. Pathological N stage negative cases were 46 cases and N positive 112 cases. Fourteen patients of N positive patients showed level I involvement in the post-operative pathological result (13.4%, in node positive patients). Among the level I involvement 15 cases, there's no level Ia involvement, only level Ib. Also, level I positive patients showed multi-level lymph node involvement compared to the level I negative patients. (involved more than 2 lymph node levels; 14 cases in negative patients (93.3%) vs. 33 positive patients in negative patients (34.2%). **결론:** A subset of patients with tonsil cancer managed by transoral surgery and postoperative radiation therapy (PORT) may develop soft tissue necrosis (STN). The role of flap was thought to be important in preventing this serious condition. The submental flap is easy and safe method to use the reconstruction even in N(+) tonsillar cancer without leaving any metastatic LN.

#### HNOP-87 16:20~16:30

### HOW TO PREPARE THE DECELLULARIZED VASCULAR SCAFFOLD

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, <sup>2</sup>DEPARTMENT OF INTERNAL MEDICINE, <sup>3</sup>DEPARTMENT OF PLASTIC SURGERY, <sup>4</sup>DEPARTMENT OF PATHOLOGY

JIN-CHOON LEE<sup>1</sup>, EUI-SUK SUNG<sup>1</sup>, BYUNG-JOO LEE<sup>1</sup>, SUNG-CHAN SHIN<sup>1</sup>, HYUN-KEUN KWON<sup>1</sup>, WONJAE CHA<sup>1</sup>, SOO-GEUN WANG<sup>1</sup>, EUN-HEE KIM<sup>2</sup>, JI-MIN CHUN<sup>2</sup>, JOO-IN KIM<sup>2</sup>, SANG-SOO KIM<sup>2</sup>, IN-

JOO KIM<sup>2</sup>, JOO-HYUNG KIM<sup>3</sup>, KYEONG-WOON CHOI<sup>4</sup>

**목적:** If transplantation is needed because of irreversible damage to tissues or organs, allogeneic organ transplantation from a donor is currently the most common treatment. In this case, immunological suppression against tissue rejection is inevitably necessary. Due to the side effects of immunological suppressants, the function of the transplanted organ will be compromised if it has been over several decades after transplantation. Therefore, research on new organ transplantation techniques that have no rejection reaction using tissue engineering techniques has been actively promoted. The purpose of this study is to create decellularized scaffold with proper blood supply using rat kidneys. **방법:** Four Sprague Dawley rats were used and one kidney of each rat was harvested. And then it was decellularized after chemical removal using 1% Triton X-100 and 0.75% SDS. Decellularized kidney was transferred into living rat with vascular anastomosis at muscular pocket. After implantation, adipose tissue derived stem cell (ADSC) was injected into anastomosed decellularized kidney. After 4 weeks, anastomosed decellularized kidney with injected ADSC was harvested and pathologic evaluation was done. **결과:** Compared to normal kidney, decellularized kidney had no Kidney DNA. On pathologic evaluation, viable adipose cell was identified at anastomosed decellularized kidney. **결론:** We created the decellularized scaffold with proper blood supply using rat kidneys and it is expected to act as a vascular scaffold without rejection.

**HNOP-88 16:30~16:40**

## COMPARISON RANGE OF TOTAL AND NEAR-TOTAL GLOSSECTOMY

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK

SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

GEUN-JEON KIM, DONG-HYUN LEE, JUN-OOK PARK, GWANG-JAE JO, MIN-SIK KIM

**목적:** The extent of surgical resection may be the most important factor affecting function. We measured the size of the preoperative tumor and the volume of the reconstructed flap after surgery to evaluate the extent of resection according to the size of the preoperative tumor. Furthermore, we evaluated the pronunciation & swallowing function after the operation. **방법:** A retrospective analysis was performed on 46 patients who were classified as either near-total glossectomy or total glossectomy for the period 2000 to 2016. The preoperative MRI was used to determine the location of the cancer and the proportion of the normal tongue and evaluated the ratio of postoperative remnant tongue and flap volume. We evaluated the functional outcome through video-fluoroscopic swallowing study score and the accuracy rate of consonant sound performed 6 months after surgery. **결과:** The preoperative tumor volume was 11.3–52.3cm<sup>3</sup> (mean 29.1cm<sup>3</sup>) and the postoperative flap volume was 45.7%–100% (mean 73.5%). When compared with the functional outcome, it was confirmed that the flap volume was more than 70%, and the function was significantly lower than that of the flap volume. (VFSS;  $p < 0.00$ , accuracy rate of consonant sound;  $p = 0.042$ ) Also, apart from the volume occupied by the flap, the accuracy rate of consonant sound decreased with the distance between the flap and the soft palate ( $p = 0.004$ ) and with the smaller volume of the entire tongue ( $p = 0.035$ ). The cut-off value of the volume was 58cm<sup>3</sup> based on the accuracy rate of consonant sound of more than 60%. **결론:** At this point, there is no known result for adequate range of near-total glossectomy. Then, we tried to figure out the range of the near-total glossectomy through measured the pre-operative tumor volume and proportion of the

post-operative flap. These may would not possible to generalize this result, but we could figure out the range of near-total glossectomy, 45 to 70%, which can be used as a guideline when determining the glossectomy. Also, total volume of the tongue has to exceed at least 58cm<sup>3</sup> to obtain the good accuracy rate of consonant sound.

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비과

08:00~10:00 • 세미나실6

Moderator : 김선태(가천의대), 조석현(한양의대)

**RHTPP-01 08:00~08:04****IS BRONCHIOLITIS ASSOCIATED WITH SINUSITIS?  
A NATIONWIDE 10-YEAR FOLLOW-UP COHORT  
STUDY**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, CHONBUK NATIONAL UNIVERSITY MEDICAL SCHOOL, JEONJU, SOUTH KOREA, <sup>2</sup> DEPARTMENT OF INTERNAL MEDICINE, RESEARCH CENTER FOR PULMONARY DISORDERS, CHONBUK NATIONAL UNIVERSITY MEDICAL SCHOOL  
JONG SEUNG KIM<sup>1</sup>, SAM HYUN KWON<sup>1</sup>, JAE SEOK JEONG<sup>2</sup>, YONG CHUL LEE<sup>2</sup>

**목적:** Bronchiolitis is a disease that causes nonspecific inflammation mainly in small airways except interstitium. The main types are bronchiolitis obliterans, acute bronchiolitis, proliferative bronchiolitis, follicular bronchiolitis, respiratory bronchiolitis, airway centered interstitial fibrosis, and diffuse panbronchiolitis. Sinusitis is a disease that cause the inflammation or infection in the sinus, which is another respiratory mucosa covered with ciliated pseudostratified columnar epithelium. We took notice of the relationship between the chronic sinusitis and bronchiolitis.

**방법:** We used 2% sample data of NHIS (National Health Insurance Service), which is stratified random sampling of 50 million Koreans considering age, sex, residence area, income, etc. We defined bronchiolitis except acute infectious cause as a patient with a diagnostic code of J448 or J684 in patients who had a CT scan of patients over 20 years old who visited

clinic or hospital in South Korea from 2002 to 2003. The 1:4 propensity score matching was performed to obtain the non-bronchiolitis (control) group from 2002 to 2003. **결과:** Control group (non-bronchiolitis) had 5808 individuals and the bronchiolitis group had 1452. The definition of end point in this study was the occurrence of sinusitis during 10-year follow-up period. The risk of developing sinusitis between the bronchiolitis and non-bronchiolitis groups was compared according to age, gender, residential area, and income level. The HR (hazard ratio) was investigated for the occurrence of sinusitis during the follow-up period for 10 years using univariate and multivariate Cox regression models. After adjusting for factors such as sex, age, residential area, and socioeconomic status, sinusitis was more frequent in the bronchiolitis group compared with the non-bronchiolitis group. (HR = 1.27; 95%CI: 1.10-1.46) **결론:** Sinusitis is more frequently observed in the bronchiolitis group during a 10-year follow-up in this cohort study.

**RHTPP-02 08:04~08:08****PREVALENCE AND COMORBIDITIES OF BRONCHIOLITIS: A NATIONWIDE POPULATION-BASED STUDY IN SOUTH KOREA**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, CHONBUK NATIONAL UNIVERSITY MEDICAL SCHOOL, JEONJU, SOUTH KOREA, <sup>2</sup>DEPARTMENT OF INTERNAL MEDICINE, RESEARCH CENTER FOR PULMONARY DISORDERS, CHONBUK NATIONAL UNIVERSITY MEDICAL SCHOOL

JONG SEUNG KIM<sup>1</sup>, SAM HYUN KWON<sup>1</sup>, JAE SEOK JEONG<sup>2</sup>, YONG CHUL LEE<sup>2</sup>

**목적:** Bronchiolitis refers a disease that cause the non-specific inflammatory injury to the small airways, often sparing a considerable portion of the interstitium. Until now, the prevalence, mortality, comorbidities, and medical expenditure for bronchiolitis

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have not yet been elucidated. We will investigate it through this study. **방법:** We used 2% sample data of NHIS (National Health Insurance Service), which is stratified random sampling of 50 million Koreans considering age, sex, residence area, income, etc. We defined bronchiolitis except acute bronchiolitis (J21) as a patient with a diagnostic code of J448 or J684 in patients who had a CT scan of patients over 20 years old who visited clinic or hospital in South Korea from 2002 to 2013. We excluded acute bronchiolitis (J21) and cystic fibrosis (E84). **결과:** The overall prevalence of bronchiolitis was 688 cases per 1,000,000. In terms of comorbidity, asthma (52.2%) was the most common, followed by HTN (43.7%), GERD (30.6%), DM (22.8%) and osteoporosis (17.9%). Other comorbidities were cerebrovascular disease (16.9%), angina (14.4%) and peripheral vascular disease (13.4%). Medicare spending on bronchiolitis averaged about 465,000 won (350 euros) per person per year. The mortality rate was the highest due to any cancer (512 cases, 6.2%), followed by bronchiolitis (270 cases, 3.3%), followed by cerebrovascular disease (90 cases, 1.1%), and pneumonia (68 cases, 0.8%). Among the cancer mortality, 229 cases (2.8%) of lung or bronchi cancers accounted for half of all cancers. **결론:** Bronchiolitis is an underestimated, burdensome disorder with various medical comorbidity, and further study is needed for further conceptualization and pathobiology.

RHTPP-03 08:08~08:12

### MUCOSAL HEALING OF NASAL SEPTUM IN AN EXPERIMENTAL RABBIT MODEL OF MUCOSAL INJURY

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HYUNG GU KIM<sup>1</sup>, SUNG WOO CHO<sup>2</sup>, HYUN JIK KIM<sup>1</sup>, DONG-YOUNG KIM<sup>1</sup>, CHAE-SEO RHEE<sup>1</sup>, TAE-BIN WON<sup>2</sup>

**목적:** 내시경의 발달에 따라 비내접근법을 이용한 수술이 증가하고, 수술 후 비중격피판을 이용한 결손부위 재건이 지속적으로 증가하고 있다. 점막의 결손부위는 피부이식, 자유피판을 이용하여 복원하고 있는데, 이런 복원 방법은 공여부의 통증, 감염, 반흔형성 등의 합병증이 발생할 수 있다. 따라서 생리적이면서 공여부 이환률이 없는 새로운 방식의 비점막 결손부위 재건법이 필요한 상태이다. 본 연구에서는 Guardcel®을 이용한 점막재생의 치료 효과를 비교 분석하여 최적의 치료법을 확인하고, 수술 후 발생하는 비점막결손의 치료에 적용하고자 한다. **방법:** 평균 체중 3kg의 New Zealand White rabbit을 5마리씩 세 군으로 나누어 A군은 양성대조군, B군은 silicon nasal splint 적용군, C군은 Guardcel® 적용군으로 정의한다. Ketamine 마취 하에 비강을 개방하고 좌측 비중격에 지름 7mm의 점막 결손부위를 만든다. A군은 그대로 수술부위를 봉합하고 B군은 결손부위를 silicon nasal splint로, C군은 Guardcel®로 덮어준다. A, B군은 추가 처치없이 2주간 관찰, C군은 1주 후 Guardcel® 제거 후 추가로 1주동안 관찰하여 총 2주간 관찰한다. 2주후sacrifice하여 점막 복정도를 평가한다. 채취한 비중격에서 남아있는 결손부위의 면적을 측정, 처음 결손면적과 비교하여 회복정도(%)를 평가한다. 또한 H&E 염색에서 점막 손상을 가한 쪽의 점막두께와 손상을 가하지 않은 정상 쪽 점막두께의 비율(mucosal thickness index, MTI)을 구해 각 군별로 비교한다. 또한, 세포증식표지자인 Ki-67과 혈관내피생성인자(VEGF) 염색을 실시하여 각 군별로 발현정도를 비교한다. **결과:** 점막결손면적을 측정하여 비교한 결과 아무런 처치를 하지 않은 A군의 경우 평균 72.4%, B군의 경우 평균 84.1%, C군의 경우 평균 96.6%의 점막회복률을 보여 Guardcel® 적용군의 회복률이 가장 높았고 양성대조군의 회복률이 가장 낮은 것으로 나타났다. Mucosal thickness index(MTI)

의 경우, A군은 평균 0.416, B군은 평균 0.473, C군은 평균 1.488의 회복정도를 보여 Guardcel® 적용군에서 점막의 증식이 가장 많이 일어났음을 확인하였다. Ki-67, VEGF 역시 Guardcel® 적용군에서 가장 많이 발현됨을 확인할 수 있었다. **결론:** 비점막 결손모델에서 Guardcel®이 점막재생에 있어 우수한 결과를 보였으며, 수술 후 발생하는 비점막결손의 치료에 효과적으로 쓰일 수 있을 것으로 판단된다.

#### RHTPP-04 08:12~08:16

### THE IMPACT OF SOCIOECONOMIC STATUS ON HOSPITAL ACCESSIBILITY IN OTORHINOLARYNGOLOGICAL DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL METROPOLITAN GOVERNMENT-SEOUL NATIONAL UNIVERSITY BORAMAE MEDICAL CENTER, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

JOON KON KIM, SEUNG-NO HONG, DAE WOO KIM

**목적:** The rate of health care utilization is affected by socioeconomic status (SES), especially in the low-SES population. While otolaryngological problems are the most common reason for hospital visit, less is known about the actual association between SES status and hospital visit among otolaryngological diseases. The aim of this study was to investigate the impact of socioeconomic status on hospital accessibility according to disease severity. **방법:** A retrospective study was conducted during a period of 20 years (2000–2019). otolaryngological diseases included chronic rhinosinusitis (CRS), sensorineural hearing loss (SNHL), oral ulcer and malignant neoplasm. Age- and sex-matched 100 patients were assigned to each disease group. SES and disease severity of each patient were evaluated at the first hospital visit. A logistic regression model was employed to assess the effect of SES on the severity of each disease. **결과:** A total of 400 (M:F =

45.75%:54.25%) patients were enrolled. The mean age was  $62.42 \pm 5.54$  (M: 61.13, W: 60.92). The severity of CRS increased in lower SES (OR: 0.751, 95% CI: 0.576–0.965, Chisq: 4.827,  $P = 0.028$ ). The severity of SNHL (OR: 0.747, 95% CI: 0.569–0.971, Chisq: 4.592,  $P = 0.032$ ) and oral ulcer (OR: 0.9, 95% CI: 0.160–0.501, Chisq: 17.699,  $P < 0.001$ ) were also associated with SES status. In contrast, the cancer stage showed no differences between low and high SES status groups (OR: 1.031, 95% CI: 0.761–1.394, Chisq: 0.038,  $P = 0.845$ ). **결론:** CRS, SNHL and oral ulcer patients had a more severe disease status in low SES than in high SES at the first hospital visit. Efforts to increase hospital accessibility for low SES otolaryngological patients should be made.

#### RHTPP-05 08:16~08:20

### HYPERTENSION INCREASES THE RISK AND SEVERITY OF EPISTAXIS: A NATIONAL WIDE POPULATION-BASED STUDY

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**목적:** The association between hypertension and risk of epistaxis and their causal relationship were subjects of longstanding debate. The study aimed to evalu-

ate the causal relationship between hypertension and the risk of epistaxis and to determine the influence of hypertension on the severity of epistaxis in a national population-based cohort **방법:** The National Health Insurance Service-National Sample Cohort is a population-based cohort represents the entire population, from 2002 to 2015. Hypertension cohort was defined as patients who used medical services three times or more and received anti-hypertension medication under the diagnostic code of essential hypertension in ICD- 10. A control cohort consisted of non-hypertension subjects with socio-demographically matched in a ratio of 1:1. The incidence of epistaxis and management of epistaxis were evaluated. A total of 35,749 hypertension patients and the same number of matched controls were identified. **결과:** The incidence rates (IR) of epistaxis in hypertension and controls were 1.95 and 1.35 per 1000 person, respectively (Ratio of IR, IRR=1.44, 95% CI 1.28-1.62). In univariate analysis, hypertension was the only meaningful risk factor for epistaxis (HR 1.468, CI=1.30-1.65). Multivariate analysis by adjusting gender also showed the significant HR of 1.47 (CI=1.31-1.65). Also, patients with hypertension were significantly more likely to receive invasive management ( $p=0.036$ ) **결론:** Hypertension increased the risk and severity of epistaxis. Medical counseling concerning epistaxis should be considered for individuals with hypertension.

RHTPP-06 08:20~08:24

### CGRP INCREASES THE EXPRESION OF ANTI-INFLAMMATORY CYTOKINES IN TH2 OF CRSWNP PATIENTS

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**목적:** CRSwNP is a chronic inflammatory disease, evidence of chronic sinonasal inflammation . Recently, many studies have reported the important role of CGRP related to inflammatory response relation. However, no evidence potential association between CGRP in CRSwNP have been reported. **방법:** The endotype was classified using H&E stain in the tissue of CRSwNP patients. Distributions of  $\alpha$ - and  $\beta$ -CGRP were verified using immunofluorescence method. Protein expression and mRNA level of  $\alpha$ - and  $\beta$ -CGRP were measured using western blot and RE-PCR. In addition, the distribution of CGRP receptor and GATA-3 in the patient tissue were confirmed using immunofluorescence. FACS was used to analyze the cellular composition of nasal polyp tissue after treated with CGRP receptor, GATA-3 and IL-5 in DNPCs. In addition, the expression of IL-5, IL-13, IL-17A were determined by DNPCs cultured which treated with beta-CGRP. **결과:** Our result confirmed that  $\beta$ -CGRP was increased in ECRSwNP and  $\alpha$ -CGRP increased in N-ECRSwNP compared to control groups.  $\alpha$ - and  $\beta$ -CGRP were distributed in epithelium and lamina propria. Protein expression and mRNA level confirmed that  $\beta$ -CGRP was increased in ECRSwNP and  $\alpha$ -CGRP was increased in N-ECRSwNP compared to control groups. In addition, CGRP receptor and GATA-3 are distributed in lamina propria and more than 90 percent are merged. The immune cells that make up the CGRP receptor, GATA-3 and IL-5 were identified as Th2 cells and ILC2. levels of IL-5, IL-13, IL-17A were found to increase after  $\beta$ -CGRP was treated in DNPCs. **결론:** Our study suggested that CGRP plays a key role in the inflammatory response by increasing the expression of anti-inflammatory cytokine in the inflammatory disease CRSwNP.



RHTPP-07 08:24~08:28

**CLINICAL ANALYSIS OF CONJUNCTIVODACRYOCYSTORHINOSTOMY OUTCOME**

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**목적:** 비루관 폐쇄의 치료인 결막누낭비강문합술 (Conjunctivodacryocystorhinostomy, CDCR)는 상, 하 누점이나 누소관 또는 충누소관의 폐쇄가 있거나, 각각의 구조물이 발달하지 않거나, 누소관보다 근위부의 해부학적 완전 폐쇄로 인한 눈물 배출 기능 장애에 드물게 시행한다. 본 연구는 결막누낭비강문합술을 시행받은 환자군의 특징 및 임상적 결과와 합병증 등을 분석하고자 하였다. **방법:** 2006년 부터 2019년 까지 근위부 비루관 폐쇄로 진단 후 결막누낭비강문합술을 시행받은 12명을 대상으로 하였다. 환자의 성별, 근위부 폐쇄원인, 발생일, 외상 유무, 환자의 주관적 증상 호전 정도, 수술부위 상태 및 튜브의 위치에 대한 객관적 결과, 합병증 및 재수술의 원인 등을 후향적으로 분석하였다. **결과:** 대상환자는 12명이며, 남자는 7명(58%), 여자는 5명(41%)이었고, 평균연령은 46세(24세~73세)였다. 평균 발병일은 2.22년, 추적관찰기간은 평균 1.94년이었다. 외상으로 인한 증상 발생은 7명(58%), 의인성 원인은 1명(8%), 해부학적 폐쇄가 4명(33%)이었다. 수술에 따른 치료 성적인 환자 주관적 증상 호전은 7명(58%), 술자가 평가한 객관적 상태 평가 우수는 7명(58%), 재수술 시행은 7명(58%) 이었다. 재수술을 한 7명에서 평균 1.57회의 추가수술이 시행되었으며, 재수술 후 주관적 증상호전은 3명(42%), 객관적 상태 우수는 2명(28%)이었다. 재수술의 원인으로는 눈물흘림 지속이 6안, Jones 튜브 빠짐 5안, 튜브 막힘 및 손상 3안, 안과적 합병증이 1안이었다. 외상 및 의인성이 원인인 환자 8명의 주관적 증상 호전은 5명(62%), 객관적 상태 우수는 4명(50%), 재수술 시행은 5명(62%)이었으며, 외상이 없는 해부학적인 폐쇄 환자 4명의 주관적 증상 호전은 2명(50%), 객관적 상태 우수는 3명(75%),

재수술은 1명(25%)이었다. 외상 및 의인성 유무에 따른 주관적, 객관적 치료효과 및 재수술에 대한 통계적 유의성은 보이지 않았다. **결론:** CDCR 환자군의 첫 수술 시 주관적 증상 및 객관적 상태는 각각 58%의 호전을 보였다. 재수술 시 주관적 증상 호전은 42%, 객관적 상태 우수는 28%로 재수술에 대한 성공률이 우수하지 않음을 확인할 수 있었으며, 외상 유무에 따른 임상적인 차이는 없었다.

RHTPP-08 08:28~08:32

**IS SEPTAL DEVIATION ASSOCIATED WITH HEADACHE? A NATIONWIDE 10-YEAR FOLLOW-UP COHORT STUDY**

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**목적:** To investigate the potential relationship between septal deviation and headache using nationwide representative cohort sample data. **방법:** This study used a nationwide cohort sample from the Korean National Health Insurance Service database. The cohort sample was composed of 1 million patients, which is obtained by propensity score matching from 2002 to 2013. There were 9171 individuals in the SD group and 28243 in the non-SD group. The Kaplan-Meier survival analysis, the log-rank test, and Cox proportional hazard regression analysis were used to calculate the incidence, survival curve, and hazard ratio (HR) of headache for each group. **결과:** There were no statistically significant differences in sex ( $p = 0.7708$ ), age ( $p = 0.991$ ), residential area ( $p = 0.9626$ ), or socioeconomic status ( $p = 0.9982$ ) between the two groups. The survival curve between SD and non-SD showed a statistically significant difference. The adjusted HR for headache incidence during the 10-year follow-up

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period of the SD group was 1.37 (95% CI: 1.31– 1.43).

**결론:** This cohort study suggests that septal deviation is associated with headache. Therefore, these findings suggest that septoplasty can be considered as one of the treatment option in SD patients with headache.

**RHTPP-09 08:32~08:36**

### DRUG-INDUCED SLEEP ENDOSCOPY : RESULT AND EVALUATION OF CASES WE EXPERIENCED

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**CHUNG MAN SUNG, JONG MIN PARK, HONG CHAN KIM, HYUNG CHAE YANG**

**목적:** To describe drug induced sleep endoscopy findings of patients with sleep-disordered breathing in Korea and to assess associations with body mass index and polysomnographic parameters. **방법:** A total of 594 patients underwent polysomnography and DISE. DISE findings were reported using VOTE classification system. Associations were analyzed between PSG results, patient characteristics, and DISE findings. **결과:** Vellum collapse was seen most frequently(78%) and Multilevel collapse was noted in 48% of all patients. Multilevel collapse, vellum collapse, oropharynx collapse are significantly associated with higher apnea hypopnea index and increased BMI. But tongue base is not statistically significantly associated with AHI and BMI. Epiglottic collapse is significantly associated with lower AHI and BMI. **결론:** This study provides an overview of upper airway obstruction patterns in Korean patients who underwent DISE.

**RHTPP-10 08:36~08:40**

### COMPARISON OF ANALYZING POLYSOMNOGRA-

### PHY BETWEEN AUTOMATED SCORING AND MANUAL SCORING

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**목적:** 수면다원검사의 급여화는 급격한 검사건수 증가와 수면검사실 및 검사자의 부족을 야기하였다. 이에 본 연구에서는 레벨 I 수면검사장비 중, 수면검사의 자동판독과 검사실 외에서도 검사가 가능한 장비를 선택하여, 수면다원검사 판독에 있어 자동화 판독과 검사자 판독간의 차이가 있는지 확인해보고자 함. **방법:** 2019년 4월 1일부터 2019년 7월 27일까지 수면다원검사 NOX A1 프로그램을 통해 수면다원검사를 시행한 20명의 데이터를 통해 수면 잠복기, REM수면 잠복기, 총수면시간, 수면단계정도, 무호흡-저호흡 지수를 비교해 봄. **결과:** 환자들의 평균 나이는  $46.50 \pm 15.893$ 살, BMI는  $24.975 \pm 3.7989$ kg/m<sup>2</sup>로 Wilcoxon 부호순위 검정에 따르면 자동화 판독과 검사자 판독간에 총수면시간, REM수면 잠복기, 입면 후 각성시간, 수면 잠복기, 저호흡 지수, 수면단계 정도에서 통계적으로 유의미한 차이가 있었음. 반면에 수면 잠복기, 무호흡, REM 수면 비율은 유의미한 차이를 보이지 않았음. **결론:** 현재까지 개발된 수면다원검사 자동판독은 검사자 시행한 판독과 유의미한 차이를 보이고 있다. 따라서, 자동화 판독뿐만 아니라 검사자 판독을 통한 진단이 필요할 것으로 사료됨.

**RHTPP-11 08:40~08:44**

### NOCTURNAL HEART RATE VARIABILITY MAY BE USEFUL FOR DETERMINING THE EFFICACY OF MANDIBULAR ADVANCEMENT DEVICES IN OBSTRUCTIVE SLEEP APNOEA

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HYUNG-CHAE YANG

**목적:** The effect of mandibular advancement device (MAD) therapy on cardiac autonomic modulation remains unclear. This study aimed to evaluate the effect of MAD on the nocturnal heart rate variability (HRV) in obstructive sleep apnoea (OSA). **방법:** Anthropometric data, questionnaire results, and HRV parameters (evaluated using time- and frequency-domain methods) of 58 adult patients with OSA treated via MAD therapy were retrospectively reviewed. All patients underwent polysomnography at the baseline and at the 3-month follow-up. **결과:** The average normal-to-normal (NN) interval, standard deviation of the NN interval, low-frequency power in normalized units (LFnu), and high-frequency power in normalized units (HFnu) showed significant changes with MAD therapy. Based on the criteria for success (a decrease of the apnoea-hypopnea index by >50% and below 20 /h), 36 and 22 patients were classified into the success and failure groups, respectively. No differences in baseline characteristics were detected between the groups, except for a higher body mass index in the failure group. In subgroup analysis, the average NN interval and HFnu significantly increased, and LFnu significantly decreased compared to baseline in the success group, while no HRV changes were found in the failure group. **결론:** HRV may be useful for determining MAD therapy efficacy in OSA.

RHTPP-12 08:44~08:48

## CPAP TREATMENT RESULT OF EPIGLOTTIS COLLAPSE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND

**목적:** 후두덮개로 인한 상기도 폐쇄는 CPAP 치료 실패의 중요한 원인 중 하나로 주목 받고 있다. 이에 본 저자들은 후두덮개 폐쇄가 있는 환자들에서 후두덮개로 인한 상기도폐쇄가 양압기 사용 결과에 어떠한 영향을 미치는지 확인해 보았다. **방법:** 2015년 1월부터 2019년 3월까지 수면 호흡 및 코골이를 주소로 본원에 내원한 환자중, 후두덮개 폐쇄를 보인 환자군과 후두덮개 폐쇄가 없는 환자들을 대상으로 나이-성별에 따른 사례 조절연구 (Age-sex matched case control study) 를 시행하였다. 각 환자군을 대상으로 첫 2주 이내 치료실패 여부, 첫 3개월간 치료실패여부 를 조사하였고, 치료 시작 후 2주간 및 치료 시작 후 3개월간의 양압기 사용일수, 4시간 이상 사용일수, CPAP mean pressure, residual AHI 등 CPAP treatment data를 분석하였다. **결과:** 본 연구는 후두덮개로 인한 상기도 폐쇄가 있는 환자군 18명과 이에 대한 age-sex matched 대조군 36명의 data를 분석하였다. 후두덮개폐쇄가 있는 환자 군에서는 18명중 4명이 첫 2주 이내에 CPAP 치료를 중단하였고, 후두덮개 폐쇄가 없는 환자군에서는 36명 중 1명이 첫 2주 이내에 CPAP 치료를 중단하여, 후두덮개폐쇄가 있는 경우 유의미하게 첫 2주 이내 CPAP 치료실패 확률이 높았다. 첫 2주 동안, CPAP 사용기간, CPAP 4시간 이상 사용기간, CPAP mean pressure, residual AHI 는 두 군에서 유의미한 차이를 보이지 않았다. 첫 3개월 동안, CPAP 사용기간은 유의미한 차이를 보이지 않았으나, 4시간 이상 사용기간에서는 후두덮개폐쇄가 없는 군에서 유의미하게 높게 나왔다. 3개월째 순응 탈락자는 후두덮개폐쇄가 있는 군에서 18명 중 10명, 후두덮개 폐쇄가 없는 군에서 36명중 5명으로, 후두덮개폐쇄가 있는 군에서 유의미하게 높았다. **결론:** 후두덮개폐쇄가 있는 경우, CPAP 치료를 적용하였을 때, 후두덮개폐쇄가 없는 환자에 비해 순응 실패 확률이 높은 것으로 판단되었다. 따라서 폐쇄성 수면 무호흡 환자에서 CPAP 치료 전, DISE 를 통해 기도폐쇄부위를 확인하는 것이 필요할 수 있으며, 후두덮개폐쇄가 있을 경우, CPAP 순

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응 실패시 조기에 다른 치료법을 고려해볼 수 있겠다.

**RHTPP-13 08:48~08:52**

### HEMATOLOGIC AND INFLAMMATORY PARAMETERS IN ADULT OSA PATIENTS

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**목적:** There are several studies about laboratory parameters related with OSA and the results are variable and controversial. This study aims to find out the characteristics of laboratory parameters in OSA patients according to the polysomnographic parameters.

**방법:** OSA patients underwent Level I polysomnography (PSG) and blood tests before treatment were enrolled in this study from 2014 to 2018. Patients who were under 18 years-old, diagnosed hematologic disease and chemotherapy, severe cardiovascular disease and underwent OSA operation were excluded. We collected each patient's information such as age, gender, anthropometric data (BMI, waist-to-hip ratio). Also, the PSGs were scored by 2012 AASM scoring rule and collected PSG data (AHI, oxygenation parameters). Also, we collected hematologic and inflammatory data (hemoglobin, neutrophil-to-lymphocyte ratio;NLR, platelet-lymphocyte ratio;PLR, ESR, CRP). **결과:** Total patients were 778 patients were enrolled in this study. The number of patients with severe, moderate and mild OSA was 505, 194 and 79, respectively. The hemoglobin and ESR were significantly higher in severe OSA than in non-severe OSA. Also, we divided groups according to the mean SpO2 and lowest SpO2. In the group of mean SpO2 under 95%, only ESR was significantly higher. In the group of lowest SpO2 under 85%, hemoglobin, NLR and ESR were increased significantly. Also, in these two groups, the percentage of comorbid diseases such

as hypertension and diabetes mellitus was significantly higher. In linear regression analysis, as increasing AHI, hemoglobin, NLR and ESR was significantly increased ( $p=0.016$ ,  $p=0.015$ ,  $p<0.001$ ). **결론:** In this study, hemoglobin, NLR, and ESR showed significance in severe OSA, group of mean SpO2 under 95% and lowest SpO2 under 85%. Therefore, the laboratory parameters may be influenced by severity of OSA in PSG.

**RHTPP-14 08:52~08:56**

### ACOUSTIC ANALYSIS OF SNORING SOUNDS USING SMARTPHONE IN PATIENTS UNDERGOING SEPTOPLASTY: PILOT STUDY

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**목적:** Snoring is a sign of increased upper airway resistance and is most common symptom suggestive of obstructive sleep apnea. Septoplasty is thought to reduce snoring because it reduces upper airway resistance caused by nasal obstruction. There have been a number of studies related to this, but there have been no studies of direct recording of snoring and acoustic analysis. The aim of this study was to determine whether snoring can be changed by septoplasty using acoustic analysis. **방법:** Patients who underwent septoplasty in our hospital due to nasal obstruction. One day before the operation and one month after the operation, snoring during first 1 hour after falling sleep was recorded using a smartphone, acoustically analyzed and compared. **결과:** We could observe the

change of snoring sound of patients with improved nasal congestion by performing septoplasty. **결론:** The septoplasty affected the snoring sound of the patient, and the analysis of the snoring sound before and after surgery using a smartphone may be helpful for personal health care related to snoring in the future.

**RHTPP-15 08:56~09:00**

#### **GINSENOSE RB1 RECOVERY TGF-B1 INDUCED EPITHELIAL-MESENCHYMAL TRANSITION(EMT) IN HUMAN NCI-H292 AIRWAY EPITHELIAL CELLS**

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**목적:** Ginsenoside Rb1 is one of the major active metabolites of ginseng. It is known to have anti-inflammatory, antitumor, and antioxidant properties. Tumor growth factor- $\beta$ 1 (TGF- $\beta$ 1) is associated with the expression of mucin genes and epithelial-mesenchymal transition (EMT). However, the effect of ginsenoside Rb1 on the expression of mucin gene and EMT in airway epithelial cells has not yet been determined. Therefore, we investigated the effect of ginsenoside Rb1 on TGF- $\beta$ 1-induced MUC5AC expression, MUC4 expression, and EMT in human NCI-H292 airway epithelial cells. **방법:** In the mucin-producing human NCI-H292 airway epithelial cells, the effects of ginsenoside Rb1 on the expression of MUC5AC, MUC4, claudin4, claudin18, N-cadherin, E-cadherin were investigated by using reverse transcription-polymerase chain reaction, real-time

polymerase chain reaction, enzyme-linked immunosorbent assay, and Western blot analysis. **결과:** In human airway epithelial NCI-H292 cells, TGF- $\beta$ 1 increased MUC5AC, MUC4, claudin4, and N-cadherin expression significantly. But TGF- $\beta$ 1 decreased claudin18 and E-cadherin expression significantly. Ginsenoside Rb1 inhibited TGF- $\beta$ 1-induced MUC5AC, MUC4, claudin4, N-cadherin expression significantly. But ginsenoside Rb1 increased TGF- $\beta$ 1-reduced Claudin18 and E-cadherin expression significantly. **결론:** These results demonstrated that ginsenoside Rb1 attenuates TGF- $\beta$ 1-induced MUC5AC expression, MUC4 expression, and EMT in human NCI-H292 airway epithelial cells. These findings provide important data regarding the roles of ginsenoside Rb1 in the regulation of mucin secretion and EMT in the human respiratory tract. This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF-2017R1D1A3B03029607).

**RHTPP-16 09:00~09:04**

#### **FIVE CASES OF INFERIOR TURBINATE MUCOCELE AT A SINGLE INSTITUTE**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL & CHONNAM NATIONAL UNIVERSITY HWASUN HOSPITAL

SE HYUN JUNG, DONG HOON LEE, JONG MIN KIM, HEE YOUNG KIM, SUNG MIN JIN, YOUNG YOON KIM, TAE MI YOON, JOON KYOO LEE, SANG CHUL LIM

**목적:** It is extremely rare for the inferior turbinate to occur with a mucocoele. We aim to evaluate the characteristics, clinical features, and treatment outcome of the inferior turbinate mucocoele in our hospital. **방법:** Five patients with radiologically confirmed infe-

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rrior turbinate mucocoele between January 2006 and December 2017 were enrolled in this study. **결과:** Out of the 5 patients with inferior turbinate mucocoele reviewed, two out of the five patients had symptoms of nasal obstruction and headache respectively, while the other three remaining patients were found incidentally by radiological examinations without any nasal symptoms. Four patients were performed the surgery by the transnasal endoscopic marsupialization. One patient had a very small size of an inferior turbinate mucocoele and had no symptoms, and in that case we decided to do a periodic observation without a surgical intervention. There were no major complications resulting from this surgical intervention. **결론:** The inferior turbinate mucocoele is an extremely rare disease and can be diagnosed accurately by the use of radiologic examinations. The prevailing discipline is that endoscopic marsupialization is the best treatment for the inferior turbinate mucocoele, which is known for showing very good results without recurrence of the condition.

**RHTPP-17 09:04~09:08**

#### **LONGITUDINAL MEASUREMENT OF HEALTH -RELATED QUALITY OF LIFE AND OVERALL SURVIVAL AMONG NASOPHARYGEAL CANCER PATIENTS TREATED WITH OR WITHOUT NEOADJUVANT CHEMOTHERAPY IN SABAH, MALAYSIA**

UNIVERSITY MALAYA MEDICAL CENTRE KUALA LUMPUR  
LIEW YEW TOONG

**목적:** To measure HRQOL and overall survival (OS) among newly diagnosed NPC patients in Hospital Queen Elizabeth (HQE), Sabah, Malaysia receiving CCRT with or without prior NACT. **방법:** This is a longitudinal, prospective observational study of 38 newly diagnosed NPC patients from the outpatient ENT clinic in HQE who receive either NACT fol-

lowed by CCRT or CCRT-only treatment depending on severity of disease staging. All patients were interviewed using well- validated HRQOL questionnaire, the FACT-H&N (v4.0) questionnaire before treatment, at 1-month, and 3-months post-treatment. Outcome measures were changes in HRQOL score following treatment, association of demographic or clinical parameters with baseline HRQOL score and 3-year OS. **결과:** NACT followed by CCRT was administered to 25 (65.8%) patients while 13 (34.2%) patients receiving CCRT-only. Firstly, there was no correlation between baseline HRQOL score and demographic or clinical parameters such as severity of disease staging. Patients in both treatment regiments had significant worsening of HRQOL score throughout the treatment. When compared, NACT group did significantly poorly in terms of mean HRQOL score at 3-months post-treatment in all FACT domains. Finally, there was no difference in terms of 3-year OS rate between the 2 different regiments. **결론:** NACT followed by CCRT has greater impact on the worsening of HRQOL among NPC patients as compared to the standard CCRT-only treatment. This information can guide physician and patient in choosing the best management for their disease.

**RHTPP-18 09:08~09:12**

#### **PREVALENCE OF CLINICALLY DIAGNOSED OLFACTORY DYSFUNCTION AND ITS EPIDEMIOLOGY OF SOUTH KOREA: A NATIONWIDE POPULATION-BASED COHORT STUDY**

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, NATIONAL HEALTH INSURANCE SERVICE ILSAN HOSPITAL, <sup>2</sup>RESEARCH AND ANALYSIS TEAM, NATIONAL HEALTH INSURANCE SERVICE ILSAN HOSPITAL

HYO JIN CHUNG<sup>1</sup>, HYUN SEON LIM<sup>2</sup>, KYUIN LEE<sup>1</sup>, TAE SUNG EUH<sup>1</sup>, JUNG HYUN CHANG<sup>1</sup>

**목적:** Olfactory dysfunction, a reduced or complete loss of ability to smell, is getting more attention because of its substantial impact on an individual's quality of life, and the possibility of important sign for the underlying disease. However, olfactory dysfunction is underdiagnosed in the general population for its diagnostic difficulty and unpredictable prognosis. This study aims to evaluate the incidence and prevalence of clinically diagnosed olfactory dysfunction in South Korea by using well-organized nationwide population-based cohort data. **방법:** We investigated the Korean National Health Insurance Service-National Sample Cohort for patients diagnosed with olfactory dysfunction according to International Classification of Diseases. Annual and overall incidence and prevalence during 2003-2013 and characteristics of patients diagnosed with olfactory dysfunction were analyzed. Using recruited patients who later diagnosed neurodegenerative disorder, hazard ratios of sociodemographic factors and comorbidities associated with neurodegenerative disorder were evaluated using Cox proportional hazard regression model. **결과:** A total of 6,296 patients were clinically diagnosed as olfactory dysfunction during study periods (524.67 patients/year). The incidence increased year by year, and was higher in female patients. Patients diagnosed neurodegenerative disorders later during the study periods (n=249) were analyzed to investigate their characteristics as potential risk factors in relation with neurodegenerative disorders. Diabetes mellitus (HR=1.976) and depression (HR=2.758) were significant risk factors in the multivariate Cox model. **결론:** Olfactory dysfunction is an important quality-of-life-related disorder, but still underdiagnosed in South Korea. In clinical practice, we should consider its association with neurodegenerative disorders and possibly more various systemic conditions.

## HNTPP

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08:00~10:00 • 세미나실5

Moderator : 임영창(건국의대), 주영훈(가톨릭의대)

**HNTPP-01 08:00~08:04**

### PREDICTORS OF RECURRENCE AFTER TOTAL THYROIDECTOMY PLUS NECK DISSECTION AND RADIOACTIVE IODINE ABLATION FOR HIGH-RISK PAPILLARY THYROID CARCINOMA

DEPARTMENTS OF <sup>1</sup>OTOLARYNGOLOGY AND <sup>2</sup>PATHOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

YONGHAN KIM<sup>1</sup>, JONG-LYEL ROH<sup>1\*</sup>, DONGEUN SONG<sup>2</sup>, KYUNG-JA CHO<sup>2</sup>, SEUNG-HO CHOI<sup>1</sup>, SOON YUHL NAM<sup>1</sup>, SANG YOON KIM<sup>1</sup>

**목적:** The American Thyroid Association (ATA) proposed the management guidelines for differentiated thyroid cancer including a risk stratification for structural recurrence. This system involves heterogeneous risk factors, of which high-risk requires further evaluation. Therefore, we examined the risk factors for posttreatment recurrence in patients with high-risk papillary thyroid carcinoma (PTC). **방법:** This study included 550 consecutive patients who underwent total thyroidectomy plus neck dissection and radioactive iodine ablation (RAI) for previously untreated high-risk papillary thyroid cancer at department of Otolaryngology in our tertiary referral center. High-risk patients included any findings of gross extrathyroidal extension (ETE), incomplete tumor resection, distant metastases, postoperative serum thyroglobulin (Tg) suggestive of distant metastasis, or lymph nodes (LN) > 3 cm. These and other clinicopathological

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factors were evaluated by univariate and multivariate Cox proportional hazard regression analyses in their associations with recurrence-free survival (RFS). **결과:** Of 550 patients, 419 (76.2%) had gross ETE, 22 (4.0%) had incomplete surgical resection, 32(5.8%) had distant metastasis, 160 (29.1%) had postoperative high Tg levels, and 29 (5.3%) had LNs >3 cm. During follow up of median 92 (65–122) months, 89 (16.2%) patients had recurrence. Gross ETE, high Tg level, and LNs >3 cm were significantly associated with recurrence (all  $P < 0.01$ ). Sex, tumor size, lymphovascular invasion, multifocality, and N1b were also significantly associated with recurrence (all  $P < 0.01$ ). In multivariate analyses, high Tg level, multifocality, and N1b were the independent factors predictive of recurrence (all  $P < 0.05$ ). **결론:** Postoperative high serum Tg level might be the most important predictor of recurrence after total thyroidectomy plus neck dissection and RAI for high-risk PTC

HNTPP-02 08:04~08:08

### SURGICAL OUTCOMES AND EFFICACY OF ISTH-MUSECTOMY IN SINGLE ISTHMIC PAPILLARY THYROID CARCINOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HANYANG UNIVERSITY, COLLEGE OF MEDICINE

HEE WON SEO, SEON MIN JUNG, SEOK HYUN, CHANG MYEON SONG, YONG BAE JI, KYUNG TAE

**목적:** Papillary thyroid carcinoma (PTC) is the most common histologic type of thyroid cancer. The majority of PTC occurs in the thyroid lobes. However, small minority are located in the thyroid isthmus. The optimal surgical extent of isthmic PTC is defined well although total thyroidectomy is usually recommended. The aim of this study was to evaluate the efficacy of isthmusectomy in the surgical treatment of isthmic

PTC. **방법:** We retrospectively studied 117 patients who underwent thyroidectomy with or without central neck dissection (CND) for isthmic PTC from January 2003 to December 2018. We excluded those who were clinically suspected to have cervical lymph node metastasis and gross extrathyroidal extension and have cancers at other site than thyroid isthmus. Patients were divided into three groups according to the extent of thyroidectomy; total thyroidectomy, thyroid lobectomy with isthmusectomy and thyroid isthmusectomy. Clinical and pathologic characteristics, surgical outcomes, and recurrence rate were analyzed. **결과:** Of 117 isthmic PTC patients, 26 patients were men and 91 were women. Total thyroidectomy, thyroid lobectomy with isthmusectomy, and thyroid isthmusectomy was done in 69 (59.0%), 40 (34.2%), and 8 (6.8%) patients, respectively. Prophylactic CND was performed in 99 patients. In a subgroup analysis, patients who underwent total thyroidectomy showed more lymphovascular invasion ( $p=0.020$ ) and higher complication rate of hypoparathyroidism ( $p < .001$ ) than thyroid lobectomy with isthmusectomy group. However, there was no difference in the recurrence rate between the three groups ( $p=0.051$ ). **결론:** Thyroid isthmusectomy might be safe and effective in the surgical treatment of single isthmic PTC.

HNTPP-03 08:08~08:12

### A SPECTROSCOPY-BASED OPTICAL DEVICE FOR DETECTION OF PARATHYROID GLANDS

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YEY-CHAN AHN<sup>2</sup>, HYOUNG SHIN LEE<sup>1,3</sup>, KANG DAE  
LEE<sup>1,3</sup>

**목적:** We had developed a near-infrared parathyroid imaging system through previous studies. However, there was a restriction that the equipment could not be used under a surgical lamp. Probe type spectroscopy-based equipment may be an alternative way to facilitate in routine surgical procedures even under surgical light on. We would like to introduce our new probe type device using phase-sensitive detection, which can be used without interference from the ambient lights. **방법:** To verify the developed equipment, we experimented fluorescent detection with Indocyanine green (ICG) under regular room lights. The signal of fluorescence from ICG was clearly detected but the fluorescent signal was not detected at all in the distilled water used as a control. In clinical situation, four patients were recruited for the experiment of parathyroid detection during thyroidectomy. This developed equipment was used in the actual thyroidectomy. The parathyroid gland was clearly measured as well as ICG. **결과:** The mean measurements of parathyroid and thyroid were 12.9 and 3.9, respectively. The signal intensity of the parathyroid gland was measured to be about 3.3 times stronger than that of the thyroid gland. The results under the regular room lights and the surgical lamp being turned on were not different. **결론:** We have overcome the limitations of previous imaging studies that could not be used under surgical lights on. This spectroscopy-based device is a useful new tool that could be easily used in routine operative situation.

HNTPP-04 08:12~08:16

**RANDOMIZED CONTROL TRIAL COMPARING INCISION AND DRAINAGE TO NEEDLE ASPIRATION IN**

## PERITONSILLAR ABSCESS PATIENTS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND  
NECK SURGERY, WONKWANG UNIVERSITY HOSPITAL,  
WONKWANG UNIVERSITY COLLEGE OF MEDICINE

SEUNG-YOON HAN, DONG-HYUN KIM, MYEONG-  
SIN KANG, DONG-HWAN OH, JAE-HOON LEE,  
YOUNG-JU JIN

**목적:** Peritonsillar abscess is defined as a collection of purulent fluid between the capsule of the palatine tonsil and the pharyngeal muscle. It is most common deep neck space infection in children and adults and is the most frequent indication for hospital admission. The estimated annual incidence in 2013 was 19 per 100,000. The first line treatment is surgical intervention, including aspiration or incision and drainage. This study is to assess the effectiveness and risks of needle aspiration (NA) versus incision and drainage (I&D) for the treatment of peritonsillar abscess. **방법:** From August 2018 to August 2019, 42 patients were admitted for the peritonsillar abscess. Among them, surgical intervention was performed for 37 patients and 5 patients were excluded because patients admitted after surgical intervention in other hospital. Among 37 patients, 19 patients performed I&D and 18 patients performed NA. We analyzed admission period, pain score, WBC, ESR, CRP between two groups prospectively. **결과:** We analyzed 37 patients (Male:25, Female:12) who admitted after drainage of abscess. Mean age was 41.8 ranging from 19 to 64 in I&D and 39.8 ranging from 18 to 67 in NA. Mean admission period was 4.58 in I&D and 5.11 in NA. For the pain score, it was resulted 7.4, 5.7, 3.1, 2.5 in I&D and, 6.8, 6.5, 3.1, 2.6 in NA, respectively at pre-intervention, admission day1, admission day 2, admission day3. Re-drainage was conducted 1 case in both groups respectively. There were no reported complications in both groups. **결론:** NA was very efficient in the aspect of no need for repeated drainage, equivalent descent of VAS score, no fatal events and similar ad-

mission period compare with I&D group.

#### HNTPP-05 08:16~08:20

### THE EFFECTIVENESS OF SURGERY-BASED TREATMENT FOR ADVANCED OROPHARYNGEAL CANCERS

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YOUNG-CHAN KIM<sup>1</sup>, HOYOUNG LEE<sup>2</sup>, KWANG YOON JUNG<sup>3</sup>, SOON-YOUNG KWON<sup>4</sup>, JEONG-SOO WOO<sup>5</sup>, JAE-GU CHO<sup>6</sup>, KYOUNG HO OH<sup>7</sup>, SEUNG-KUK BAEK<sup>8</sup>

**목적:** The excellent survival results of p16-positive oropharyngeal cancer (OPC) have led to down-staging and de-escalation therapy. Therefore, this study aims to investigate the effects of p16 status in selecting treatment in stage III and IV of oropharyngeal cancer.

**방법:** A total of 52 patients with stage III to IV, locally advanced OPC were treated with primary surgery and adjuvant radiotherapy with/without chemotherapy (RT/CCRT) or primary chemoradiation (CRT) between 2010 to 2016. Survival rates were estimated using the Kaplan-Meier method. **결과:** Median follow-up was 41.9 months. Thirty-two and 20 patients received surgery- and RT-based treatments, respectively. Corresponding 5-year survival was 91.2% and 46.8% ( $p < 0.0001$ ). On multivariate analysis adjusting for age, gender, clinical tumor and node stage, treatment modality, and p16-positivity, only surgery-based treatment was associated with a reduced hazard of death ( $p < 0.001$ ). **결론:** Primary surgery-based treatment for advanced OPC has an improved survival compared to primary radiation-based treatment irrespective to p16 positivity.

#### HNTPP-06 08:20~08:24

### POST-TREATMENT 18F-FDG PET/CT FOR PREDICTING SURVIVAL AND RECURRENCE IN PATIENTS WITH HEAD AND NECK CANCER UNDERGOING CURATIVE SURGERY

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<sup>3</sup>DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KING SAUD UNIVERSITY, RIYADH, SAUDI ARABIA  
AH RA JUNG<sup>1</sup>, MANAL BIN-MANIE<sup>1,3</sup>, JONG-LYEL ROH<sup>1\*</sup>, JAE SEUNG KIM<sup>2</sup>, SEUNG-HO CHOI<sup>1</sup>, SOON YUHL NAM<sup>1</sup>, SANG YOON KIM<sup>1</sup>

**목적:** Pre- and post-treatment 18F-FDG PET/CT has been suggested to have prognostic role in human cancers. 18F-FDG PET/CT after primary surgery for head and neck cancer might also predict survival. Therefore, we evaluated the prognostic value of post-treatment 18F-FDG PET/CT in primary surgical patients with head and neck squamous cell carcinoma (HNSCC). **방법:** This prospective study involved 210 patients with previously untreated HNSCC who underwent primary surgery with or without postoperative radiotherapy or chemoradiotherapy. The patients also had 18F-FDG PET/CT scanning within 12 months after surgery. Post-treatment 18F-FDG PET/CT was considered as positive based on interpretation by experienced nuclear medicine physicians with integrating clinical information. Positive and negative predictive values (PPV and NPV) of positive PET/CT in association with recurrence were calculated. Predictors for positive PET/CT were evaluated with binary logistic regression and predictors for survival were evaluated with Cox proportional hazard regression analyses. **결과:** Median follow-up was 64 months. PPV and NPV of post-treatment PET/CT for overall recurrence were 75.0% and 98.6%, respectively. The NPVs for local, regional, and distant metastasis

were 00.0%, 00.0%, and 00.0%, respectively. Positive post-treatment PET/CT was an independent factor predictive of disease-free and overall survivals (both  $P < 0.01$ ): 5-year overall survivals for patients with positive PET/CT was 00.0% compared to 00.0% for patients with negative PET/CT. Perineural invasion, positive resection margin, and extranodal extension were independent predictors of positive PET/CT (all  $P < 0.05$ ). **결론:** Post-treatment PET/CT predicts survival and recurrence in patients undergoing curative surgery for HNSCC.

**HNTPP-07 08:24~08:28**

#### CLINICAL OUTCOME OF SALIVARY GLAND CANCERS IN THE ORAL CAVITY A COMPARATIVE ANALYSIS WITH SQUAMOUS CELL CARCINOMAS OF THE ORAL CAVITY - AN UPDATE ON PATHOLOGY ANALYSIS

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SONG I PARK<sup>1</sup>, WOORI PARK<sup>1</sup>, SUNGYONG CHOI<sup>1</sup>, YUNJEONG JANG<sup>2</sup>, HYUNJIN KIM<sup>2</sup>, SEOK-HYUNG KIM<sup>2</sup>, JAE MYOUNG NOH<sup>3</sup>, MAN KI CHUNG<sup>1</sup>, YOUNG-IK SON<sup>1</sup>, CHUNG-HWAN BAEK<sup>1</sup>, HAN-SIN JEONG<sup>1</sup>

**목적:** Salivary gland cancer (SGC) in the oral cavity is not common and it has been less studied in comparison with oral squamous cell carcinoma (SCC). This study aimed to identify the clinical characteristics and outcomes of SGC in the oral cavity compared with oral SCC. **방법:** The medical charts of the patients who had SGC (N=79) and SCC (N=744) in the oral cavity between 1995 and 2017 were reviewed retrospectively. The clinical and pathological factors and

the outcomes of these patients were analyzed to identify features of oral SGC. To further characterize the difference between SGC and SCC, a comparison was also conducted in tumor size and subsite (propensity score) matched pairs. **결과:** Patients with SGC in the oral cavity survived over 90% in 5 years. Most common pathologies of SGC were mucoepidermoid carcinoma (39.2%) and adenoid cystic carcinoma (34.2%) and high-grade tumors were only 17.7%. Compared with oral SCC, surgery for SGC resulted in less surgical safety margin. However, local control was very successful (nearly 100%) in SGC even with less than 5 mm or positive resection margin through adjuvant radiation treatments. Pathology analysis revealed that the frequency of infiltrative tumor border in oral SGC was significantly lower than that of oral SCC (48.5% vs. 76.5%,  $P=0.0035$ ). **결론:** SGC in the oral cavity represented relatively good prognosis. Adjuvant radiation can be very effective to control minimal residual disease in oral SGC, which has locally less aggressive pathology compared with oral SCC. In addition, we suggested that surgery for oral SGC with less than 5 mm safety margin can be acceptable in selected cases, which requires further validation.

**HNTPP-08 08:28~08:32**

#### TREATMENT OUTCOME OF SCALP ANGIOSARCOMA: A SINGLE INSTITUTE EXPERIENCE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

SUNG SEOK RYU, YOON SE LEE, JONG-LYEL ROH, SEUNG-HO CHOI, SANG YOON KIM, SOON YUHL NAM

**목적:** Scalp angiosarcoma is a rare but aggressive vascular carcinoma. Although it is not frequent, it is quite aggressive, so it is often found in the advanced

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state and tends to cause distant metastasis at an early stage. There is no formal treatment, but wide excision followed by adjuvant therapy is used. Despite these treatments, 5-year survival rates are reported at around 10–50%. The purpose of this study was to analyze the results and progress of scalp angiosarcoma treatment in a single institution. **방법:** From 2011 to 2019, a retrospective study using medical records was performed on patients diagnosed and treated with scalp angiosarcoma at Department of otorhinolaryngology-head and neck surgery, Seoul Asan Medical Center, University of ulsan college of medicine. Patients with distant metastasis at the time of diagnosis or who had previously received radiation or chemotherapy were excluded from this study. The surgical methods, histological findings, recurrence rate, and survival rate were analyzed. **결과:** Total nine patients underwent wide excision and two cases had positive surgical margin. The average tumor size was 8.13 cm and the average depth of invasion was 0.85 cm. There were 2 cases of cervical lymph node metastasis and those cases were all ipsilateral lymph node metastasis. The 1, 2 and 4 year overall survival rates were 66.7%, 16.7% and 0%, respectively. Recurrences were mostly detected at an average of 8.6 months ( $\pm$  6.73) and local recurrences at primary site were the first. Remote metastasis was most commonly found in the lung and liver. On average, it takes 10.4 months ( $\pm$  6.15) of death after recurrence. **결론:** Scalp angiosarcoma had a poor prognosis despite wide resection and postoperative adjuvant therapy. Local recurrences often occur even with sufficient clear resection margin, and distant metastasis occurs after local recurrence. Therefore, it would be better to consult with the patient and caregiver before determine treatment.

HNTPP-09 08:32~08:36

## EFFICACY OF CORE NEEDLE BIOPSY IN THE DIAG-

## NOSIS OF KIKUCHI-FUJIMOTO DISEASE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HANYANG UNIVERSITY SCHOOL OF MEDICINE

SANG GYU PARK, KYUNG RAE KIM, CHUL WON PARK, CHANG MYEON SONG, YONG BAE JI, KYUNG TAE

**목적:** Kikuchi-Fujimoto disease is a self-limited disease that can be resolved spontaneously. It is characterized by cervical lymphadenopathy, fever and other systemic symptoms. It can be misdiagnosed with other disease such as malignant lymphoma and tuberculous lymphadenitis. Therefore, proper diagnosis is necessary to avoid unnecessary treatment. Fine-needle aspiration cytology (FNAC) is a well-established procedure with minimal invasiveness for the diagnosis of kikuchi's disease although it is somewhat limited due to high false-negative results. Core needle biopsy (CNB) might provide better diagnostic results. However, its efficacy is not well determined yet. The aims of this study was to analyze the clinical characteristics and evaluate the efficacy of CNB in the diagnosis of kikuchi's disease. **방법:** One-hundred seventy patients who were diagnosed with kikuchi's disease between January 2009 and May 2019 were included in this study. We retrospectively reviewed the medical record and pathological findings of the patients. **결과:** Of 170 patients, 45 were men and 125 were women. The mean age of patients was  $26.9 \pm 9.12$  years. The most common symptoms were cervical lymphadenopathy (98.8%), followed by fever (68.8%), headache (15.3%) and weight loss (3.5%). Of the 47 patients underwent FNAC initially, 21 patients (44.7%) were diagnosed with kikuchi's disease. Of the 114 patients who underwent CNB initially, 104 patients (95.6%) were diagnosed with kikuchi's disease. All 9 patients who underwent excisional biopsy were diagnosed with the disease. Of 26 patients who were negative in FNAC, 8 were diagnosed with the disease by CNB and 18

were diagnosed with the disease by excisional biopsy. There was no specific complication related to CNB. 5 patients who were negative in CNB were diagnosed with the disease by excisional biopsy. **결론:** Based on the result of this study, CNB is safe and effective in the diagnosis of kikuchi's disease.

#### HNTPP-10 08:36~08:40

### APPLICATION OF COMPREHENSIVE GERIATRIC ASSESSMENT IN ELDERLY PATIENTS WITH HEAD & NECK CANCER

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**목적:** 인구의 고령화로 인하여, 노인환자의 수가 늘어나고 있으며, 노인 환자 에서 두 경부 암의 진단도 늘어나고 있다. 노인환자들은 여러 동반질환, 신체기능 및 인지 기능 저하 등을 가질 확률이 높기 때문에 치료 중 합병증의 발생빈도가 높아 치료 중 주의를 요한다. 이 연구에서는, 치료 전 노인포괄평가를 시행하고 이 결과에 따라 치료 중 발생하는 합병증을 예측 할 수 있는지를 평가 하였다. **방법:** 분당서울대병원에서 두경부암으로 진단 받고 치료를 시행한 70세이상 환자 들의 의무 기록을 검토 하였다. 이 환자들에서 치료 중 발생한 합병증과, 노인포괄평가 의 결과를 비교 하였다. **결과:** 연구 대상 환자들은 총 47명 이었다. 수술 및 수술 후 항암, 방사선 치료를 받은 환자가 24명(51%), 수술 없이 항암, 방사선 치료를 받은 환자가 23명(49%)있었다. 그 중 합병증이 있는 경우는 16명 (34%)이 있었으며, 합병증은 정신과적 질환, 호흡기계 합병증, 전신쇠약 및 경구 섭취 섭취 제한으로 입원치료가 필요한 환 자로 3 가지 그룹으로 나눌 수 있었다. 방사선 치료 중 원인 모를 사망한 경우 도 1명이 있었다. 환자 군을 기저 질환

(charlson's comorbidity index), 인지기능평가(MMSE-KC), 영양 평가(Minimal nutritional assessment)에 따라서 나누어 보았을 때 에는, 합병증의 발생 빈도에 큰 차이는 없었다. 하지만 환자 군을 운동능력(걸음 속도, 악력), 일상생활 능력(ADL & IADL) 로 나누어 비교 하였을 때에는, 운동 능력 및 일상생활 능력의 결과가 안 좋은 환자 군에서 합병증의 빈도가 증가 하는 경향이 있었다. (걸음 속도 : 0.8m/s 이상 vs 0.8m/s 이하, 25.8% vs 50.0%, p-value : 0.097), (악력 20kg 이상 vs 20kg 미만, 26.5% vs 53.8%, p-value : 0.076), (ADL 100점 vs 100점 미만, 31% vs 60%, p-value : 0.195) (IADL 5점 vs 5점 미만, 28.2% vs 63.5%, P-value : 0.062) **결론:** 분당 서울대병원에서 치료를 받은 70세 이상 두경부 암 환자들에 대하여 알 아 보 았고, 그 환자 들에서 합병증의 발생 빈도를 살펴 보았다.

#### HNTPP-11 08:40~08:44

### SURGICAL MANAGEMENT OF PARAPHARYNGEAL SPACE TUMORS: A SINGLE-INSTITUTION COMPARATIVE STUDY OF ROBOTIC VERSUS CONVENTIONAL SURGERY

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**목적:** To compare and evaluate surgical outcomes of parapharyngeal(PPS) tumor patients who underwent robotic surgery to conventional surgical treatment. **방법:** A single institutional, retrospective, comparative, interventional cohort study. 136 patients who underwent surgical removal of PPS tumors via conventional or robotic approaches. **결과:** Conventional surgical techniques were performed in 83 patients, which included, transcervical (TC) approach in 43 patients,

transcervical-parotid (TCP) 29, transmandibular (TM) or infratemporal fossa (ITF) in 29, and transoral (TO) in 7. Robotic surgical approaches were administered to 53 patients, which included: TO in 26 patients, transoral-transcervical (TOC) in 16, and retroauricular (RA) in 11. We identified PPS tumors in prestyloid and poststyloid regions in 87 (64%) and 49 (36%) patients, respectively. There were 48 (35.3%) pleomorphic adenomas, 36 (26.5%) schwannomas, and 24 (17.6%) paragangliomas. Robotic surgery resulted in lesser estimated blood loss during poststyloid PPS tumor surgery; however, it resulted in delayed mean postoperative feeding and hospital stay after treating prestyloid PPS tumors than in the conventional surgery group. We noted perioperative complications in 53 patients (38%). Lower incidence of permanent facial paralysis was reported in robotic surgery (0%) of prestyloid PPS tumors than in the latter (15.2%). Intraoperative tumor spillage of pleomorphic adenoma showed no significant differences between the two groups (14.8% in robotic vs. 12% in conventional surgery). Mean follow-up time was  $4.9 \pm 3.4$  years, and recurrence were observed in two patients during follow-up without a significant difference between the two groups (3.7% in robotic vs. 4% in conventional). **결론:** Robotic surgery minimizes surgical morbidity and provides treatment outcomes comparable to conventional open surgery. A large scaled multi-institutional study is necessary to verify our results and determine a surgical approach ideal for removing PPS tumors.

**HNTPP-12 08:44~08:48**

### IMMUNE PROFILES OF PATIENTS WITH HEAD AND NECK CANCER UNDERGOING INDUCTION CHEMOTHERAPY: A PRELIMINARY STUDY

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AH RA JUNG, YOON SE LEE\*, JONG-LYEL ROH, JAE SEUNG-HO CHOI, SOON YUHL NAM, SANG YOON KIM

**목적:** This study assessed clinical significance of CD8+ T-cell infiltration gene signatures the prognosis in patients with head and neck squamous cell carcinoma (HNSCC) undergoing induction chemotherapy. And this study showed the association of CD8+ T-cell infiltration gene signature with immune checkpoint inhibitor. **방법:** We analyzed data on 40 patients who underwent induction chemotherapy for HNSCC from the TCGA cohort. Patients with HNSCC were classified into two subgroups with high or low CD8+ T-cell infiltration (Cluster1, Cluster2, respectively), according to a well-established CD8+ T-cell infiltration chemokine signature. The association of subgroups with several immunotherapy related score were analyzed. **결과:** Hierarchical clustering analysis of the gene expression data from the TCGA cohort (n = 40) revealed two distinct subgroups of HNSCC: the high CD8+ T-cell infiltration subgroup (Cluster1, n = 19) and low CD8+ T-cell infiltration subgroup (Cluster2, n = 21). The Cluster2 subgroup showed worse prognosis than the Cluster1 subgroup. The results were not statistically significantly associated with overall survival and recurrence-free survival. The Interferon-gamma score and cytolytic activity score were significantly elevated in Cluster1 as compared with the Cluster2 subgroups. PD-1, and PD-L1, were significantly elevated in the Cluster1. **결론:** Immune score or T-cell activity-related genes in HNSCC would be another classification system. This system can be used to predict response to neoadjuvant immune checkpoint inhibitors for HNSCC

HNTTP-13 08:48~08:52

**MICRORNA-129-5P SUPPRESSES THE TUMOR PROGRESSION BY TARGETING SOX4 IN HEAD AND NECK SQUAMOUS CELL CARCINOMA**

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EUN KYUNG JUNG, SUN AE KIM, DONG HOON LEE, JOON KYOO LEE, SANG CHUL LIM, TAE MI YOON

**목적:** In humans, sex-determining region-Y (SRY) related high-mobility-group box 4 (SOX4) is linked to development and tumorigenesis. SOX4 is over-expressed in several cancers and has prognostic significance. And microRNA-129-5p (miR-129-5p) was reported to be down regulated in human cancer. However, the association of miR-129-5p and SOX4 in head and neck squamous cell carcinoma (HNSCC) has not been sufficiently studied. This study evaluated whether miRNA-129-5p and SOX4 affects oncogenic behavior and chemoradiotherapy response in HNSCC cells, and documented the relationship between miRNA-129-5p and SOX4 in HNSCC cells.

**방법:** RT-PCR, qRT-PCR, Westernblot, cell viability assay, cell apoptosis assay, cell invasion and migration assays was used. **결과:** SOX4 protein and mRNA expression was significantly increased in HNSCC tissues compared with adjacent tissues. In the contrary, miRNA-129-5p was decreased in HNSCC tissues compared with adjacent tissues. Moreover, we found that overexpression of miRNA-129-5p inhibited mRNA and protein expression of SOX4 in HNSCC SNU 1041 cells. SOX4 knockdown by siRNA, decreased cell viability and induced apoptosis by activating caspases-3 and -7, and poly-ADP ribose polymerase and suppressing X-linked inhibitor of apoptosis protein in SNU1041 cells; it also enhanced radiation/cisplatin-induced apoptosis; and suppressed tumor cell invasion and migration. Overexpression of miRNA-

129-5p was accompanied by the suppression of cell viability, invasion, and migration and the induction of apoptosis and radiation/cisplatin-induced apoptosis in SNU1041 cells, similarly to the SOX knockdown. **결론:** Our study provides evidence that miR-129-5p acts as a suppressor of tumor progression by targeting SOX4 in HNSCC.

HNTTP-14 08:52~08:56

**ANALYSIS OF CLINICO-PATHOLOGIC AND IMMUNOLOGIC FACTORS RELATED TO BRAF MUTATION IN PAPILLARY THYROID CARCINOMA**<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, <sup>2</sup>RESEARCH CENTER, <sup>3</sup>DEPARTMENT OF PATHOLOGY, DONGNAM INSTITUTE OF RADIOLOGICAL AND MEDICAL SCIENCESSOO-YOUN AN<sup>1</sup>, HONG-RAE LEE<sup>2</sup>, CHEOL-HUN SON<sup>2</sup>, SOOYOUNG CHUNG<sup>3</sup>

**목적:** To evaluate the relationship between BRAF(V600E) mutation and clinico-immunological parameters in papillary thyroid carcinoma(PTC) and finally to study the tumor immune evasion via BRAF-MAPK signaling pathway. **방법:** We performed retrospective chart review about 218 PTC patients who were undergone total thyroidectomy as their first surgery at our institute (DIRAMS) between January 2013 and March 2014. The relationship between BRAF(V600E) mutation and clinico-histological parameters, such as age, sex, stage, extrathyroidal invasion, LN metastasis, extranodal invasion, LN ratio was statistically analyzed. Immunohistochemical staining for T regulatory cell, CTLA-4, PD-1 and PD-L1 were performed via microarray method. CD4+CD25+FoxP3+ T regulatory cell was quantified through flow cytometry. **결과:** There were no significant clinico-histological factors related to BRAF(V600E) mutation in 191 PTC patients. Immu-

nohistochemical stain for immunologic parameters somewhat failed due to nonspecific stain for FoxP3 and CTLA-4. No expression was observed for PD-1. It showed different degree of expression of PD-L1 at each patient. The frequency of CD4+CD25+FoxP3+ T regulatory cell was increased in tumor tissue compared to in normal tissue (23.67% vs 5.19%). **결론:** We could not find any significant clinico-histological factors related to BRAF mutation in PTC. Although there was no PTC tissue showing PD-1 expression, PD-L1 on tumor cells was well expressed. More study is needed for PD-L1 expression and CD4+CD25+FoxP3+ T regulatory cell related to BRAF mutation.

**HNTTP-15 08:56~09:00**

#### **RISK FACTORS FOR METASTASIS AND SURVIVAL OF HEAD AND NECK ADENOID CYSTIC CARCINOMA**

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**목적:** Adenoid cystic carcinoma (AdCC) generally shows a slow growing but highly metastatic potential to distant organ sites. Several factors and biomarkers related to its metastasis and treatment outcome have been proposed, which needs to be further defined. Therefore, this study aimed to evaluate the risk factors for metastasis and survival of patients with AdCC of the head and neck. **방법:** This study involved 101 patients with previously untreated AdCC who underwent primary surgery with or without radiotherapy or chemoradiotherapy in our tertiary referral center. The end-points of this study were distant metastasis and

survival. Univariate and multivariate Cox proportional hazard regression analyses were used to find the risk factors associated with overall survival (OS), disease-specific survival (DSS), progression-free survival (PFS), and distant metastasis-free survival (DMFS). **결과:** During follow-up of median 88 months (28-166 months) after treatment, 39 patients had distant metastasis and 32 patients died of diseases. Univariate analyses showed that tumor size (>4 cm), high histological grade, T3-T4 classification, nodal positivity, advanced overall III - IV stage, and initial M1 were significantly associated with all of OS, DSS, PFS, and DMFS (all P <0.05). Extracapsular extension was associated with PFS and lymphovascular invasion was associated with DMFS (P <0.05). Multivariate analyses showed the tumor size and histological grade were the independent factors of PFS and DMFS, and initial M1 was the independent factor of OS and DSS (all P <0.05). **결론:** Several clinic-pathological factors can predict metastasis, progression, and patient survival of AdCC. This may promote post-treatment surveillance in the AdCC patients.

**HNTTP-16 09:00~09:04**

#### **CORRELATION BETWEEN VOICE OUTCOME AND VIBRATORY PATTERN OF VOCAL FOLD AFTER INJECTION LARYNGOPLASTY FOR UNILATERAL VOCAL FOLD PARALYSIS**

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GO-EUN JEONG, DAM HEE LEE, DAE SEONG AHN, JONG-LYEL ROH, SEUNG-HO CHOI, YOON SE LEE, SANG YOON KIM, SOON YUHL NAM

**목적:** 성문의 틈이 있는 일측성 성대 마비에 대한 치료로 성대내 주입술을 시행하고 있다. 시술시 성문부 틈을 줄이기 위해 주입물질을 주사하여도 시술 후 음성



의 질의 개선정도에 차이를 보이는 경우가 있다. 원인으로서는 부족한 주 입 및 조기 흡수, 표면의 주입, 성문부의 수직위상의 차이 등이 있다. 성문 부의 진동 패턴 또한 주입술의 결과에 영향을 줄 수 있는데 아직까지 진동 패턴을 분석한 연구가 많지 않다. 이에 저자들은 성대내 주입술을 시행한 뒤 주관적 증상, 음성 검사결과와 진동패턴의 상관관계를 분석하고자 하였다. **방법:** 2019 4월부터 2019년 7월까지 본원에서 성대내 주입술을 시행한 환자를 대상으로 연구를 진행하였다. 환자는 14명(남:12,여:2)으로 모두 HA injection을 시행하였으며 주입량은 0.8cc~1.8cc로 평균 1.0cc를 주입하였다. 성대주입술을 시행 후 1개월 후에 평가하였으며, 음성에 대한 청지각적 검사(GRBAS), 음향학적 검사(jitter, shimmer, NHR), 2D VKG(ASI, PSI), voice handicap index (VHI)의 상관관계를 분석하였다. **결과:** 일측성 성대마비환자의 성대주입술 후 청지각적 평가결과 G척도 1.4, R척도 0.7, B척도 1.2, A척도 0.53, S척도 0.2를 보였다. 음향학적 평가결과는 jitter 4.3, shimmer 7.5, NHR 0.2를 나타냈다. VHI의 총점은 66.7점, VHI grade는 6.42였으며, 2D VKG의 ASI는 0.02, PSI는 -0.01의 결과를 보였다. 상관관계 분석결과, 2D VKG의ASI는 청지각적, 음향학적 검사와 상관관은 없었으나, PSI의 경우에는 VHI의 총점 및 VHI의 grade와 상관도가 높았다. VHI의 경우, 청지각적 평가의 G,B,A척도, 음향학적 평가의 jitter, NHR과 상관성이 높았으며 성대진동의 phase symmetry도 상관성이 높다는 결과를 보였다. phase symmetry가 좋을수록 음성에 대한 만족도가 높다는 결과를 보였다. **결론:** 성대의 진동 평가를 통해서 성대 마비에 대한 성대내 주입술의 만족도를 예측할 수 있다. 이들 중에서 phase symmetry가 음성에 대한 만족도를 예측할 수 있는 지표로 사용할 수 있을 것이다.

HNTTP-17 09:04~09:08

## EFFECTS OF VOICE IMPROVEMENT ON ON-LINE AND OFF-LINE VOICE THERAPY PROGRAMS USING SMARTPHONES

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**목적:** 음성치료는 환자의 음성산출행동을 변화시키는 것으로 환자의 꾸준한 연습과 이를 일상생활에서 접목시키는 것이 중요하다. 온·오프라인 음성치료 프로그램은 가정에서 스마트폰을 활용한 자가 음성훈련과 병원에서 치료사와 함께 실시하는 오프라인 음성치료 프로그램으로 구성되어 있다. 본 연구에서는 온·오프라인 음성치료 프로그램이 기존 전통적인 면대면 음성치료와 비교해 음성 개선에 효과적인지 알아보려고 하였다. **방법:** 연구대상은 후두스트로보스코피, 음성 검사상 음성장애로 진단된 환자 30명을 대상으로 실시하였다. 실험군(남성 6명, 여성 9명)은 병원에서 실시하는 오프라인 음성치료 주 1회와 가정에서 스마트폰을 활용하여 실시하는 온라인 음성치료를 주 1회, 총 2회 실시하였다. 대조군(남성 6명, 여성 9명)은 병원에서 오프라인 음성치료를 주 1회 실시하였다. 평균 치료 회기는 실험군 4.4(0.7)회, 대조군은 5.3(1.5)회였다. 평균 연령은 실험군은 37.3(11.4)세, 대조군은 39.9(10.84)세였다. 음성평가는 음향학적 음성 평가, 공기역학적 음성평가를 통해 치료 후 음성 개선 정도를 측정하였다. 실험은 사전 평가 단계, 중재 단계, 사후 평가 단계로 실시하였다. **결과:** 온·오프라인 음성치료 프로그램을 실시한 실험군에서는 MDVP 결과 Jitter, Shimmer에서 유의미하게 감소되었다( $P<0.1$ ,  $P<0.01$ ). VRP 결과 Fo range(semi-tone)에서 유의미한 증가가 있었다. ( $P<0.001$ ). PAS 결과 PHOT, MEAF( $P<0.001$ )에서 유의미한 개선이 있었다. 오프라인 음성치료 프로그램을 실시한 대조군에서는 MDVP 결과 Jitter, Shimmer에서 유의한 차이가 없었다 ( $P<0.01$ ,  $P<0.1$ ). 반면 VRP와 PAS 결과 유의미한 차이가 없었다. **결론:** 온·오프라인 음성치료 프로그램은 음성장애 환자의 음향학적, 공기역학적 음성 개선에 효과적인 것으로 나타났다. 향후 연구에서는 다양한 음성장애 유형에 따라 음성 개선 효과에 차이가 있는 지 알아볼 필요가 있다. 또한 온라인과 오프라인 음성치료

18월 (금)

본과 및 유관학회 포스터

Education Program

이과 구연 (OTOP)

비과 구연 (RHOP)

두경부 구연 (HNOP)

TTP

프로그램의 효과적인 중재 횟수와 적용 시기에 대한 연구가 필요할 것으로 사료된다.

HNTPP-18 09:08~09:12

## THE EFFECT OF STEROID THERAPY FOR IDIOPATHIC UNILATERAL VOCAL CORD PALSY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KYUNGPOOK NATIONAL UNIVERSITY SCHOOL OF MEDICINE

JONGWON BAE, GILJOON LEE

**목적:** Idiopathic unilateral vocal fold paralysis(IVFP) is believed to be due to inflammation and edema of the recurrent laryngeal nerve caused by viral diseases such as upper respiratory tract infections. Corticosteroid has a potent anti-inflammatory action which should minimize nerve damage. The purpose of this study was to investigate the effect of oral steroid therapy on IVFP. **방법:** Idiopathic unilateral vocal fold paralysis(IVFP) is believed to be due to inflammation and edema of the recurrent laryngeal nerve caused by viral diseases such as upper respiratory tract infections. Corticosteroid has a potent anti-inflammatory action which should minimize nerve damage. The purpose of this study was to investigate the effect of oral steroid therapy on IVFP. **결과:** Thirty-seven patients were enrolled in this study. There was no relationship between oral steroid use, dosage and recovery of vocal cord paralysis. Oral steroids showed a rapid recovery of vocal cord paralysis, but there was no statistically significant difference in the time of recovery of vocal palsy with or without steroids. In addition, there was no statistically significant difference in recovery rate between the period to start of treatment, presence of diabetes mellitus, and treatment modality, but the recovery rate was high in the group with upper respiratory tract infection history. **결론:** In IVFP, oral steroid therapy has no significant difference in time and ex-

tent of recovery compared to the case of spontaneous recovery.

HNTPP-19 09:12~09:16

## EFFICACY OF LAUGHING VOICE TREATMENT IN PATIENTS WITH UNILATERAL VOCAL FOLD PARALYSIS

<sup>1</sup>YEOLLIN ENT CLINIC, <sup>2</sup>DEPARTMENT OF SPEECH-LANGUAGE PATHOLOGY, DONGSHIN UNIVERSITY

SOYEON HWANG<sup>1</sup>, HANKOOK LEE<sup>1</sup>, SEONG-TAE KIM<sup>2</sup>

**목적:** Unilateral vocal fold paralysis(UVFP) has various symptoms such as dysphagia due to velopharyngeal insufficiency, breathy voice, low intensity, diplophonia, and voice fatigue. Voice therapy is necessary to improve voice quality, but there are no standardized treatments yet. The aim of this study was to evaluate the changes in the treatment of unilateral vocal fold paralysis using SKLCT® (Seong-Tae Kim's laryngeal calibration technique). **방법:** The subjects were 15 female patients who were diagnosed with unilateral vocal fold paralysis. The ages ranged from 19 to 64 years, average of 45.2 years. All subjects underwent voice therapy using SKLCT®, which was designed using laughter, and the number of treatments were 3 ~ 28 sessions, average 13.9 sessions. To compare the laryngeal findings before and after the treatment, videostroboscopy was performed, and the perceptual and acoustic evaluations were performed to compare the changes of vocal parameters. **결과:** After SKLCT®, the glottal gap and supraglottic compression findings were significantly reduced compared to before this treatment. rough and breathy voices were decreased after treatment, and acoustic evaluations showed that jitter, shimmer, NHR, vFo, vAm, and PFR were significantly decreased than before treatment( $p < .05$ ). In contrast, MPT was significantly increased, and

the narrow VRP ranges were statistically significantly expanded after SKLCT®. **결론:** SKLCT® has been shown to be a very effective treatment for voice improvement in patients with unilateral vocal fold paralysis. In the future, it is expected to be useful for voice therapy of patients with other neurogenic voice disorders or hyperfunctional voice disorders showing glottic gap.

**HNTPP-20 09:16~09:20**

### RISK FACTORS FOR PREDICTION OF RECURRENCE IN EARLY GLOTTIC CANCER

DEPARTMENT OF OTORHINOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE, SEOUL, KOREA

CHOL-HO SHIN, AHRA JUNG, YONGHAN KIM, YOON-SE LEE, JONG-LYEL ROH, SEUNG-HO CHOI, SANG-YOON KIM, SOONYUHL NAM

**목적:** Early glottic cancer is glottic cancer with T stage one or two without nodal or distant metastasis and has good prognosis compared to other head and neck cancer. However in recurred cases early prediction is mandatory for maintaining its good prognosis. We aimed to newly introduce factors for predicting recurrence. **방법:** From 2013 to 2017, patients who admitted for the work up of biopsy proven early glottic squamous cell carcinoma were enrolled. Patients with early follow up lost less than one year, recurred disease at initial presentation, pathologic type other than squamous cell carcinoma were excluded. Variable clinical characteristics including quantified pre-treatment voice of study group using computerized speech lab (CSL) were listed and analyzed using cox proportional hazard model for the calculation of hazard ratio with univariate and multivariate analysis. CSL data included grade, roughness, breathiness, asthenia, strain, aphonia, fundamental frequency, speaking funda-

mental frequency, jitter, shimmer, noise-to-harmonics ratio, maximum phonation time. **결과:** Total 50 patients were enrolled. Average age was 66.8 years-old. 47 patients were male the other 3 patients were female. 41 patients had experience of smoking and 40 patients with that of alcohol consumption. Average smoking pack-year was 21.39. As the primary treatment 19 people underwent surgery alone, 26 patients underwent radiotherapy alone and the other 2 patients underwent surgery with postoperative radiotherapy. Clinical manifestation, voice laboratory findings, differentiation, tumor extent, treatment modality did not affect the recurrence rate. ( $p>0.05$ ) **결론:** Our findings could not suggest clinical manifestation voice state of voice as the reliable recurrence factor.

**HNTPP-21 09:20~09:24**

### CLINICAL MANIFESTATIONS OF LARYNGEAL TUBERCULOSIS OF 27 CASES

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY COLLEGE OF MEDICINE, <sup>3</sup>HANA ENT HOSPITAL, <sup>4</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE<sup>4</sup>  
HYUN JONG JEON<sup>1</sup>, JI HOON KIM<sup>1</sup>, JAE-YOL LIM<sup>2</sup>, HONG-SHIK CHOI<sup>3</sup>, HYUNG KWON BYEON<sup>4</sup>

**목적:** The purpose of this study is to analyze the changing trends in the incidence and clinical characteristics of laryngeal tuberculosis. **방법:** A total of 27 patients that were initially diagnosed with laryngeal tuberculosis between 2005 and 2018 were retrospectively analyzed at tertiary medical center. **결과:** The primary symptoms include hoarseness (92.9%), cough (50%) and sore throat (25%), but systemic symptoms were rare in this study population. In the majority of cases, laryngeal tuberculosis was not associated with

Withdrawal

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pulmonary tuberculosis (67.2%). The age of the patients ranged from 25 to 95 with an average age of 45 years. There were 12 males and 15 females. Laryngoscopy examination were summarized into 4 types: polypoid type (10 cases), nonspecific (7 cases), granulomatous type (6 cases), ulcerative type (4 cases). True vocal cord area was most common involves site in the laryngeal cavity. All of patients were recovered by medication within 15 months. **결론:** Tuberculosis has become a rare disease but laryngologists always be ready for the possibility of primary laryngeal tuberculosis with hoarseness and atypical laryngeal findings and should recognize the recent changes in clinical patterns of this disease.

## Video session 안내

### 10월 17일 목요일~18일 금요일

#### [이과 Video session]

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

엑스포홀 로비

STAPEDOTOMY USING SKEETER DRILL OR LASER

박시내(가톨릭의대)

TRANSLABYRINTHINE APPROACH A BEGINNERS GUIDE

손은진(연세의대)

REMOVAL AND RECONSTRUCTION OF ATTIC  
CHOLESTEATOMA

정종우(울산의대)

COMPARISON OF THE PROS AND CONS BETWEEN  
MIDDLE FOSSA AND RETROSIGMOID APPROACH IN  
MICROSURGERY OF ACOUSTIC TUMOR

장기홍(가톨릭의대)

#### [비과 Video session]

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

엑스포홀 로비

CORRECTIVE RHINOPLASTY USING EXTRACORPOREAL  
SEPTOPLASTY TECHNIQUE

심우섭(충북의대)

SEPTAL CARTILAGE TRACTION SUTURE TECHNIQUE FOR  
CAUDAL SEPTOPLASTY

조규섭(부산의대)

TONGUE BASE SURGERY IN OBSTRUCTIVE SLEEP APNEA

김현직(서울의대)

Video Session은 엑스포홀 2층 로비에 설치된 컴퓨터에서  
재생하여 보실 수 있습니다.

#### [두경부 Video session]

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

엑스포홀 로비

FUNCTIONAL IMAGING FOR EVALUATION OF VOCAL  
FOLDS VIBRATION

왕수건, 이진춘, 이연우(부산의대)

PULL-THROUGH RESECTION IN ADVANCED TONGUE  
CANCER

백승국(고려의대)

DIVERSE MICROSURGICAL TECHNIQUES IN HEAD AND  
NECK RECONSTRUCTION

정만기(성균관의대)

RECONSTRUCTION OF THE DEFECTS AFTER TRANSORAL  
RESECTION OF TONSILLAR CANCER

김민식(가톨릭의대)

PAROTIDECTOMY A TO Z

홍현준(가톨릭관동의대)

## 이과 Video session

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

• 엑스포홀 로비

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

### STAPEDOTOMY USING SKEETER DRILL OR LASER

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA

SHI NAE PARK

Stapedotomy는 이경화증(otosclerosis), 선천성 등골 고정증(congenital stapedial fixation), 고실 경화증(tympanosclerosis)로 인한 등골 족판의 고정 등으로 인해 발생하는 전음성 난청을 교정하기 위해 시행하는 수술 술기이다. Transmeatal approach, endoaural approach 또는 postauricular approach를 통해 중이를 노출시키고, 고실외이도 피판(tympanomeatal flap)을 들어올린다. 이때 적절하고 수월한 stapedotomy 수술을 위해 추골의 단돌기(lateral process)와 handle을 앞쪽 경계로 하고 큐렛 또는 드릴을 이용하여 뒤쪽으로는 pyramidal eminence가 보일 때까지 posterior atticotomy를 시행하고, 위쪽으로는 안면신경관이 보이고, 아래로는 정원창이 잘 보일 정도의 시야를 확보하는 것이 중요하다. Chorda tympani nerve는 들추어진 피판에 최대한 붙여 두고 충분한 시야가 확보되면 먼저 이소골의 움직임을 관찰하여 등골고정 상태를 확인한다. 진단이 확실하면, incudostapedial joint를 분리한 후 malleus와 incus의 움직임을 확인하고, 고정된 등골의 상태를 다시한번 점검한 후 stapes tendon을 microscissors나 LASER로 자르고, crurotomy scissors, drill 혹은 LASER를 이용하여 등골의 posterior crus를 절제한다. 등골의 Anterior crus는 상대적으로 얇고 약하기 때문

에 pick을 이용하여 가볍게 앞으로 밀면 대체로 잘 절제되지만 충분히 고정되지 않은 등골 족판을 지닌 환자에게는 등골 족판의 골절, subluxation등을 방지하기 위해 LASER를 활용한 anterior crurotomy가 권장된다. Crurotomy가 문제 없이 끝나면 등골의 suprastructure를 제거한다. 경우에 따라 I-S joint분리를 crurotomy 이후에 하기도 한다. Incudostapedotomy의 경우 등골 족판에서 침골의 내면까지 길이를 caliper로 재고, 침골의 기형, 이형성, 고정 등으로 인해 malleostapedotomy를 계획할 경우 등골에서 추골병(manubrium or handle)이나 추골경부(neck)의 내면까지의 길이를 측정하게 된다. 일 반적으로 incudostapedotomy의 경우 4.25~4.75mm 길이의 piston wire를 사용하게 되면, malleostapedotomy의 경우 추골에서 등골간의 거리가 길어 이식물의 길이를 5mm 이상 재단해야 하는 경우가 많다. 피스톤 고리의 위치를 결정하는 것은 등골 족판에서 추골병이나 추골경부까지의 각도가 매우 중요하며, 필요시에는 피스톤 고리를 전방으로 구부려 연결하기도 한다. Piston wire를 선택한 후 등골 족판에 skeeter drill이나 LASER를 이용하여 구멍을 뚫고 피스톤을 sharp pick, blunt hook등을 이용하여 등골 족판창에 맞게 삽입한 뒤에 피스톤 고리를 crimper를 이용하여 단단히 crimping 한다. 족판창의 외림프액의 유출을 막기 위하여 ear lobule 또는 외이도에서 얻은 지방조직과 fibrin glue 등으로 보강하고 피판을 내려 외이도 패킹 후 수술을 마친다. 저자가 15년이상 사용하고 있는 등골 절제술의 방법과 수술 과정에서 터득한 주의 사항을 수술 방법에 따라 나누어 비디오를 통해 설명하고자 하며, 최근까지 저자가 시행한 65예 이상의 Stapedotomy에 대한 치료 성적 분석 결과와 수술 전, 후의 주의 사항 및 추적관찰 결과를 소개하고자 한다.

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

### TRANSLABYRINTHINE APPROACH A BEGINNERS GUIDE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY YONSEI UNIVERSITY COLLEGE OF MEDICINE GANGNAM SEVERANCE HOSPITAL

## EUN JIN SON

Unique anatomy of the temporal bone offers both a fascinating interest and surgical challenge for both neurosurgeons and otologists. The temporal bone is comprised of squamous, tympanic, mastoid, and petrous regions. The mastoid portion articulates with the parietal and occipital bones and harbors the mastoid air cell systems. The petrous apex of the temporal bone encases the otic capsule including the cochlear, vestibular organs and internal auditory canal. Transtemporal approach has the advantage of allowing access to the facial nerve, internal carotid artery, jugular bulb, labyrinth, internal auditory canal (IAC), and petrous apex within the temporal bone, and offers extended surgical field to the petroclival regions. Depending the extent of the disease that needs to be eradicated, a wide range of mastoid procedures can be utilized: from simple mastoidectomy to only remove the disease limited to the antrum (the largest air cell in the mastoid system), canal wall up/down mastoidectomy (with reference to preservation/ removal of the posterior external auditory canal wall), radical mastoidectomy (complete removal of the mastoid air cells, exteriorization of the middle cavity with e-tube obliteration), modified radical mastoidectomy (similar to canal wall down mastoidectomy and epitympanotomy), mastoid obliteration, retrolabyrinthine approach (otic capsule is preserved and retrolabyrinthine air cells and posterior fossa dural plate are removed), translabyrinthine (removal of the bony labyrinth with preservation of the cochlear duct), transcochlear (removal of the cochlear duct) to transotic (removal of both vestibular and cochlear organs) approaches. In order to gain adequate access for tumor removal and preservation of facial and cochleovestibular nerve functions, the importance of basic technique of “complete” mastoidectomy cannot be overemphasized. In this video lecture, intratemporal landmarks from the lateral to medial approach to the petrous apex are

described and surgical techniques essential to ensure adequate exposure of the IAC and preservation of the facial nerve function are explained.

**17일(목) 10:30~16:50, 18일(금) 08:00~15:10**

### REMOVAL AND RECONSTRUCTION OF ATTIC CHOLESTEATOMA

DEPARTMENT OF OTORHINOLARYNGOLOGY, ASAN MEDICAL CENTER, UNIVERSITY OF ULSAN COLLEGE OF MEDICINE

JONG WOO CHUNG

Cholesteatoma in attic area is usually spread superiorly and posteriorly. In order to remove the cholesteatoma safely, a transmastoid posterior approach is generally accepted. Recently, the development of endoscopic technologies enable the removal of cholesteatoma through transcanal approach in a limited cases. In this video, I will present the surgical technique to remove the attic bone and cholesteatoma, and reconstruct the area with cartilage.

**17일(목) 10:30~16:50, 18일(금) 08:00~15:10**

### COMPARISON OF THE PROS AND CONS BETWEEN MIDDLE FOSSA AND RETROSIGMOID APPROACH IN MICROSURGERY OF ACOUSTIC TUMOR

DEPT OF OTOALRYNGOLOGY-HNS, EUNPYOENG ST MARYS HOSPITAL, THE CATHOLIC UNIVERSITY OF KOREA

KI-HONG CHANG

Preoperative hearing and tumor size are known to be the most important factors in choosing surgical approach. According to these view point, surgical treatment of acoustic tumor includes a translabyrinthine approach, middle fossa approach and retrosigmoid approach. Recently, incidence of small sized acous-

tic tumor is increasing with popular use of magnetic resonance imaging. Therefore, it is more important to functionally preserve the hearing and facial function than past. Fundus, located on lateral to internal auditory canal, is a small and wedge shaped area. This anatomical location may give surgeon some problem in exposure and managing nerves. We have to focus on the fundus area for preserving the hearing and facial nerves functionally in a small-sized tumor. We are using the middle fossa and retrosigmoid approach to preserve the hearing and facial nerve function. The retrosigmoid approach can be used in patients with preoperative good hearing regardless of the tumor size, but there is a limit in securing the surgical field when the tumor invades the fundus. In contrast, middle fossa approach, which is also able to preserve hearing like the retrosigmoid approach, is easy to treat fundus, but is difficult to use when the tumor is large. I am going to show surgical videos of microsurgery of small sized acoustic tumor to compare the pros and cons of middle fossa and retrosigmoid approach, and also to demonstrate surgical tips for handling tumor and neurovascular structure. With this video session, I hope audience get some cues for surgical treatment of acoustic tumor.

## 비과 Video session

17일(목) 10:30~16:50, 18일(금) 08:00~15:10  
• 엑스포홀 로비

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

### CORRECTIVE RHINOPLASTY USING EXTRACORPOREAL SEPTOPLASTY TECHNIQUE

CHUNGBUK NATIONAL UNIVERSITY

WOO SUB SHIM

Deviated nose is frequently encountered in rhinoplasty causing both functional and esthetic problem. Ethnically, Asian patients have relatively low profile nose comparing to Caucasian nose and thus most common procedure in Asian rhinoplasty is augmentation rhinoplasty. For harmonious augmentation rhinoplasty, nasal tip modification is mandatory. For major tip modification, septal extension graft is most common procedure nowadays, but it has some drawbacks. It needs strong and enough amount of harvestable cartilage to modify tip projection and to prevent bending. If the L-strut is deviated, septal extension graft technique is more challenging. The author prefers to use extracorporeal septoplasty(ECS) technique to correct deviated septum and to make a major modification to nasal tip simultaneously. In this video, the author shows surgical technique and tips for successful outcomes of ECS in functional rhinoplasty

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

### SEPTAL CARTILAGE TRACTION SUTURE TECHNIQUE FOR CAUDAL SEPTOPLASTY



DEPARTMENT OF OTORHINOLARYNGOLOGY, PUSAN  
NATIONAL UNIVERSITY HOSPITAL

KYU-SUP CHO

Patients with caudal septal deviation account for 5–8% of patient with nasal septal deviation. Caudal septal deviation may result in nasal obstruction, a crooked nose, columellar irregularities, and nostril asymmetry. Incomplete correction of the caudal septal deviation has been known to be the main reasons for persistent septal deviation after primary septoplasty. It is difficult to correct caudal septal deviation using classical technique of septoplasty because small residual deviation can cause severe nasal obstruction and weakening of the caudal septal support can lead to subsequent deformity of external nose. Many techniques such as cross-hatching incision, horizontal mattress suture, septal batten graft, wedge resections, swing door technique, and cutting and suture technique have been used in managing caudal septal deviation. However, caudal septal deviation is difficult to correct because the intrinsic cartilage memory is hard to overcome. Furthermore, these techniques are also known to cause complications including weakening of cartilages, overcorrection, and subsequent nasal deformity. We have developed a new operative technique called “septal cartilage traction suture”, which can be used successfully in patients with caudal septal deviation. In this video lecture, we will demonstrate the details of this technique and postoperative outcomes.

**17일(목) 10:30~16:50, 18일(금) 08:00~15:10**

## **TONGUE BASE SURGERY IN OBSTRUCTIVE SLEEP APNEA**

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL  
NATIONAL UNIVERSITY COLLEGE OF MEDICINE

HYUN JIK KIM

1. Treatment of obstructive sleep apnea – cure for repetitive arousals, nocturnal hypoxemia, disruption of sleep architecture – prevent severe complications: neurocognitive diseases, cardiovascular diseases, endocrinologic diseases \* Surgical approaches – increase or stabilize the size of the airway: removing or repositioning redundant tissues – mainly at the level of soft palate □ main area of airway obstruction : nasal cavity / uvula / tonsil / tongue base / glottis – Appropriate surgery: positive outcomes, 50–60% of OSA patients \* Cause of failure for surgical treatment – Inappropriate interpretation of sleep study – Unskilled surgical techniques – misunderstanding the exact site for airway collapse or obstruction 2. Decision making for Tongue base surgery for OSA patients – Diagnosis for OSA & evaluation of severity with sleep study : recommend Tongue base surgery to patients with moderate or Severe OSA – Investigation of anatomic structures and obstructive or collapse levels of upper airway : Physical examination including Muller maneuver & Cephalography : Drug-induced sleep endoscopy for retroglossal area narrowing : over grade 1 narrowing at retroglossal area – Consider the Patients’ needs, general condition and disease history 3. The types of tongue base surgery – Endoscopic-assisted Tongue base resection with coblator – Robot-assisted Tongue base resection (TORS) □ Genioglossus advancement / hyoid suspension / Midline glossectomy / Maxillomandibular advancement 1) Considerations for Tongue base procedure – Combined with nasal or palatal surgery, rarely done alone – Part of multi-level surgery – Knowledge of anatomy and important structures is critical □ 2) Address the tongue base by three mechanisms – Tissue reduction – Improved tension – Increased airway space 4. Peri- or post-operative management after Tongue base surgery – Medical optimization of comorbidities – Elevation of the head of the bed (45 degree) – O<sub>2</sub> mask with humidity – Monitor of O<sub>2</sub> saturation with pulse oximeter – Ice packing on submental area for 24 hrs – Systemic

antibiotic and steroid for 48 hr and discharge at post-operative 2 days – Discharge criteria include Stable airway □ Adequate PO intake of fluids: maintain the soft diet for at least 2 weeks □ Pain control

## 두경부 Video session

17일(목) 10:30~16:50, 18일(금) 08:00~15:10  
• 엑스포홀 로비

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

### FUNCTIONAL IMAGING FOR EVALUATION OF VOCAL FOLDS VIBRATION

DEPARTMENT OF OTORHINOLARYNGOLOGY HNS, PUSAN  
NATIONAL UNIVERSITY HOSPITAL  
SOO-GEUN WANG, JC LEE, YW LEE

Laryngeal videostroboscopy has been used primarily in clinical practice. However, the images from videostroboscopy are illusory, as they are collected from different cycles. In addition, it is impossible to examine vocal cord vibration in cases of very irregular vocal fold vibration or short sustained vowel phonation. Laryngeal high-speed videolaryngoscopy (HSV) provides more accurate information on vocal fold vibration. However, HSV has not been widely used in clinical practice because of practical limitations, such as the considerable time necessary for encoding and recording, the extremely large storage necessary for archiving, and the intense concentration required to analyze HSV images. Functional imaging is a post-processing imaging technique that can be created from high-speed videolaryngoscopic images. These techniques can analyze easily and objectively the vocal folds vibration. We would like to present the functional imaging technique in this video session.

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

**PULL-THROUGH RESECTION IN ADVANCED TONGUE CANCER**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIVERSITY COLLEGE OF MEDICINE

SEUNG-KUK BAEK

The histopathologic status of the resection margins has long been used as a potential indicator of local recurrence and survival, but there is still considerable uncertainty concerning many aspects of resection margins, including their nomenclature and definition, and the influence of anatomical and histological factors. Even if most of procedures are acceptable for identification of mucosal or superficial margins, involved deep margins are more of a problem than the involved mucosal margin and anatomical restraints are more likely to affect the deep margins. Especially, the deep margin in tongue cancer is one of the important prognostic factors, considering the significance of the depth of invasion. Pull-through resection is a useful technique with a good cosmetic outcome, but it can make it difficult to get an adequate resection margin in advanced tongue cancers. Especially, when tongue cancers are resected after pulling the tongue tissues through mandibles down, it may be difficult to get an adequate resection margin because the tongue tissues are squeezed and distorted. Therefore, we report a technique removing tongue cancer while keeping it in the oral cavity using the anatomical consideration of tongue, and then performing posterior resection after pulling the tongue tissue down.

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

**DIVERSE MICROSURGICAL TECHNIQUES IN HEAD AND NECK RECONSTRUCTION**

DEPARTMENT OF OTORHINOLARYNGOLOGY - HEAD AND NECK SURGERY, SAMSUNG MEDICAL CENTER, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE

MAN KI CHUNG

Head and neck reconstruction with microvascular free tissue transfer has been implemented for over 50 years, with an excellent success rate greater than 95 %. To guarantee the optimal outcomes of the tricky surgical procedure, confident microsurgical techniques must be performed. It is quite often that the geometry of the vessels is not as simple as we expected before the surgery, so a surgeon needs to acquire and get used to a different and stressful situation for microvascular techniques. In this session, diverse microsurgical techniques, which can be useful for reconstructive surgeons, will be discussed.

17일(목) 10:30~16:50, 18일(금) 08:00~15:10

**RECONSTRUCTION OF THE DEFECTS AFTER TRANSORAL RESECTION OF TONSILLAR CANCER**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

MIN-SIK KIM

**목적:** Reconstruction after tonsillar tumor resection is an important issue for head and neck surgeons. The aim of the present study was to study the reconstruction methods in the primary reconstruction of defects after tonsillar cancer ablation. **방법:** We use the primary closure method in small tonsillar defects and regional flap reconstruction for bigger defects. Primary closure was successfully performed by three layer closure technique upto 4 cm defect and used regional flaps were buccinators myomucosal or submental flap. We checked the safe use of submental flap in N(+) tonsillar cancer patients. Also we compared the

methods to prevent soft tissue necrosis (STN) especially patients need to take the postoperative radiation therapy. **결과:** Primary closure can apply for the small defect after resection of tonsillar cancer. But healing by secondary intention may have the risk for STN especially in the postoperative radiation group. In the larger defects and high risk group for STN, regional flap reconstruction provides the safe and versatile methods to finish the adjuvant therapy without any risk of STN. Regional flap, especially submental flap, can use to reconstruct tonsillar defect without oncologic risk even in N(+) tonsillar cancer patients (no metastatic nodes in level Ia). **결론:** For the reconstruction of the defects after complete resection of tonsillar cancer, various methods can apply safely depends on the nature of defects. We can discuss the best option for reconstructing the defects to prevent the serious complication after resection of tonsillar cancer.

**17일(목) 10:30~16:50, 18일(금) 08:00~15:10**

## **PAROTIDECTOMY A TO Z**

INTERNATIONAL ST MARYS HOSPITAL

HYUN JUN HONG

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Parotidectomy: A to Z I. GENERAL CONSIDERATIONS II. PREOPERATIVE PREPARATION III. OPERATION NURSING CONSIDERATIONS IV. ANESTHETIC CONSIDERATIONS V. OPERATIVE PROCEDURE VI. DOCUMENTATION: OPERATION NOTE VII. POSTOPERATIVE CARE

## 포스터 전시(이과)

08:00~15:10 • 컨퍼런스 홀

### OTPE-01

#### RAMSAY HUNT SYNDROME INVOLVEMENT WITH DELAYED FACIAL PALSY AND MULTIPLE CRANIAL NERVE

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, INCHEON ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, REPUBLIC OF KOREA

JANG KYUNGIL, HYUN JIN LEE

Ramsay Hunt syndrome is caused by the varicella zoster virus (VZV), and can affect the vestibular, trigeminal, and cochlear nerve resulting in various cranial neuropathies. A 24-year-old man presented with a 3-day history of vertigo, along with a 2-day history of left-side otalgia, sore throat and hoarseness. On otologic examination, a few vesicles were observed on the left external auditory canal and tympanic membrane. Neurologic examination revealed peripheral left vestibulocochlear nerve (VIII) (decreased hearing and dizziness), involvement with glossopharyngeal nerve (IX) and vagus nerve (X) (palatal and laryngeal paresis with dysphonia). Laryngoscopic examination revealed erythema and white exudate covering the mucosa of the left arytenoid. The motility of the true vocal cords was decreased. An audiogram revealed a mild sensory neural hearing loss in the left ear. Magnetic resonance imaging with gadolinium enhancement of the brain revealed no abnormal lesions. After 2 weeks, delayed facial nerve (VII) palsy

(House-Brackman grade II) was occurred.

### OTPE-02

#### A CASE OF CEREBELLITIS DUE TO NEURO-BEH-CET DISEASE, INITIALLY MISDIAGNOSED AS VESTIBULAR NEURITIS

DEP OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, KOREA UNIV COLLEGE OF MEDICINE

SOOJEONG CHOI, EUYHYUN PARK

Behcet's disease(BD) is an autoimmune disease, which is characterized by recurrent oral and ulcer and uveitis. It can affect various organs, rarely central nervous system. In the literature, the incidence of Neuro-Behcet's disease(NBD) is about 5-10% of all cases. NBD can cause severe neurologic disability and long-term morbidity and mortality. However, the diagnosis of this disease still remains a challenging because certain infections may also produce similar features. In NBD, CNS can be involve in two ways : first, and most commonly, parenchymal type which is present with an inflammatory meningo-encephalitis. Subacute onset of brainstem syndrome with or without other cerebral hemispheric or spinal cord syndrome can occur; and the second, non-parenchymal type, which is commonly characterized with headache and visual features as a consequence of cerebral venous thrombosis. Serum serologic markers, neuroimaging, and other constitutional symptoms may be helpful for diagnosis. Here, we describe the case of a 47-year-old female patient with a previous diagnosis of vestibular neuritis who was later diagnosed for cerebellitis due to neuro-behcet disease.

### OTPE-03

#### WHY DOES MY BANANA TASTE SO SPICY? A

**CASE AND MINI-REVIEW**

<sup>1</sup>DEPARTMENT OF OTOLARYNGOLOGY, EUL-JI MEDICAL CENTER, EULJI UNIVERSITY, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

EUN BIT BAE<sup>1,2</sup>

An allergic symptom, one of immune-reactivity, commonly shows itching, swelling, and diarrhea. What if your patient complains about oral pain when he or she eats something which has known as not spicy like a well-ripened banana. And your patient does not show these of immune-reactivity or symptoms, what would you suggest to do as the next step for examining this symptom? We focused on this 'spicy banana symptom' that we heard from a patient of hyperacusis and reported via the supplementary information in our previous case report. Via internet searching, we gather several cases of the symptom and classified the characteristics of the symptom. It is different with allergic symptoms in that the symptom does not show any of immune responses in physical. From our hyperacusis patient, we got a clue that the primary somatosensory cortex which related in pain, hearing, and taste possibly involved in spicy banana symptom and hyperacusis. This study is for newly reporting a symptom of taste disorder in a hyperacusis patient. And the results suggest a mechanism of the spicy banana symptom with hyperacusis symptom and a correlation of the primary somatosensory cortex, hearing, and tastes

**OTPE-04**

### **A CASE OF ROTATIONAL VERTEBRAL ARTERY SYNDROME AFTER VERTEBRAL ARTERY DISSECTION**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, HANYANG UNIVERSITY, SEOUL, REPUBLIC OF KOREA

SONG JAE LEE, JAE HO CHUNG, HA YOUNG BYUN, SEUNG HWAN LEE

Rotational Vertebral Artery Syndrome (RVAS) is characterized by position-aggravated reversible verte-brobasillar ischemia. It is mainly induced by mechanical compression of a dominant vertebral artery (VA) in the setting of a hypoplastic contralateral vertebral artery. By rotating the head to one side, symptoms are provoked – such as tinnitus, vertigo and syncope, hence the name, Bow-Hunter Syndrome (BHS). In most cases, VA is compressed by external structures such as osteophytes, tendons, muscles and fibrous bands. This study reports a case of RVAS after verte-bral artery dissection (VAD). A 60-year-old male experienced recurrent tinnitus and vertigo while rotating the head to the right side. Neck CT images showed no abnormal structures near the course of both VAs. In 3-phase dynamic neck CT angiography, a focal VAD was noted at the right C6 transverse foramen. To prevent thrombo-embolic complications such as brain infarction and hemorrhage, two types of anti-coagulants were used and monitored during follow up visits. Herein, we report the case with a review of the literature.

**OTPE-05**

### **ACUTE UNILATERAL AUDIOVESTIBULOPATHY FROM INFARCTION OF POSTERIOR INFERIOR CEREBELLAR ARTERY(PICA)**

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

HARAM KANG, HO SUNG CHOI, KYUNG-HO PARK, JAE-HYUN SEO

Acute onset of vertigo and hearing impairment is a common set of symptoms encountered by otolaryn-

gologist in emergent room. The symptoms are usually thought to be the result of labyrinthitis associated with viral etiology. However, acute unilateral audiovestibulopathy can also result from cerebellar infarction of posterior circulation origin causing ischemic damage to the inner ear structures. The main vessel involved is labyrinthine artery, or internal auditory artery, which is known to branch mostly from anterior inferior cerebellar artery (AICA). However, there are several variations in its origin, including basilar artery (BA), superior cerebellar artery (SCA) and rarely, posterior inferior cerebellar artery (PICA). We report here an unusual case of patient who presented with acute vertigo and sudden deafness who later was diagnosed with cerebellar infarction involving PICA territory.

## OTPE-06

### A CASE OF CAPILLARY HEMANGIOMA FILLING MIDDLE EAR AND EXTERNAL AUDITORY CANAL CAUSING DEAFNESS

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SCHOOL OF MEDICINE, KYUNGPOOK NATIONAL UNIVERSITY

JIHOON LEE, DA JUNG JUNG, KYU-YUP LEE, MYUNG HOON YOO

Capillary hemangiomas are benign vascular tumors relatively common in the head and neck region but extremely rare in the middle ear (ME) and external auditory canal (EAC). We recently treated a 62-year-old man who complained of right-sided otorrhea and hearing disturbance, and presented with a reddish polypoid mass filling his EAC. This patient had visited our clinic 17 years ago but was lost to follow-up during pre-surgery work-up at that time. Over 17 years, the patient's conductive hearing loss progressed to total deafness, and the extent of the tumor expanded from the ME to EAC. We performed preoperative

embolization followed by surgical removal via trans-mastoid approach, and histological study revealed a capillary hemangioma. After surgery, he did not exhibit any signs of recurrence for 9 months.

## OTPE-07

### A CASE REPORT OF FACIAL NERVE PALSY TREATED NEURORRHAPHY

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, CHONBUK NATIONAL UNIVERSITY, JEONJU, KOREA

EUN JI KIM<sup>1</sup>, KI SUNG NAM, EUN JUNG LEE

Facial palsy is caused by a variety of causes, ranging from relatively rare diseases or head trauma to idiopathic Bell 'palsy, which is a relatively rare disease in the area of the otolaryngology that affects about 30 people per 100,000 people per year. It is susceptible to injury, and nerve palsy is a disease that can cause many problems in appearance, function and mentality in patients. In most cases, otitis media, including chronic otitis media, account for about 12.3% of all facial nerve palsy. We present a case of 77 years male, who present right facial nerve palsy. The patient was a cholesteatoma and had a previous history of surgery one year ago. One month prior to admission, he was on treatment with otalgia and otorrhea. We confirmed otomycosis and about 7mm temporal segment of facial nerve defect, so subtotal petrosectomy and neurorrhaphy with sural nerve graft. We present a case in which they describe the clinical approach and the related literature review.

## OTPE-08

### ARNOLD-CHIARI TYPE 1 MALFORMATION PRESENTING AS ATYPICAL BENIGN PAROXYSMAL

## POSITIONAL VERTIGO IN A 12-YEAR-OLD PATIENT

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD & NECK SURGERY, GYEONGSANG NATIONAL UNIVERSITY HOSPITAL, GYEONGSANG NATIONAL UNIVERSITY COLLEGE OF MEDICINE, JINJU, <sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD & NECK SURGERY, GYEONGSANG NATIONAL UNIVERSITY CHANGWON HOSPITAL, CHANGWON, <sup>3</sup>INSTITUTE OF HEALTH SCIENCES, GYEONGSANG NATIONAL UNIVERSITY, JINJU, KOREA

YOUNGCHUL KIM<sup>1</sup>, HYUN JIN LEE<sup>2</sup>, DONG GU HUR<sup>2</sup>, CHAE DONG YIM<sup>2</sup>, SEONG-KI AHN<sup>1,3</sup>

Arnold–Chiari malformation type 1 is a congenital condition characterized by herniation of the cerebellar tonsils into the upper cervical vertebrae through the foramen magnum. Most common clinical symptom is pain, including occipital headache and neck pain, upper limb pain exacerbated by physical activity or valsalva maneuvers. Various otoneurological manifestations also occur in patients with the disease, which has usually associated with dizziness, vomiting, dysphagia, poor hand coordination, unsteady gait, numbness etc. Patients with Chiari may develop vertigo after spending some time with their head inclined on their trunk. In this case, positional nystagmus and down beating is common. We experienced a 12-year-old female who presented complaining of vertigo related to changes in head position which was initially misdiagnosed as a benign paroxysmal positional vertigo. After several times of canalolith repositioning procedure, there is no improvement of symptoms. Eventually It is diagnosed as Arnold–Chiari malformation type 1 by brain Magnetic Resonance Image.

### OTPE-09

## CASE REPORT OF FACIAL PALSY PATIENT WITH FACIAL BURN AFTER ELECTRICAL STIMULATION THERAPY

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE

CHUN HAN, HAN SUNG MIN, JEON HYUN JONG, PARK SANG YOO

Dysfunction of the seventh cranial nerve often results in facial paralysis, asymmetry of the face, and loss of the ability to blink the eye, which can lead to corneal scarring and possible diminished vision. The treatment for idiopathic facial palsy along with the traditional treatment with high dose steroid includes electrical stimulation, a popular and long-established practice of physical rehabilitation electrically stimulating facial muscles rendered paralyzed with idiopathic peripheral type facial palsy(Bell's palsy). While the role of noninvasive electrical stimulation in managing long-standing facial paralysis remains controversial, most literature states electric stimulation therapy to be a safe treatment modality with no notable harm to the patient. However, our institute has experienced a case of electric burn around the right eyelid while receiving electrical stimulation therapy and would like to represent our case report to enlighten the fact that electric stimulation therapy may not be as unharmed as we believe it to be.

### OTPE-10

## TWO DIFFERENT CASES OF SIMULTANEOUS BILATERAL FACIAL PALSY

DEPARTMENT OF OTOLARYNGOLOGY HEAD & NECK SURGERY, INJE UNIVERSITY

YEONG-JUN PARK, BYUNG-WHOO PARK, SHIN-HYE KIM, MOO-JIN BAEK

Bilateral facial palsy is a rare clinical entity which accounts for 0.3– 2.0% of the facial palsy cases. Simultaneous onset of facial palsy is defined as the involvement of the opposite side within 4 weeks of the onset



of the first side. The differential diagnosis of its causes can be extensive—neurological, infectious, neoplastic, traumatic, metabolic or degenerative disorders are reported to have bilateral facial palsy. Although it can be a diagnostic challenge, rapid diagnosis is essential for proper treatment. We report our experience of two successfully treated cases with bilateral facial palsy recently seen in our practice; one with Guillain–Barre syndrome presenting with bilateral facial palsy, and the other with bilateral Bell’s palsy.

#### OTPE-11

### A CASE OF CONFUSING CEROMINOUS ADENOMA OF EXTERNAL AUDITORY CANAL

DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD & NECK SURGERY, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

YOUNG JUN SEO, HYUG JAE LEE, SU BIN HAN, JUNG MI PARK, JAE SANG HAN, JAE HYUN SEO, KYOUNG HO PARK

이구 선종은 외이도의 연골 부위 피부에 있는 이구선에서 기원하는 양성 종양이다. 개와 고양이에서는 다소 흔하지만, 인간에서 발생하는 것은 희귀하여 지금까지 세계적으로 150여 건, 한국에서는 단 6건만 보고되었다. 이구선종은 그 희귀성과 임상적 증상의 비특이성으로 인해 진단방법과 치료법에 대한 정확한 기준이 마련되지 않은 상태이며, 이로 인해 임상이가 수술 전 진단을 내리기는 쉽지 않은 것으로 알려져 있다. 본 저자들은 우측 청력 저하와 이루를 주소로 내원하여 외이 종괴 의심하여 외래에서 조직검사상 양성 소견을 보여 유양돌기 삭개술을 포함한 종양 절제술을 계획하고 수술을 진행하던 중 외이도에서 종괴 제거중 확인된 성상이 악성이 의심되어 1차 수술 중 시행한 동결절편 검사상 악성 소견을 보였다. 이에 외이도 조직에 대한 조직 검사만 시행하고 수술을 마친 후 추가 악성 종양에 대한 추가 검사를 시행하고 측두골 전 절제술을 계획하였다 이후 추가적인 조직검사에서 다시 양성 소견이

확인되어 외이도, 고실 및 유양동에 대한 근치 수술을 통하여 완치하였다. 이에 외이도와 고실, 유양동을 침범한 이구선종에 대한 치험 1례를 문헌 고찰과 함께 보고하는 바이다.

#### OTPE-12

### OSTEOMA IN THE EXTERNAL AUDITORY CANAL: TWO CASES OF A RARE TUMOR

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY, NATIONAL HEALTH INSURANCE SERVICE ILSAN HOSPITAL,

<sup>2</sup>DEPARTMENT OF PATHOLOGY, NATIONAL HEALTH INSURANCE SERVICE ILSAN HOSPITAL

KYUIN LEE<sup>1</sup>, YOON JUNG CHOI<sup>2</sup>, HYUN SEUNG CHOI<sup>1</sup>, JUNHUI JEONG<sup>1</sup>

Osteoma of the external auditory canal (EAC) is a rare benign tumor with an estimated incidence of 0.05%. We present two cases of this rare tumor. A 23-year-old woman visited our clinic with symptoms of aural fullness in the right ear for several months. On physical examination, a cystic hard mass was observed in the right EAC. Because the tumor was of bone origin, surgical excision was planned. With microscope assistance, the mass was surgically excised at the level of the peduncle with the patient under local anesthesia. The base of the excised mass was drilled with a diamond burr to remove all osseous lesions. Histopathologic findings revealed spongiotic osteoma. A 19-year-old man visited our clinic with a known mass in the right EAC. As in former case, surgery was performed, and pathology revealed an spongiotic osteoma. EAC osteoma is rare and can be observed without immediate therapy if there are no symptoms. However, excision should be actively considered in symptomatic patients for the following reasons: osteomas can grow, surgical excision is more difficult with larger masses, and EAC cholesteatomas can develop secondary to EAC obstruction.

OTPE-13

**A CASE REPORT OF EXOSTOSIS OF BOTH EXTERNAL AUDITORY CANAL IN A PATIENT WITHOUT HISTORY OF COLD WATER EXPOSURE**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, BUSAN PAIK HOSPITAL, INJE UNIVERSITY COLLEGE OF MEDICINE, BUSAN, KOREA

DONGHOO LEE, SI HONG CHOE, SUNG YOOL PARK, KYUNG WOOK HEO

Exostosis of external auditory canal (EAC) is broad-based lamellated bony outgrowth, which is typically common in individuals who frequently participate in aquatic activities. It forms most commonly as a reaction to cold water exposure in surfers. Also, it also occurs in other aquatic sport players such as swimmers, divers, and kayakers. Not to be confused with external auditory canal osteomas, this disorder is more commonly bilateral and manifests as multiple formation. However, without those specific past history of cold water exposure, idiopathic EAC exostosis have seldom been reported. In this case report, we present a 50-year-old male without history of cold water exposure complaining bilateral ear fullness and progressive left hearing loss. The diagnosis was bilateral exostosis of EAC by physical examination, computed tomography, and audiometries. Under general anesthesia, canaloplasty and type I tympanoplasty via retroauricular approach was done to the left ear due to preoperative conductive hearing loss. There was no recurrence or complications during the following 12 months postoperatively. We report this case with a review of literature.

OTPE-14

**CONGENITAL CLEFT EARLOBE - VARIOUS SURGICAL TECHNIQUES WITH A SCOPING REVIEW OF**

**THE LITERATURE**

DEPARTMENT OF OTOLARYNGOLOGY HEAD AND NECK SURGERY, INJE UNIVERSITY COLLEGE OF MEDICINE, HAEUNDAE PAIK HOSPITAL

YEONG JUN PARK, MOO JIN BAEK, SHIN HYE KIM

Congenital cleft earlobe deformities are rare type of ear deformities, occurring in 1:15,000 live births. Failure of fusion of auricular components hillock 1 and hillock 6 is probably the cause of cleft earlobe. The cleft earlobe are classified into four subtypes according to external appearance and the corrective methods required; defective, tag and cleft, tag and cleft with hypoplasia, and simple type. Herein, we report a case of 7 year-old boy presented with right defective type congenital cleft earlobe. The case was successfully reconstructed with a simple local flap technique, and our technique can be easily applicable in moderate to severe degree of defective type cleft earlobe. Prompted by this case, we also present several surgical techniques to correct congenital cleft earlobe deformities with a scoping review of the literature. Various reconstructive methods including simple suture in longitudinal direction, Z-plasty, subdermal back flap and Y-V advancement, and chondrocutaneous postauricular arterial flap have been described according to the subtypes and severity of the cleft earlobe.

OTPE-15

**A CASE OF TOTAL AURICULAR RECONSTRUCTION IN A PATIENT WITH MICROTIA**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, BORAMAE MEDICAL CENTER, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL, KOREA

HYUNKYUNG CHA, DONG-HAN LEE, MIN-HYUN PARK

네팔 국적의 11살 여자 환자가 좌측 선천 외이도 기형을 주소로 내원하였다. 검진상 외이도는 없고 Marx grade III의 소이증, 내원 1년전 네팔에서 시행 한 이개 회전술의 흉터가 관찰되었다. 순음청력검사상 우측 5dB, 좌측 30/70dB의 전음성 난청, 측두골 CT상 Jahrsdoerfer score는 7점이었다. 2018 년 10월 23일 전신마취하에 이개 재건술(Nagata technique)을 시행하였다. 견측 귀를 참고하여 템플릿을 제작 후, 좌측 6-8번 늑연골을 이용해 이륜과 대이륜, 이갑개 및 이주를 만들어 철사로 결합 후 피하 포켓에 삽입하는 1단 계수술 후 20일째 퇴원하였다. 5개월 뒤인 2019년 03월 12일 2단계 수술을 시행하였다. 추가 채취한 늑연골을 기존 이식한 연골 뼈대 밑에 삽입하여 이 개를 상승시키고 부족한 피부는 두피로부터 부분층 피부이식을 시행 후 13일 째 퇴원, 수술 1달 후 특이 합병증 없이 네팔로 귀국하였다. 국내 체류시간 의 부족 및 수술 후 관리의 어려움이 예상되어 외이도 성형술은 시행하지 못하였다.

## OTPE-16

### A CASE OF STEOMA ORIGINATING FROM MASTOID CORTEX

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SAMSUNG CHANGWON HOSPITAL, SUNGKYUNKWAN UNIVERSITY SCHOOL OF MEDICINE,

<sup>2</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, ANSAN HOSPITAL, KOREA UNIVERSITY COLLEGE OF MEDICINE

DONG MIN SHIN<sup>1</sup>, YOUNG-SOO CHANG<sup>2</sup>, JIWON SEO<sup>1</sup>

Osteoma of the temporal bone is a rare benign tumor with incidence of 0.1% – 1% of all benign tumors of skull. External auditory canal is the most common site of osteoma, and mastoid osteoma is very rare. A case of 21-years-old female presented to our department in 2015 with a hard mass behind the right ear which originated from mastoid cortical bone. She was diag-

nosed with osteoma of mastoid and was not followed up. 3 years later, the patient visited again and the mass was growing. The resection of whole bony tumor with mastoid cortical bone was performed with retroauricular approach. Although our case is smaller than previously reported cases in terms of the size and the extension, our case is unique in that we have been able to see the degree of change in the size of the osteoma over a 3-year interval.

## OTPE-17

### GADOLINIUM-ENHANCED MRI IN MENIERE'S DISEASE AND SUDDEN SENSORINEURAL HEARING LOSS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, CHONBUK NATIONAL UNIVERSITY

YEON-SEOK YOU, EUN-JUNG LEE

Meniere's disease(MD) is associated with impaired hearing, tinnitus, vertigo, and aural fullness. MD and idiopathic sudden sensorineural hearing loss(SSNHL) are two different diseases; however, they do overlap in some cases. Many patients with SSNHL, especially low-tone SSNHL, later develop MD. Many anatomical studies have suggested idiopathic endolymphatic hydrops as the pathological basis of MD, which now can be visualized by using gadolinium-enhanced magnetic resonance imaging of the inner ear. We performed gadolinium-enhanced magnetic resonance imaging of the inner ear in patients diagnosed with MD and SSNHL at our hospital and compared the results.

## OTPE-18

### OPSOCLONUS IN CHILD WITH ACUTE VIRAL GAS-

## TROENTERITIS, A CASE REPORT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, CHONBUK NATIONAL UNIVERSITY, JEONJU, KOREA

JI SEOB YOO<sup>1</sup>, EUN JUNG LEE<sup>2</sup>

Opsoclonus is an ocular dyskinesia which is a sudden, involuntary, non-fixed, fast-moving eye movement. It is frequently accompanied by myoclonus or ataxia, in this case called opsoclonus-myoclonus syndrome. Opsoclonus-myoclonus syndrome is a rare immune-mediated disease that can be caused by idiopathic, parainfectious and paraneoplastic causes. We recently encountered a very rare opsoclonus patient in a child, in acute phase. A 13-year-old girl was admitted to the pediatric department of our hospital with vomiting and diarrhea occurring 10 days ago, and consulted to our otolaryngology department due to nausea and non-spinning type dizziness. Ocular examination showed an opsoclonus pattern and no other abnormal findings were observed in CSF study, Brain MRI, EEG. Opsoclonus-myoclonus syndrome was suspected and other evaluation was performed. After steroid pulse therapy, the patient's symptoms improved. Previously, Opsoclonus-myoclonus syndrome has been reported steadily in worldwide, but very rarely in the field of otolaryngology. So we report this case with a review of the literature.

### OTPE-19

## CAN THE CEREBELLOPONTINE ANGLE TUMOR-INDUCED MASS EFFECT CAUSE ENDOLYMPHATIC HYDROPS ? A CASE REPORT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, CHONBUK NATIONAL UNIVERSITY, JEONJU, KOREA

JONG-HWAN LEE, EUN-JUNG LEE

Endolymphatic hydrops (EH) is a pathologic finding of distended endolymphatic space by and enlargement of endolymphatic volume. EH has been associated with episodic vertigo and fluctuating hearing loss. Various disease processes are associated with findings of primary endolymphatic hydrops, including embryopathic process, such as Mondini dysplasia; and idiopathic process, such as Meniere's disease. Traumatic and inflammatory processes may result in secondary endolymphatic hydrops. Secondary endolymphatic hydrops (SEH) occurs if the endolymph resorption system results from a variety of causes, each of which is induced by either traumatic or inflammatory events. Either traumatic or inflammatory processes could lead to resultant changes in cerebrospinal fluid pressure. Such changes in CSF pressure have been proposed as a cause for SEH due to the perilymph being in continuity with the CSF, however, the exact pathophysiology of this process is unknown. We report our experience of a 85-year-old female Cerebellopontine angle meningioma patient who presented with spinning-type episodic vertigo, spontaneous resolution, aural fullness and hearing loss.

### OTPE-20

## A CASE OF HETEROTOPIC SALIVARY GLAND TISSUE OF THE MIDDLE EAR

DEPARTMENT OF OTORHINOLARYNGOLOGY, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA, SEOUL, KOREA

JUNUK LEE, JUNG MEE PARK, JAE SANG HAN, SHI NAE PARK

Heterotopic salivary gland tissue (HSGT), also known as salivary gland choristoma, is defined as the histologically normal salivary gland tissue found in organs other than salivary glands. HSGT in middle ear is an extremely rare entity. It is considered as a result of de-

developmental abnormality and may be associated with abnormalities of adjacent structures. A 59-year-old male patient, who suffered from the left side hearing impairment after a head trauma 40 years ago, visited our outpatient clinic. The audiogram showed severe conductive hearing loss on the left side and small soft tissue density filling in the middle ear cavity was observed. Explotympanotomy was done for diagnosis as well as treatment. The stapes was surrounded by yellowish soft tissue and adhered to exposed tympanic segment of the facial nerve. After removing the soft tissue, ossiculoplasty was followed. The final pathological diagnosis was HSGT and the patient is under observation without any complications.

#### OTPE-21

#### A CASE OF SKULL BASE OSTEOMYELITIS FOLLOWING A MASTOIDECTOMY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY COLLEGE OF MEDICINE

GEON WOO KIM, HWI KYEONG JUNG, JAE SOON KIM, CHANG WOO KIM

Skull base osteomyelitis is a rare but life-threatening condition that is characterized by osteitis of the temporal bone and skull base. The present study reported a case of an 83-year-old male patient who suffered severe otalgia following a canal wall down mastoidectomy. The clinical and radiological characteristics, as well as the outcome of the patient, were presented.

#### OTPE-22

#### TWO RARE CASES OF CEREBRAL ABSCESS FORMATION DUE TO THE CHRONIC OTITIS MEDIA

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND

NECK SURGERY, PUSAN NATIONAL UNIVERSITY SCHOOL OF MEDICINE, BUSAN

DONGJO KIM, ILWOO LEE, SANGHYO LEE, HYUNMIN LEE

Intracranial complications of chronic otitis media(COM) have been rarely reported recently due to the development of antibiotics and diagnostic techniques. However, careful examination should be taken because COM with intracranial complications with fatal outcomes is rarely identified. Cases were 63-year-old and 56-year-old female, with various symptoms, and COM and brain abscess were identified by temporal bone computed tomography and magnetic resonance imaging. Emergency surgery of drainage of the brain abscess and intact canal wall mastoidectomy with tympanoplasty were performed. After surgery, the two cases showed different outcomes. The authors report and review about the case and related literature .

#### OTPE-23

#### A CASE OF HUGE CHOLESTEATOMA TREATED BY OPEN CAVITY MASTOIDECTOMY WITHOUT MEATOPLASTY WITH SPLITTED PALVA FLAP OBLITERATION

<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, <sup>2</sup>DEPARTMENT OF PATHOLOGY, BUNDANG JESANG GENERAL HOSPITAL, DAEJIN MEDICAL CENTER, SUNGNAM, KOREA

YUN-SUK AN<sup>1</sup>, KYU-HA SHIN<sup>1</sup>, JU-CHANG KANG<sup>1</sup>, HAN-KYUNG SUNG<sup>1</sup>, SO-YA PAIK<sup>2</sup>

Cholesteatomas are benign, progressive lesions that have embryologic derivation and usually result in progressive exfoliation and confinement of squamous epithelium behind an intact or preciously infected tympanic membrane. We report a case of 80-year-old

female with a huge cholesteatoma. The patient's major symptom was hearing impairment in the left ear. The radiological and surgical findings were a 2cm-sized cholesteatoma from middle ear to antrum, mastoid with tegmen, LSCC defect and ossicular erosion. We successfully treated with Open canal mastoidectomy with tympanization without meatoplasty with splitted palva flap obliteration.

## OTPE-24

### CLINICAL MANIFESTATION AND DIAGNOSTIC/TREATMENT CHALLENGES OF RECURRENT MIDDLE EAR ADENOMA: A CASE REPORT

DEPARTMENT OF OTORHINOLARYNGOLOGY, BORAMAE MEDICAL CENTER, SMG-SNU, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE

JAYOUNG OH, DONG-HAN LEE, MIN-HYUN PARK

Middle ear adenoma is a very rare, progressive disease that can sometimes be confused with cholesteatoma and other benign middle ear tumors. Associated symptoms are not clearly specified, and surgical treatment is the only option due to its radio-resistant feature. Herein, we report a case of 24-year-old woman presented with exacerbation of earfullness, otalgia, and itching sensation in her left ear despite the medical treatment, with newly appeared left facial palsy. Severe bulging of her left tympanic membrane was revealed by otoscopy. CT scan showed mass-like soft tissue in her left middle ear, and magnetic resonance imaging showed locally enhancing lesion without diffusion, implying granulation tissue rather than cholesteatoma. The patient underwent canal down mastoidectomy and complete resection of the tumor which was extending from round window to hypotympanum. Final pathologic diagnosis reported middle ear adenoma with neuroendocrine differentiation. As follow-up postoperative PET scans showed remnant and re-

curred tumor, she received additional two operations for complete tumor removal. Her left facial palsy and remnant symptoms have dramatically improved after the surgery.

## OTPE-25

### A CASE OF ACTIVE TRANSCUTANEOUS BONE CONDUCTION IMPLANTATION (BONEBRIDGE™) SIMULTANEOUSLY PERFORMED WITH SUBTOTAL PETROSECTOMY

DEPARTMENT OF OTOLARYNGOLOGY-HNS, SEOUL ST MARYS HOSPITAL, COLLEGE OF MEDICINE, THE CATHOLIC UNIVERSITY OF KOREA

JAE SANG HAN, JUNG MEE PARK, YUN JIN KANG, SHI NAE PARK

Subtotal petrosectomy(STP) is an effective treatment modality for chronic suppurative otitis media(CSOM) with nonserviceval hearing. Cochlear implantation(CI) can be combined with STP for hearing rehabilitation, especially in the bilaterally deafened patients with CSOM. An active transcutaneous bone conduction implantation(BCI) system, known as Bone Bridge(BB, MED-EL), is indicated for conductive or mixed hearing loss as well as for single-side deafness, but no cases of BB implanted during STP have been reported yet. A 37-year-old woman who had previously undergone radical mastoidectomy visited our clinic. Her left ear was deaf whereas right side hearing was normal. CT scan showed total ossification of the left cochlea, indicating that CI was impossible for her hearing rehabilitation on the left side. STP was performed and simultaneous bone conduction-floating mass transducer of the BB was placed in sinodural angle. A month later, the sound processor was applied successfully without any complications. This case suggests that BB implantation with STP may be another effective therapeutic option for hearing rehabilitation

in the patients with and single sided deafness caused by CSOM.

#### OTPE-26

### COCHLEAR IMPLANTATION IN A PATIENT WITH OSSIFIED COCHLEA

DEPARTMENT OF OTOLARYNGOLOGY OF KEIMYUNG UNIVERSITY DONGSAN MEDICAL CENTER

JUN-WAN PARK, SEOK-CHAN YOO, SEOK-YOON LEE, TAE-WOO GIM, SUNGIL NAM

58세 여자 환자가 양측 난청을 주소로 본원 외래에 방문하였다. 과거력상 어린 시절부터 고열 있는 후 양측 난청이 시작되었고, 내원 약 10여년 전 LMC에서 보청기 착용 권유받고 착용하였으나 별 효과가 없이 지내다. 2019년 인공와우이식술 받기 위해 본원 외래 재방문하였다. 내원 당시 오른쪽 보청기 착용하였고 양측 고막은 정상 소견 확인되었다. 순음청력검사서 오른쪽 기도/골도 74/NR, 왼쪽 기도/골도 청력 무반응 소견이었다. 술전 컴퓨터 단층촬영에서 양측 유양동 및 중이강, 내이 모두 해부학적으로 이상 소견 없었으나, 와우 저부에 부분적 골화인 것이 확인되었다. 저자는 인공와우 이식술을 성공적으로 진행하였기에 증례로 보고하고자 한다.

utive frequencies. Its incidence is estimated at 10 to 20/100,000 people per year. The cause of this pathology is still unknown, so in most cases it is considered idiopathic. However, it is known that in less than a third of the patients, this disorder can be attributed to viral infection, trauma, neoplasms, ischemic/hemorrhagic alterations, and autoimmune diseases. Several mechanisms by which the human immunodeficiency virus (HIV) can affect hearing are described in the literature. direct injury to the central nervous system or cochlear nerve, neoplasms in the central nervous system, the ototoxic effect of antiretroviral medications, and even predisposition to other viral infections (herpes virus, cytomegalovirus, and others) are also related to SSNHL. But the relationship between HIV and hearing loss is still unclear. we would like to report two cases of HIV related SSNHL.

#### OTPE-27

### HIV WITH SUDDEN SENSORINEURAL HEARING LOSS; 2 CASES REPORT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, CHONBUK NATIONAL UNIVERSITY, JEONJU, KOREA

SU GEUN KIM, EUN JUNG LEE

Sudden sensorineural hearing loss (SSNHL) is an acute inner ear dysfunction characterized by hearing loss greater than 30dB in at least three consec-

## 포스터 전시(비과)

08:00~15:10 • 컨퍼런스 홀

### RHPE-01

#### PLEOMORPHIC ADENOMA AND LOBULAR CAPILLARY HEMANGIOMA OF NASAL SEPTUM: A CASE REPORT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SOONCHUNHYANG UNIVERSITY COLLEGE OF MEDICINE, BUCHEON HOSPITAL, BUCHEON, KOREA  
YUNJI LEE, HYO JUN KIM, JAE YONG LEE, JI HO CHOI

Pleomorphic adenoma is a relatively common benign tumor originated from the major salivary glands and it can occasionally occur in the minor salivary glands including nasal cavity. Lobular capillary hemangioma (pyogenic granuloma) is also common benign vascular lesion that sometimes occurs on mucosa including nasal cavity. It is very rare for pleomorphic adenoma and lobular capillary hemangioma to occur simultaneously in the nasal septum. Here, we report the case of pleomorphic adenoma and lobular capillary hemangioma simultaneously arising from the nasal septum. A 63-year-old female patient presented with frequent left nasal bleeding for several months and PNS CT showed two small masses in the anterior portion of left nasal septum. One is about 0.3 x 0.4 cm sized heterogeneously enhancing mass in left nasal septum and the other is about 0.8 x 0.6 cm sized strong enhancing mass in left nasal cavity, attached to nasal septum. After surgical therapy, the patient was finally diagnosed with pleomorphic adenoma and lobular

capillary hemangioma based on histopathological and immunohistochemical examinations. There was no any local recurrence in the follow-up for 10 months.

### RHPE-02

#### COMPLETE REMOVAL OF ISOLATED MAXILLARY SINUS CYST UNDER NAVIGATION ASSISTED ENDOSCOPIC APPROACH

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, GACHON UNIVERSITY SCHOOL OF MEDICINE, GIL MEDICAL CENTER

JEONG-WOO PARK, JAE-HWAN OH, JOO-HYUN JUNG, SEON-TAE KIM

Postoperative cheek cyst are frequently found in the patient who has received the Caldwell-Luc operation previously. In these patients, sometimes there are found small isolated cystic cavities septated by bony growth. The masupialization of these small cysts are difficulty under the endoscopic approach because they are sometimes located under the inferior wall of orbital cavity. We have used the navigation approach in these small maxillary cysts in 6 patients. Five patients are post operative cheek cysts and one patient is fibrous dysplasia. In these patients, unidentified locations of these small cysts were confirmed by navigation and safely removed without complications.

### RHPE-03

#### CONCOMITANT ANTROCHOANAL POLYP AND FUNGUS BALL IN UNILATERAL MAXILLARY SINUS

DEPARTMENT OF OTOLARYNGOLOGY, WONKWANG UNIVERSITY SCHOOL OF MEDICINE

MYEONG SIN KANG, SEUNG YOON HAN, DONG HYUN KIM, JAE HOON LEE



The concomitant appearance of an antrochoanal polyp and a fungus ball in unilateral maxillary sinus is rare. These disease entities may be difficult to distinguish before surgery. A female patient presented with the characteristic symptoms of chronic rhinosinusitis. A preoperative sinus computed tomography scan revealed unilateral sinus opacification, calcified spots, and choanal mass. During the operation, antrochoanal polyp was removed. In addition, brownish, clay-like fungus ball hidden behind antrochoanal polyp was removed. The histopathology showed an antrochoanal polyp concomitant with a fungal ball.

#### RHPE-04

### A CASE OF TRANSIENT VISUAL DISTURBANCE AND OCULAR PARESIS AFTER ENDOSCOPIC SINUS SURGERY

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, HALLYM UNIVERSITY SACRED HEART HOSPITAL, HALLYM UNIVERSITY COLLEGE OF MEDICINE  
JI-SOO LEE, JOONG-SEOB LEE

40세 남자 환자가 수년전 부터 발생한 코막힘과 후각 감퇴를 주소로 내원하였다. 환자의 과거력상 Aspirin, NSAID에 알리지 병력이 있었다. 이학적 검사상 양측 중비도에 화농성 비루 소견과 함께 비용이 관찰되었다. CT 검사에서 전부비동의 연부조직음영이 관찰되어 양측만성비부비동염 및 비용종증으로 양측 내시경부비동수술을 계획 후 시행하였다. 2% lidocaine 및 1:1000 epinephrine 혼합 용액을 양측 접형구개동맥부위에 침윤주사 후 양측 비용절제술, 사골동절제술, 중비도개창술, 전두동개방술, 좌측접형동절제술을 시행하였다. 좌측 사골동 수술 중 지혈을 목적으로 보스민액을 묻힌 거즈를 수술부위에 두차례 패킹 후 즉시 제거하였다. 이후 Nasopore 패킹 후 수술 종료하였다. 수술 직후 회복실에서 좌안 동공 산대가 발견되고, 좌측 측방 주시 장애가 관찰되었다. 즉시 비강 내 패킹을 제거하였고 안과 협의 진료를 진행하였다. 협의 진료 중 좌측 동

공 산대가 점차 호전되었으며, 안압검사에서는 양측 정상으로 측정되었다. 20여분 의 경과관찰 중에 환자의 시력은 호전되었고 좌측 측방 주시가 서서히 회복되는 양상을 보였으며 이후 특이 경과 보이지 않고 수술 2일 차에 퇴원하였다. 본 저자들은 부비동내시경수술 중 일시적 안구 마비 및 시력저하를 경험하여 보고하는 바이다.

#### RHPE-05

### THE EFFECTIVENESS OF TNR NASAL MESH FOR THE CORRECTION OF CAUDAL SEPTAL DEVIATION

DEPARTMENT OF OTORHINOLARYNGOLOGY, KONYANG UNIVERSITY COLLEGE OF MEDICINE  
KI-IL LEE, JONG-YEUP KIM, HONG GEUN AN, SEUNG MIN IN

Septoplasty is one of the most common surgical procedures in rhinologic field. It is difficult to straight caudal septum and is mostly performed by external approach. Septal batten graft could be the powerful method to correct caudal septum. However, graft materials would be lack in most surgical field and also needed more surgical time for the harvest. Recently, several studies have reported the effectiveness of alloplastic implant such as polydioxanone(PDS) and polylactic-co-glycolic acid(PLGA) plate for septoplasty and rhinoplasty. TnR Nasal Mesh® is new bioabsorbable implant which is consisted of polycaprolactone(PCL). We report three cases of caudal septal correction with septal batten graft using TnR Nasal Mesh®. All surgical procedures were performed by endonasal septoplasty via bilateral flap elevation. Pre and post-operative analyses of Visual Analogue Scale were checked for subjective symptoms. The nasal patency by using acoustic rhinometry was also checked for objective findings. Patients showed subjective and objective improvement. We verify the effectiveness of TnR Nasal Mesh® for caudal septal

correction.

**RHPE-06**

**TWO CASES OF ORBITAL BLOWOUT FRACTURE WITH EXTRAOCULAR MUSCLES ENTRAPMENT**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHUNGBUK NATIONAL UNIVERSITY COLLEGE OF MEDICINE

MIN HYUCK KANG, WOO SUB SHIM, DONG WOOK LEE, YOUNG-SEOK CHOI, SEE-OK SHIN, HAHN JIN JUNG

안와 외향 골절은 외상에 의한 충격으로 안와내 압력이 상승되어 안와벽중에 서 약한 부위에 골절이 생겨 이 골절의 틈새로 안와내 연부 조직이 탈출, 또는 감돈되어 발생하는 질환이다. 최근 영상학적 진단 방법의 발전, 재건을 위한 인공 물질의 개발, 수술 기술 및 도구의 발전 등으로 상당히 심한 골절의 경우에도 훌륭한 수술 후 결과를 나타내는 경우가 많다. 하지만, 아직까지 안와 외향 골절의 수술 시기 및 적응증, 수술적 접근 방법, 그리고 이상적인 재건물에 대하여 논란이 많으며, 주로 술자의 경험 및 선호도에 따라 결정되는 경향이 있다. 최근 비내시경 기술의 발달로 안와 외향 골절 정복술이 이비인후과 영역에서 많이 시도되고 있으며, 안면부의 해부학적 구조에 익숙한 이비인후과 의사의 안면 외상 영역에서의 역할이 확대되고 있다. 본 두 증례는 안와 외향 골절에서 외안근의 감돈이 동반되어 안구 운동에 장애가 있었던 소아 환자에 대해 응급 수술을 시행한 증례이다.

**RHPE-07**

**PARTIAL EPIGLOTTCTOMY IMPROVES CPAP PARAMETERS IN THE PATIENT WITH EPIGLOTTIS COLLAPSE**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM

NATIONAL UNIVERSITY MEDICAL SCHOOL AND CHONNAM NATIONAL UNIVERSITY HOSPITAL, GWANGJU, SOUTH KOREA

SE-HYUN JEONG, HYUNG CHAE YANG, CHUNG MAN SUNG, HEE-YOUNG KIM, TAE GU KANG, SANG CHUL LIM

폐쇄성 수면무호흡은 수면중 상기도의 폐쇄로 인해 산소포화도가 떨어지는 질환이다. 상기도 폐쇄 원인은 사람마다 다르지만 1차적인 치료는 지속적 양압환기법 (Continuous positive airway pressure, CPAP)으로 알려져 있다. 하지만 최근 약물유발수면내시경의 시행과 함께 그 진단비율이 늘고 있는 후두덮개 폐쇄가 있는 환자에서는, CPAP 사용시 오히려 상기도폐쇄가 악화되는 경향이 있다. 이때 partial epiglottectomy를 시행하는 경우 후두덮개의 폐쇄를 해부학적으로 해결해 줄 수 있을 것으로 사료되며, 일부 보고들에서 partial epiglottectomy를 시행한 환자에서 수면무호흡 지수가 일부 호전된 것을 보고하기도 한다. 하지만 후두덮개 폐쇄를 보이는 환자들의 상당수는 후두덮개 이외 연구개나, 설기저부와 같은 다른 부위의 폐쇄를 동시에 지니고 있다. 따라서 후두덮개 수술만으로 수면무호흡을 완치할 수 없어, 후두덮개 수술이후 추가적인 양압기 사용이 요구되어 진다. 하지만 현재까지 partial epiglottectomy 시행 후 CPAP을 사용한 환자에서 CPAP 사용 parameter의 변화를 보고한 연구는 없다. 이에 본 연구에서는 2례의 증례 보고를 통해, 후두덮개 폐쇄 환자에서 partial epiglottectomy 수술전후 CPAP parameter의 변화를 비교해 보고, 이를 통해 이들 환자의 치료방법에 대해 고민해 보고자 한다.

**RHPE-08**

**5YEARS OLD MALE WITH VELOPHARYNGEAL STENOSIS**

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, SEOUL NATIONAL UNIVERSITY COLLEGE OF MEDICINE, SEOUL NATIONAL UNIVERSITY BUNDANG HOSPITAL

HYUN TAE RYU, JEONG WHUN KIM

A case of velopharyngeal stenosis after T&A(PITA). Introduction Velopharyngeal stenosis is one of post-operative complications after tonsillectomy and adenoidectomy. This report is to suggest one of successful treatment of this complication and also the shortcomings Case presentation 5 years old male underwent PITA surgery in August, 2018 and suffered from severe nasal obstruction, mouth breathing, and snoring. At the examination, there was severe adhesion between anterior pillar lower portion and tongue base, and also soft palate and posterior pharyngeal wall. The patient underwent revisional oronasopharyngoplasty surgery in Nov. 2018, and symptom seemed to improve, but only for short time. Nasopharyngeal adhesiolysis with cylindrical silastic sheet insertion was done in Feb. 2019, and improved symptom seemed to persist for long time, but just after the removal of silastic sheet, the symptom worsened.

## RHPE-09

### A CASE OF ETHMOID SINUS EWING SARCOMA WITH EXOPHTHALMOS IN A 21-YEAR-OLD MALE PATIENT

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CATHOLIC KWANDONG UNIVERSITY  
GUN HYUK LEE, SOYEON YOON, KEEJAE SONG

두개내에 발생하는 유잉 육종은 매우 드물게 발생하는 종양으로 내시경적 수술로 완전 절제 후 보조 항암 방사선을 시행한 치험 1례를 보고하는 바이다. 21세 남자 환자가 1주간의 좌측 안구돌출을 주소로 본원 안과에 내원하였다. 안와 전산화 단층 촬영 상 좌측 사골동 및 전두동을 점유하면서 좌측 안와내측으로 팽창하는 연부조직 음영이 관찰되어 본과 의뢰되었다. 내시경을 통한 이학적 검사 상 특이 소견은 관찰되지 않았으며, 부비동 자기 공명 촬영 상 전두동 입구부 및 지판으로 팽

창하는 양상의 불균일하게 조영 증강이 되는 사골동 기시 종양이 확인되었다. 이에 사골포를 깨고 조직 검사를 시행하였으며, 내부의 괴사성 조직을 동반한 소견이 관찰되었다. 면역 염색(vimentin, CD99, FLI-1 양성)을 통한 최종 보고 상 유잉 육종으로 확진되어, 내시경적 절제를 시행하였다. 수술 소견 상 종양은 후사골동 내측에서 기시하여 외측으로 팽창하는 형태를 보였으며 전방부로는 누골, 상부로는 전두동 입구부까지 성장한 소견을 보였다. 내시경적 절제술로 지판은 제거하였으며, 안와 골막의 침윤소견은 관찰되지 않아 골막은 보존하였다. 수술 후 5040cGy의 방사선 치료를 시행하였고, Ifosfamide, Etoposide(IE) 11 사이클, Vincristine, Actinomycin D, Cyclophosphamide 7 사이클 시행 후 현재 재발 없이 경과 관찰 중이다.

## RHPE-10

### A CASE OF SOLITARY FIBROUS TUMOR IN NASAL CAVITY

DEPARTMENT OF OTORHINOLARYNGOLOGY OF KEIMYUNG UNIVERSITY DONGSAN HOSPITAL

TAE WOO GIM, KI HO BAE, JUN WAN PARK, BON MIN KOO, JONG IN JEONG, DONG EUN KIM

고립성 섬유종은 간엽세포 기원의 방추세포 종양으로, 비강 및 부비동에서의 발생은 아주 드물게 보고되고 있다. 저자들은 비강 내 발생한 고립성 섬유종 1예를 경험하였기에 보고하고자 한다. 32세 여자가 수개월 간 지속된 비폐색을 주소로 내원하였다. 비내시경 검사상 좌측 비강 내 하비갑개 후부에서 비인두를 채우는 표면이 매끄럽고 붉은색을 띠는 종물이 관찰되었고, PNS CT 상 좌측 비강에 3cm 크기의 조영 증강되는 종괴가 확인되었다. 영상학적 판독 결과 혈관성 종양 의심 하에 수술적 절제술을 계획하였다. 수술 중 대량출혈 우려되어 술 전 영상의학과 협진 하에 좌측 악동맥의 원위부분지에 색전술을 시행하였다. 종양은 전신마취 하 비내시경을 이용하여 제거하였으며 수술소견 상 종양은 좌측 하비갑개 후반부에서 기원한 것으로 확인되어 하비갑개 후반부 일부와 종물의 완전 절제를 시행하였다.

종물은 경계가 명확하였고 크기는 2.5 x 3.0cm 였다. 병리조직 검사에서 방추세포가 풍부한 부분과 세포가 적고 섬유성 기질로 채워진 부분이 불규칙한 양상으로 관찰되었고, 사슴뿔 모양의 확장된 혈관들이 보였다. 면역조직화학 염색에서 CD34, STAT6에서 양성반응, desmin, smooth muscle actin에는 음성반응을 보였다. 최종 고립성 섬유종으로 진단되었고, 술 후 3일째 출혈 소견 없이 퇴원하였다. 환자는 수술 후 4개월째 합병증이나 재발 소견 없이 경과관찰 중이다.

## RHPE-11

## CAVERNOUS LYMPHANGIOMA IN THE MAXILLARY SINUS

DEPARTMENT OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL & CHONNAM NATIONAL UNIVERSITY HWASUN HOSPITAL

DONG HOON LEE, JONG MIN KIM, SE HYUN JUNG, HEE YOUNG KIM, SUNG MIN JIN, YOUNG YOON KIM, TAE MI YOON, JOON KYOO LEE, SANG CHUL LIM

Lymphangioma in the maxillary sinus is rare. Herein, we report an unusual case of cavernous lymphangioma, in the maxillary sinus, with imaging examinations. Clinicians should be aware of the possibility of lymphangioma in the maxillary sinus, and be capable of distinguishing it, from other benign cystic lesions.

## RHPE-12

## JUVENILE XANTHOGRANULOMA OF THE NASAL CAVITY AND RIGHT FOREARM

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, CHONNAM NATIONAL UNIVERSITY MEDICAL SCHOOL

HYE-BIN JANG, HYUNG-CHAE YANG

연소성 황색육아종은 주로 유아 및 소아에서 발견되는 양성 종양으로, 1905년 Adamson에 의해 최초로 기술되었으며, 당시 선천성 다형성 황색육아종으로 보고되었다. 가장 흔한 부위는 머리와 목 그리고 상반신이며, 이는 흔히 2세 이하에서 한 개의 홍색 혹은 황색의 피부 구진 및 결절의 형태로 나타난다. 드물게 이러한 피부 병변이 다발성으로 나타날 수 있으며, 황색 육아종 증례 중 5%에서 피부 이외의 곳에 나타나는 것으로 알려져 있다. 특히 저자들이 알기로 비강에 발생한 황색육아종은 국외 문헌에서 총 여섯 증례, 국내에서 두 증례로 매우 희귀한 편에 속한다. 국내에서는 2001년 비강과 고환에 동시에 발생한 증례가 보고된 바 있으며, 2006년 비강에 국한된 연소성 황색육아종이 보고된 바 있다. 이처럼 비강에 발생하는 연소성 황색육아종의 증례는 매우 적은 것으로 보여지며, 이에 저자들이 치험한 양측 비강과 우측 팔에 발생한 연소성 황색육아종 증례에 대해 보고하고자 한다.

## RHPE-13

## EPITHELIAL-MYOEPITHELIAL CARCINOMA ORIGINATING FROM A MINOR SALIVARY GLAND IN THE NASAL SEPTUM

DEPARTMENT OF OTORHINOLARYNGOLOGY, YONSEI UNIVERSITY WONJU COLLEGE OF MEDICINE, WONJU, SOUTH KOREA

HUI JOON YANG, YOUNG SUB LEE, SEUNG WON PAIK, HYUN JONG JEON, DONG-JOON PARK, CHI SANG HWANG

Epithelial-myoepithelial carcinoma is an extremely rare, malignant neoplasm that occurs most frequently in the major salivary glands and accounts for approximately 1% of all salivary gland neoplasms. Few reports have described the presence of epithelial-myoepithelial carcinoma in the sinonasal region; hence, the treatment guideline and prognosis remain unclear. Here we reported a case of a 75-year-old woman with complaint of nasal obstruction and frequent

epistaxis for 3 years. During the nasal endoscopic examination, a mass in the left nasal cavity originating from the left nasal septum that caused bleeding on touch was observed. The patient was treated by surgical removal of the septal mass using the endonasal endoscopic approach. A diagnosis of epithelial-myoepithelial carcinoma was made based on the features of histopathology and immunohistochemistry of the surgical specimens. In the serial follow-up paranasal sinus imaging and endoscopic inspection, evidence of recurrence was absent for 18 months after surgery. This report highlights a case of epithelial-myoepithelial carcinoma originating from a minor salivary gland in the nasal septum, one of the most unusual locations.

#### RHPE-14

### HUGE TORNWALDTS CYST WITH OTITIS MEDIA WITH EFFUSION

HUGE TORNWALDTS CYST WITH OTITIS MEDIA WITH EFFUSION

MYEONG SIN KANG, SEUNG YOON HAN, DONG HYUN KIM, JAE HOON LEE

Tornwaldt's cyst (TC) is a relatively rare lesion that is found in the posterior wall of the nasopharynx. It has an incidence of 3% in the adult population. It occurs in the midline bursa of the nasopharynx and represents a persistent communication between the roof of the nasopharynx and the notochordal remnants. Smaller cysts are usually asymptomatic. TC exceeding a diameter of 1–2 cm may be symptomatic. The three most common symptoms are postnasal discharge, occipital headache, and halitosis. Ear fullness and hearing loss may be caused by dysfunction of the eustachian tube, resulting in serous otitis media, secondary to inflammation or compression. We present a case of huge TC with otitis media with effusion.

#### RHPE-15

### TASTE DISORDER CAUSED BY VITAMIN B12 DEFICIENCY

DEPARTMENT OF OTORHINOLARYNGOLOGY, CATHOLIC UNIVERSITY OF DAEGU, SCHOOL OF MEDICINE

BYUNG-JUN KANG, SEUNG-HEON SHIN, MI-KYUNG YE

The etiologies of the changes in taste are multiple. It is rarely appreciated vitamin deficiency can impact taste function. Vitamin B12 deficiency can be caused by total gastrectomy or malnutrition. We treated fourteen patients with vitamin B12 deficiency induced taste disorders. The symptoms of patients were decreased taste sensitivity, tongue pain, and abnormal tongue sensation. The patients' tongues were red, smooth, and no papillae. The laboratory test showed that decreased serum concentration of vitamin B12. Taste function test showed increased taste thresholds. Ten patients had total gastrectomy history, four patients were poor nutritional status. All patients were treated by administration of vitamin B12 intramuscularly or orally. The patients' symptoms were improved after treatment. The appearance of the tongue and the results of taste testing were also improved. The patients with taste disorder and tongue pain should be asked about operation history including gastrectomy, vitamin B12 deficiency induced taste disorder should be considered in the differential diagnosis.

#### RHPE-16

### ASSESSMENT OF THE TEST-RETEST RELIABILITY OF LEVEL III POLYSOMNOGRAPHY: ARE THERE ANY PREDICTORS OF UNDERESTIMATION?

DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, INJE UNIVERSITY COLLEGE OF MEDICINE, ILSAN PAIK HOSPITAL

BYUNG-HYUN HAN, ICK-SOO CHOI

**목적:** The study of test–retest reliability and first night effect(FNE) of the sleep apnea test has been reported since 1981 to the present. In comparison, studies of portable sleep devices have been reported in very few cases to date. The purpose of this study is to investigate the test–retest reliability of level III devices, to examine the characteristics of patients with low reliability and to determine whether there are factors that can predict when retest is needed. **방법:** From April 2014 to March 2019, 74 patients were enrolled in this study. Apnea–Hypopnea Index(AHI), Apnea Index(AI), Hypopnea Index(HI), Average oxygen saturation and Lowest oxygen saturation were recorded through two nights. In addition, the Epworth sleepiness scale(ESS) and the subjective sleep score(SSS) of the patient was recorded. Two indicators were used to assess night to night variability. When the AHI difference was less than 10 and there is no change of severity between two nights, reliability was assessed. **결과:** Forty–two patients(56.76%) had an AHI difference of less than 10 but did not change their severity, and 13 patients(17.57%) had an AHI difference of 10 or more and had a severity change. Eight out of 74 patients(10.81%) were diagnosed at Night 2 but not at Night 1. In other words, about 11% of the subjects need retest. Based on the change in severity, ESS showed no statistically significant difference between the two groups, but SSS showed a statistically significant difference. **결론:** SSS were higher in no severity change group. This suggests that SSS should be considered first when deciding a retest. In about 23%, AHI differed by more than 10 in this study, also known as 15%–32% according to the literature of the level I test. This suggests that there is no significant difference in reliability between level I and III. Further studies should be conducted on the patients who need to be retested in order to reduce the patient's burden and to accurately diagnose and treat the disease.

RHPE-17

## CHARACTERISTICS OF ATYPICAL ORBITAL COMPLICATIONS OF SINUSITIS

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BOO-YOUNG KIM<sup>1</sup>, JEONGBEE JEON<sup>1</sup>, SEOUNGMIN LEE<sup>1</sup>, DOYEON KIM<sup>1</sup>, IL GYE LIM<sup>1</sup>, YOUNGKWON CHUNG<sup>2</sup>

**목적:** Orbital complications of rhinosinusitis in adults are scarcely discussed in the literature. The Objective is to review our experience with the management of atypical orbital complications of rhinosinusitis and to identify key factors in the characteristics and management of these patients. **방법:** Retrospective case series review from 2015 to 2019 in a tertiary referral center, which included all patients with rhinosinusitis and orbital complications. Severity of ophthalmologic complications, risk factors, clinical, imaging and microbiological data, and treatment outcomes. **결과:** Five patients were identified with atypical complications in the orbital area. Complications in two patients were associated with acute rhinosinusitis and three were associated with chronic rhinosinusitis. Two of five patients exhibited vision loss without any other symptoms. Two patients showed diplopia with or without ptosis. One patient had a headache and ptosis. Complete recovery was noted in four of five patients after endoscopic sinus surgery. Retinal thinning, delayed drainage, location of the sinusitis and culture results were prognostic factors of orbital complications in our cases. The recovery from diplopia was longer than that from vision loss. **결론:** Orbital complications are common in rhinosinusitis. However, atypical orbital complications are difficult to diagnose and manage

and may be facilitated by a review of atypical orbital complication cases. Case reviews of atypical cases can also yield vital information, such as prognostic factors. Fast decisions regarding drainage surgery, retinal evaluation, and microbial cultures were important factors for predicting the prognosis of patients with orbital complications.

## 포스터 전시(두경부)

08:00~15:10 • 컨퍼런스 홀

HNPE-01

### **A CASE OF COMPLETE RESECTION FOR LOCALLY ADVANCED PAPILLARY THYROID CARCINOMA INVADING LARYNGOPHARYNX AND CAROTID ARTERY THROUGH FREE FLAP RECONSTRUCTION AND CAROTID ARTERY BYPASS SURGERY**

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SEUNG-CHEOL HAN<sup>1</sup>, DOH-YOUNG LEE<sup>1</sup>, WOO-JIN JEONG<sup>1</sup>, EUN JAE CHUNG<sup>1</sup>, YOUNG HO JUNG<sup>1</sup>, SEONG KEUN KWON<sup>1</sup>, TACK-KYUN KWON<sup>1</sup>, SOON-HYUN AHN<sup>1</sup>, JAE WOONG CHOI<sup>2</sup>, WON-SHIK KIM<sup>1</sup>

**Introduction** Differentiated thyroid carcinomas (DTC) have good prognosis, and the mainstay of treatment is the complete surgical resection of involved thyroid gland. However, local invasion to adjacent structures by DTC is an important prognosticator and necessitates specific therapeutic procedures. In this report, we describe a patient with locally advanced PTC invading laryngopharynx and carotid artery. Case A 66-year-old female patient underwent total thyroidectomy with total laryngectomy, partial pharyngectomy, bilateral modified radical neck dissection, anterolateral thigh free flap reconstruction, and left carotid artery bypass surgery with Gore-Tex™ for advanced PTC (pT4b,

pN1b(10/55), M0 – AJCC 8th-stage: IVa). Although the patient had the PTC of 9.2 x 4.8 x 3.8 cm size locating at left lobe with extrathyroid extension invading left common carotid artery, trachea, esophagus and skin, complete resection could be done through free flap reconstruction and carotid bypass surgery. Conclusion In some cases of locally advanced thyroid carcinoma, especially with great vessel invasion, carotid bypass surgery and free flap reconstruction could be useful for the complete resection.

## HNPE-02

### BILATERAL PNEUMOTHORAX IN PATIENT WITH ANAPLASTIC THYROID CARCINOMA TREATED WITH LENVATINIB; A CASE REPORT

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HANA LEE, CHANG MYEON SONG, YONG BAE JI, KYUNG TAE

Anaplastic thyroid carcinoma (ATC) is the relatively rare malignancy of thyroid, and shows very poor prognosis. It presents with cervical lymph node metastasis in most patients, and more than 40% of patients have distant metastasis at the time of diagnosis. Lenvatinib, a multi-targeted tyrosine kinase inhibitor, is new drug that has antitumor effect on thyroid cancer including papillary and anaplastic cancer. Recently, we experienced a case of bilateral pneumothorax in a ATC patient with lung metastasis treated with Lenvatinib. Actually, only one case of pneumothorax during Lenvatinib treatment has been reported in the literature. Here, we discuss and report this case with the review of literature.

## HNPE-03

### 2 CASES OF INTRAORAL DERMOID CYST RESEMBLING PLUNGING RANULA

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BIN KWON, SEOK JIN HONG, IL-SEOK PARK, HEEJIN KIM

하마종은 주로 설하선에서 타액의 유출로 인해 발생한다. 본 병원에서는 기존의 검진 및 CT 소견에서 몰입성 하마종으로 진단되었다가 수술 후 유피낭종으로 진단된 2례를 경험하여 이에 소개하도록 한다. 36세 남자로서 15년 전부터 우측 악하 부위의 부종 관찰되던 환자로, 경부 CT 및 신체 검진 상 구강 저가 올라와있는 모습으로 몰입성 하마종 의심 되어 경화 치료 1차례 시행 받았다. 이후 크기 감소되는 듯하였으나, 시술 2년 뒤 다시 크기 증가되는 소견으로 내원하여 수술 원하여 수술 시행하였다. 수술 당시 구강 저 점막 절개 이후 두꺼운 캡슐을 가진 경계가 좋은 종괴 확인되었으며 구강으로 절제하였다. 이후 조직검사 상 유피 낭종으로 확인되었으며 술 후 환자는 1년 이상 다른 이상 소견 및 재발 없이 경과 관찰 중이다. 11세 남환으로 2주 전 갑자기 좌측 악하 부위 부종 발생하여 내원하였으며, CT 및 신체 검진 상 몰입성 하마종 의심 하에 전신 마취 하 설하선 절제술 계획하였다. 수술 시 점막 절개 후 경계가 확실한 두꺼운 캡슐을 가진 종괴 확인되어 입안으로 절제 시행하였다. 술 후 조직검사 상 표피낭종으로 확인되었다. 유피낭종 및 표피낭종은 선천적으로 혹은 후천적으로 발생할 수 있으며, 일반적으로 젊은 성인이나 30-40대에 많이 진단되며 설하에 발생되는 경우에 하마종을 비롯하여 림프관이형성, 유피종 등과 감별이 필요하다.

## HNPE-04

### ATYPICAL FIBROXANTHOMA

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## DONGHEUN PARK

Atypical fibroxanthoma, most complicated to discriminate between benign and malignancy, always hard to decide a treatment plan in clinical course. Borderline tumor that could be recur or metastasis in some manner, which it could be a disaster for patient's continuous life especially if patient is young. Additionally when the defect is placed on unusual part, surgeon could be in agony to decide a plan of surgical procedure. We report a case of a 24-year-old male patient who suspicious of hemangioma in right nasal vestibule, underwent surgical excision. However biopsy result came out as a suspicious atypical fibroxanthoma or pleomorphic dermal sarcoma which is borderline tumor that is hard to decide the definite position in wide pathological spectrum. Give a consideration to unusual place and young age, the patient underwent gingivobuccal approach and nasal reconstruction via gluteal dermo-fat graft and plan to do post operation radiation therapy. We report this case to introduce not well-known fibroxanthoma disease as well as reconstruction case on eccentric lesion that accompanied with in young patient.

## HNPE-05

## GIANT LOW-GRADE FIBROMYXOID SARCOMA IN THE NECK

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Low-grade fibromyxoid sarcoma (LGFS) is a rare, soft tissue tumor, and is of rare occurrence in the head

and neck region. It occurs mainly in the proximal extremities and trunk and is prevalent in the young and middle-aged adults. In the present case, LGFS was present at an atypical location and at an unusual age. The treatment of choice for LGFS is radical wide surgical excision with a clear margin. Long-term follow-up is essential for all patients with LGFS, as it has the potential for late recurrence or metastasis.

## HNPE-06

## PARAGANGLIOMA OF CAROTID BODY

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부신경절종은 부신 외에도 경동맥소체, 경정맥구, 미주 신경 등 다양한 위치에 생기는 드문 종양으로, 경동맥소체 부신경절종은 두경부에 생기는 부신경절종 중 가장 흔한 형태이다. 부신경절종은 카테콜아민 분비 여부에 따라 기능성, 비기능성으로 분류할 수 있으며 부신경절종의 10%는 양측성 혹은 다발성이며, 10%는 악성이며, 10%는 가족력이 있다. 경동맥소체 부신경절종의 진단은 증상, 신체검진, 영상의학적 검사뿐만 아니라 혈액 및 소변검사, 신경학적 검사, 핵의학검사를 통해 이루어지며, 크기와 위치, 기능을 정확히 파악한 후 치료를 계획해야 한다. 특히 수술이 필요하다면 수술 전에 풍선폐쇄검사, 색전술을 시행할 수 있다. 수술 후 혹은 수술을 하지 않는 경우에는 크기변화 등을 정기추적관찰할 수 있으며, 수술하기 어려운 경우 방사선치료를 고려할 수 있다. 첫 번째 제시된 증례는 무증상의 양측의 경동맥소체 부신경절종을 진단받은 36세 여자환자로 양측 종양의 크기가 증가하여 각각 수술 후 경과관찰 중인 증례이며, 두 번째 제시된 증례는 가족력이 없는 무증상의 일측의 경동맥 부신경절종을 진단받은 41세 여자환자로 색전술 없이 수술 후 경과관찰 중인 증례이다. 제시된 두 증례를 통해 크기, 위치, 검사결

과에 따른 부신경절종의 정 기추적검사, 수술적 절제를 선택하는 기준을 제시하는데 도움이 될 것으로 생각된다.

HNPE-07

**A CASE OF MULTIPLE POSTERIOR CERVICAL GANGLIONEUROMA IN ELDERLY PATIENT**

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Ganglioneuromas (GNs) are benign neurogenic tumors arising from ganglia of the sympathetic nervous system between age 10 and 40 years. They are mostly found at posterior mediastinum, retroperitoneum, and the adrenal gland, whereas only 2-5% occurred in the cervical lesion. GNs usually present as a single, painless and slow-growing mass, but multiple occurrences in the neck are extremely rare. An 80-year-old woman came to our clinic complained of posterior neck mass for 3 years. We performed surgical excision, and it was finally diagnosed as GN. We report the unique and rare disease entity with a brief literature review.

HNPE-08

**A CASE OF SUCCESSFULLY TREATED A MASSIVE CHYLE LEAKAGE AFTER ENDOSCOPIC MASS EXCISION VIA RETRO-AURICULAR APPROACH**

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SO-YOON LEE, SUNG SOO PARK, CHUNG SE WON, TEA HYUN SHIN

Presented here is a case of a chyle leak that developed following a left deep space lipoma excision that was successfully managed with conservative managements. A 26-year female patient who was nail artist complained lower neck mass. CT scan showed 6x6cm lipomatous lesion. It was positioned supraclavicular-, paravertebral-, and prevertebral component. A patient did not ruin her tattoo on the Lt. side neck. The mass was decided to remove via retro-auricular approach using endoscopic instruments. During surgery the mass was positioned under the branchial plexus. Multiple branches of lymphatic duct were ligated. Chyle leak was suspicious under the clavicle. From one day after the surgery, chylous discharge was increasing as massive as 500 ml/day. We promptly did multiple treatment and choices. 1. Local compression on the Lt. neck level IV, which thoracic duct was positioned was done. 2. Sandostatin (Octreotide) was injected. 3. NPO and intra-venous TPN were applied and then diet was change to mid-chain fatty acid diet (MCFA). 4. Stool loosener was applied. 5. Electrolytes and nutritional condition were checked regularly. Patient was discharged on the 30-day of operation without any complication.

HNPE-09

**TRANSORAL ENDOSCOPIC PARATHYROIDECTOMY VESTIBULAR APPROACH A CASE REPORT**

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JONG-HWAN LEE, YONG-TAE HONG, KI-HWAN HONG

Patients with primary hyperparathyroidism(PHPT) may present with clinical evidence of elevated serum calcium levels which include non-specific symptoms such as fatigue, pain and weakness as well as polydip-

sia, polyuria, and nephrolithiasis. Patients with symptomatic PHPT should have parathyroid surgery, which is the only definitive therapy. Parathyroidectomy is an effective therapy that cures the disease, decreases the risk of kidney stones, improves bone mineral density. We report our experience of a 67-year-old female patient with PHPT who presented with constipation, nephrolithiasis, osteoporosis, elevated serum calcium levels and successfully performed surgical treatment with transoral endoscopic parathyroidectomy vestibular approach (TOETVA). Postoperative biopsy revealed that the cause of the patient's PHPT was parathyroid adenoma, which was located on the superior pole of the left thyroid gland. The advantages TOETVA include its ability to afford equal access to both sides of the neck, the decreased tissue dissection required, and the excellent view of the anatomy provided, similar to an open approach. Further, it is the only approach that avoids any cutaneous scarring.

#### HNPE-10

### PRIMARY LARGE CELL NEUROENDOCRINE CARCINOMA OF THE SINONASAL CAVITY

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JI SEOB YOO<sup>1</sup>, YONG TAE HONG<sup>2</sup>, KI HWAN HONG<sup>3</sup>

Primary large-cell neuroendocrine carcinoma (LC-NEC) of the nose and paranasal sinuses is very rare and a distinct entity of paranasal carcinomas. Only a few reports are present in the English literature, and its treatment is not well established. We herein report a very rare case of primary large-cell carcinoma of the maxillary sinus, with an emphasis on immunohistochemical findings and treatment. This case of LCNEC

is that of a 75-year-old man with nasal obstruction with bloody discharges. Endoscopic biopsy identified it as LCNEC. Imaging modalities, including CT, MRI, and PET, did not reveal any tumors, including in the lung, other than the left nasal cavity tumor. Initially, we did a medial maxillectomy, but, at one year after the initial surgery, a left cheek mass was noted with painful swelling. Imaging revealed an infiltrative tumor (3 x 4 cm) in the left cheek without invasion into the left maxillary sinus. This lesion was also noted as LCNEC and treated with wide excision of the left maxilla and cheek. The present case is a large-cell carcinoma of the sinonasal cavity with comprehensive management and immunohistochemical evaluation.

#### HNPE-11

### A CASE OF MANDIBULAR RECONSTRUCTION WITH 3D-PRINTED TITANIUM IMPLANT AFTER MARGINAL MANDIBULECTOMY

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MIN KYU LEE, SEONG BIN PARK, MUN SOO HAN, YONG JUN JEONG, KANG HYEON LIM, KUK JIN NAM, JAE WOO JOO, KYUNG HO OH, SOON YOUNG KWON

The most commonly used techniques for reconstruction of the mandible in head and neck cancer are microvascular surgical techniques with free flap surgery. When the defect is large, the defect is reconstructed with vascularized bone-containing free flaps. By the way, there is additory technique using 3D-prefabricated titanium implant. We report a case of a 60-year-old male patient who was diagnosed with mandibular osteoradionecrosis. Under the diagnosis of floor of mouth cancer, he underwent surgical resection with adjuvant radiation therapy in 2018. Although there

was no recurrence, radiation-induced osteonecrosis occurred at left mandible after radiation therapy. After antibiotic therapy and surgical debridement, localized inflammation was controlled, and we planned surgical treatment. On July of 2019, the patient underwent left marginal mandibulectomy, and prefabricated titanium implant with fibula free flap was used for reconstruction. We report this case to introduce not well-known reconstruction technique. Prefabricated titanium reconstruction can be kept in consideration for patients with head and neck cancer.

## HNPE-12

### PEDIATRIC FOLLICULAR LYMPHOMA MIMICKING PAROTID NEOPLASM: A CASE REPORT

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JI-HYE HAN, YOON-SIK PARK, JU-HEE PARK

Pediatric follicular lymphoma (PFL) is a variant of follicular lymphoma (FL) that occurs in children and typically presents as a clonal follicular proliferation resulting in localized lymphadenopathy or extranodal lesions. We are reporting a case of pediatric follicular lymphoma which is mimicking parotid neoplasm. At preoperative phase, PFL of the parotid gland is mostly indistinguishable from other common parotid neoplasms. A 43-year-old man presented with asymptomatic and unilateral parotid swelling of an 1-month duration, slowly progressing in size. The patient underwent superficial parotidectomy and was diagnosed as PFL on final pathology and test of IgH gene rearrangement. The patient was tolerable without complication or recurrence.

## HNPE-13

### A CASE OF PEDIATRIC TYPE FOLLICULAR LYMPHOMA IN THE PAROTID GLAND

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HEE RYUNG KIM, CHANG MYEON SONG, YONG BAE JI, KYUNG TAE

Follicular lymphoma occurs mostly in male adults and is the 2nd most common type of non-Hodgkin lymphoma. However, pediatric type follicular lymphoma(PFL) is relatively rare and its incidence rate is approximately under 5% or less of pediatric lymphoma. PFL has distinctive characteristics compare to adult type follicular lymphoma. PFL mainly occurs in males and is likely to be localized to cervical lymph nodes and tonsils. However, extra nodal type PFL also can be occurred at the testis, epididymis, skin, gastrointestinal tract, parotid gland, and etc. Children with follicular lymphoma usually have limited stage disease, and the prognosis of PFL is better than adult type follicular lymphoma. Surgical excision of the lesion might be a good option, and majority of PFL cases show the complete remission after surgery. We encountered a case of pediatric-type follicular lymphoma at the parotid gland. A 12-year-old patient with right parotid mass underwent superficial parotidectomy and the pathologic result confirmed as PFL. Here, we report this case with the review of literature.

## HNPE-14

### METASTATIZING MIXED TUMOR OF THE PAROTID GLAND

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BYEONG JIN KIM, YONG TAE HONG, KI HWAN HONG

Pleomorphic adenoma is the most common neoplasm of the salivary gland usually a benign, slow-growing and well-circumscribed tumor. However, there are rare reports of a these benign tumors metastasizing to distant sites without undergoing malignant transformation. There are 3 distinct histologic types of malignant mixed tumor, carcinoma ex pleomorphic adenoma (carcinoma arising in benign mixed tumor), carcinosarcoma (true malignant mixed tumor) and metastasizing mixed tumor (MMT). Carcinoma ex pleomorphic adenoma is a most common malignant mixed tumor, but metastatic mixed tumor is an exceedingly rare tumor of the salivary gland. Metastatic mixed tumor has a paradoxical behavior with its benign histological features and its metastatic capacity. We report a rare case of multiple distant metastases originating from a histologically benign pleomorphic adenoma.

## HNPE-15

### HYPOGLOSSAL NERVE SCHWANNOMA IN THE MOUTH FLOOR MASQUERADING AS A RANULA

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HA NEUL LEE, SEUNG WON PAIK, HUI JOON YANG, JEONG PYO BONG, JI HOON KIM

Schwannomas are slow growing benign tumors originating from the myelin producing schwann cells in the peripheral nerves. In the head and neck area, vestibular schwannoma is the most common, whereas hypoglossal nerve schwannoma only represent 5% of non-vestibular schwannoma. Since the hypoglossal nerve is purely motor nerve, the incidence of the schwannoma is uncommon, and most of it occurs

in the intracranial portion. A 62-year-old woman visited our clinic for frequent submandibular swelling with or without food. CT scan revealed 3.8 x 1.9 cm size low density cystic mass in right sublingual space. The pre-operative radiological findings were consistent with a plunging ranula. During the surgery, solid round mass was found anterior to the lingual nerve extending inferiorly. It was attached to the hypoglossal nerve but excised with preservation of the nerve. Histopathological evaluation confirmed the diagnosis of schwannoma with Antoni areas A and B. Despite the rarity of schwannomas in the mouth floor, hypoglossal nerve schwannoma should be considered for sublingual cystic lesion.

## HNPE-16

### A CASE OF GIANT WARTHINS TUMOR INVOLVING RAPIDLY PROGRESSED PAROTID ABSCESS AND MEDIASTINITIS

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BEOM MO KOO<sup>1</sup>, SUNG HWAN LIM<sup>1</sup>, MIN A KIM<sup>2</sup>, SEUNG WOO KIM<sup>1</sup>

Warthin's tumor (WT) is second most common neoplasm in the parotid gland and it is often accompanied by various types of inflammation. The mediastinitis may present a rapid and fatal clinical course and secondary to a parotid abscess is extremely rare. An 81-year-old man came to emergency room complained of sudden enlarged left parotid mass and inflammatory symptoms around lateral neck and chest wall. We performed incision and drainage with adequate supportive treatments. He was finally diagnosed as abscess resulting from WT. We report the unique and instructive clinical report with literature review.

Withdrawal

## HNPE-17

**VOCAL FOLD PARALYSIS CAUSED BY ELONGATED STYLOID PROCESS (EAGLE'S SYNDROME)**

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YOUNG HO JUNG, YOUNG KANG, JEON SEONG, HYUNG DONG JO

Eagle's syndrome refers to a condition where an elongated styloid process or a calcified stylohyoid ligament causes oropharyngeal or anterolateral neck pain, dysphagia, or carotid compression. Abnormal elongation of the styloid process can be found in 4~7% of individuals, and while most are asymptomatic, only a fraction report symptoms. Diagnosis can be made upon physical examination by palpating the elongated styloid process, or radiologically, using computed tomography scan or magnetic resonance imaging. We report a case of a 46 year old male patient with a three month history of hoarseness. Physical examination showed left unilateral vocal fold palsy, with protrusion of styloid process at the left lingual tonsil area. Diagnosis was made via computed tomography scan, which showed bilateral elongation of the styloid process and left styloid process compressing the carotid space and the vagus nerve. Laryngeal electromyography revealed left high vagal palsy. The patient underwent surgical removal of the elongated styloid process and decompression of the carotid sheath. His left vocal cord mobility showed partial improvement, and his hoarseness gradually showed subjective improvement.

## HNPE-18

**CLINICAL APPLICATION OF LARYNGEAL ULTRASONOGRAPHY FOR THE TREATMENT OF PATIENTS WITH ADDUCTOR & ABDUCTOR SPAS-****MODIC DYSPHONIA: CASE REPORTS**<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY HEAD AND NECK SURGERY, COLLEGE OF MEDICINE, YEUNGNAM UNIVERSITY, <sup>2</sup>REGIONAL CENTER FOR RESPIRATORY DISEASES, YEUNGNAM UNIVERSITY MEDICAL CENTERSOO YEON JO<sup>1</sup>, JOON-HEE KIM<sup>1</sup>, TAE YEONG CHOI<sup>1</sup>, YOO SUN SONG<sup>1</sup>, HYUNG GYUN NA<sup>1</sup>, CHANG HOON BAE<sup>1</sup>, SI-YOUN SONG<sup>1</sup>, YONG-DAE KIM<sup>1,2</sup>, YOON SEOK CHOI<sup>1</sup>

Spasmodic dysphonia is a voice disorder characterized by involuntary spasm of intrinsic laryngeal muscles. Regarding the types, adductor spasmodic dysphonia accounts for 80~90% while abductor type affecting around 10~17% of individuals with spasmodic dysphonia. Though pathophysiology is known to be idiopathic. Injecting botulinum toxin into the affected laryngeal muscles thyroarytenoid (TA) and posterior cricoarytenoid(PCA) muscle respectively in adductor and abductor type, is regarded to be a therapeutic mainstay. Mostly, the procedure has been enacted by electromyography guidance. However, recently released reports of laryngeal ultrasonography (US) suggested its applicability in the clinical fields including EMG needle tracking, preoperative and postoperative assessment of vocal cord movement, detection of vocal cord palsy and vocal lesions in children. Thus, we tried to find the TA & PCA muscles by US. And we first successfully performed Botox injection into TA and PCA muscles under US guidance for the treatment of patients with spasmodic dysphonia. We concluded that US is a useful guiding instrument to visualize laryngeal intrinsic muscles for laryngeal Botox injection.

## HNPE-19

**A CASE OF LARYNGEAL GRANULAR CELL TUMOR**<sup>1</sup>DEPARTMENT OF OTORHINOLARYNGOLOGY-HEAD AND NECK SURGERY, <sup>2</sup>DEPARTMENT OF PATHOLOGY, BUNDANG

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Granular cell tumors (GCTs) are uncommon neoplasm. They can originate in any part of the body. The most common sites of origin are in the head and neck, while the larynx is a relatively uncommon location. We experienced a 25-year-old woman with a laryngeal granular cell tumor. She presented with foreign body sensation in her throat for 1 day. On endoscopic examination, a 1.0cm sized mass was present in the left arytenoid. She was treated by surgical resection under a fine dissection laryngomicroscope. Histopathologic examination confirmed the diagnosis of granular cell tumor. Clinical and endoscopic examination has shown no evidence of recurrence in the 3 months following surgery.

#### HNPE-20

#### ONLY CONTRALATERAL NECK METASTASIS WITH A WELL LATERALIZED PYRIFORM SINUS CANCER

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Lateralized pyriform sinus cancer has a higher incidence of ipsilateral neck node metastasis. pyriform sinus. Therefore, elective neck dissection of a clinically-negative neck in pyriform sinus cancer is widely accepted as standard treatment. Contralateral lymph node metastasis is significantly higher in patients with medial wall pyriform sinus cancers than in those with lateral wall pyriform sinuses. However, no subjects

have been reported with contralateral node metastasis only, without ipsilateral node metastasis. In the present case, the patient showed a well-lateralized pyriform sinus cancer without ipsilateral lymph node metastasis and only contralateral lymph node metastasis. This unusual case highlighted the importance of the differential behavior of the anatomic sites within the hypopharynx relative to the increased risk in the contralateral neck.

#### HNPE-21

#### A CASE OF LARGE CELL NEUROENDOCRINE CARCINOMA OF THE MAXILLARY SINUS

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Large cell neuroendocrine carcinoma is a rare epithelial neuroendocrine malignancy and is preferentially located in gastrointestinal tract and pancreas. Cases of large cell neuroendocrine carcinoma have been reported in many other locations, including the thymus, gallbladder, prostate, larynx, salivary glands, nasopharynx, tonsil and mastoid. However, primary sinonasal large cell neuroendocrine carcinoma never have been reported in Korea. We experienced a case of primary large cell neuroendocrine carcinoma arising from left maxillary sinus recently. A 82-year-old male patient presented with nasal obstruction and epistaxis. The biopsy revealed large cell neuroendocrine carcinoma with poor differentiation. After a general evaluation, the patient was staged as cT3N0M0. The patient was treated by combined radiotherapy and chemotherapy. We report this rare case with literature review.

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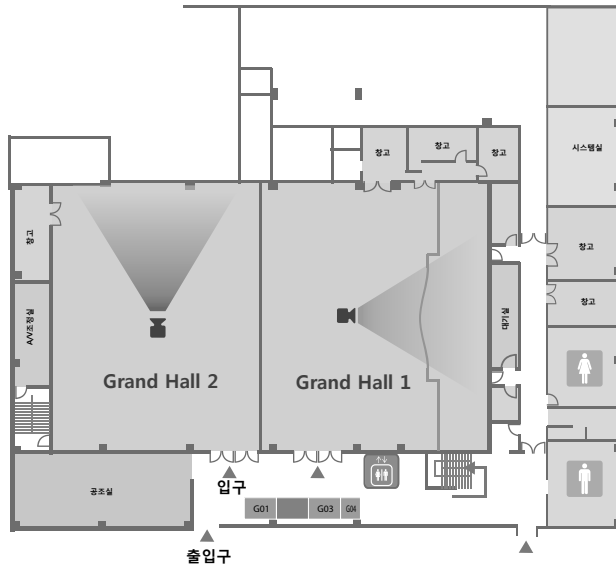
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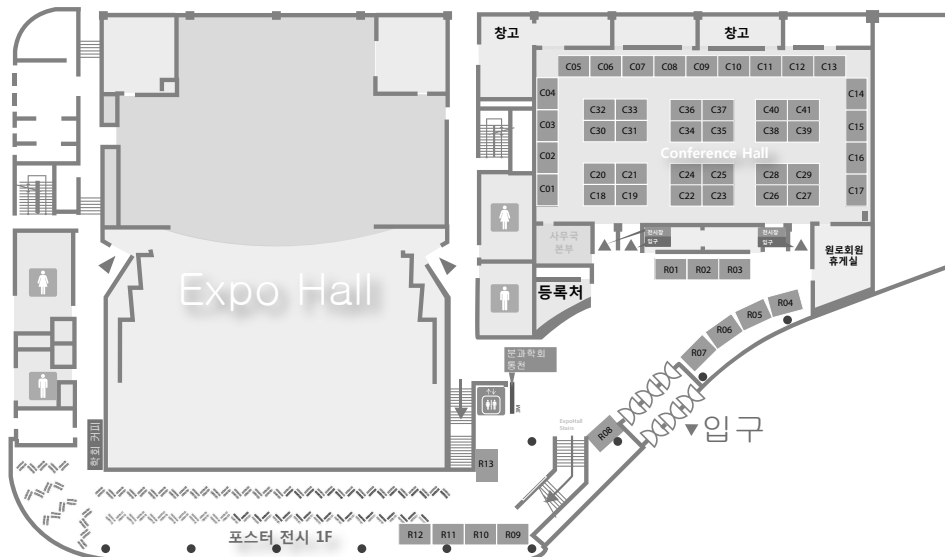
# 학술대회 안내도

## 1F Yeosu Expo Convention Center Grand Hall



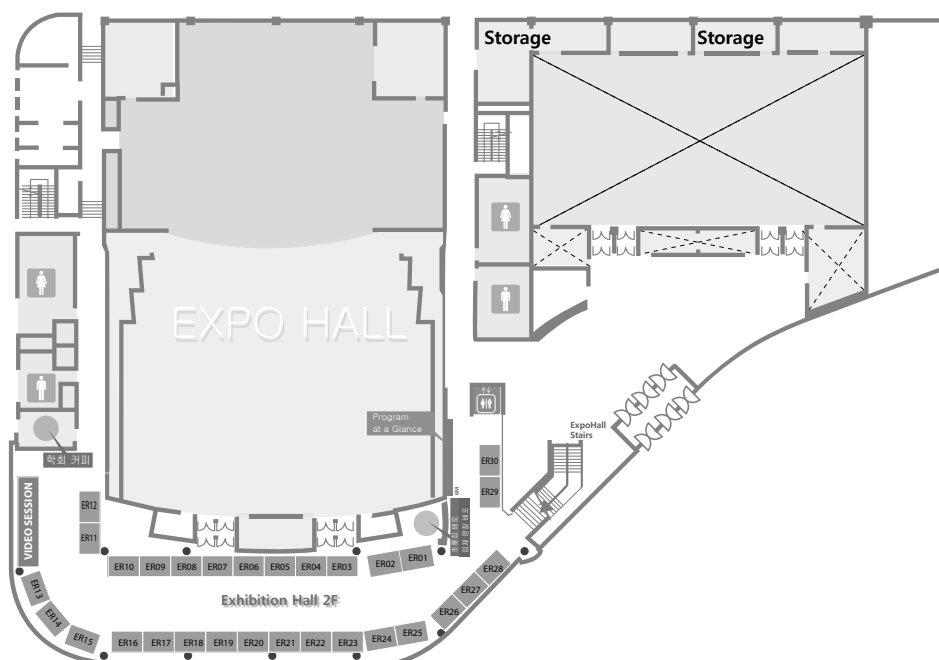
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박람회기념관	3F	야외테라스	
소회의실	2F	엑스포홀	동시통역실 에부제웨딩홀 식당
그랜드홀	1F	컨퍼런스홀	
	B1F	세미나실	

## 1F Yeosu Expo Convention Center Expo hall / Conference Hall

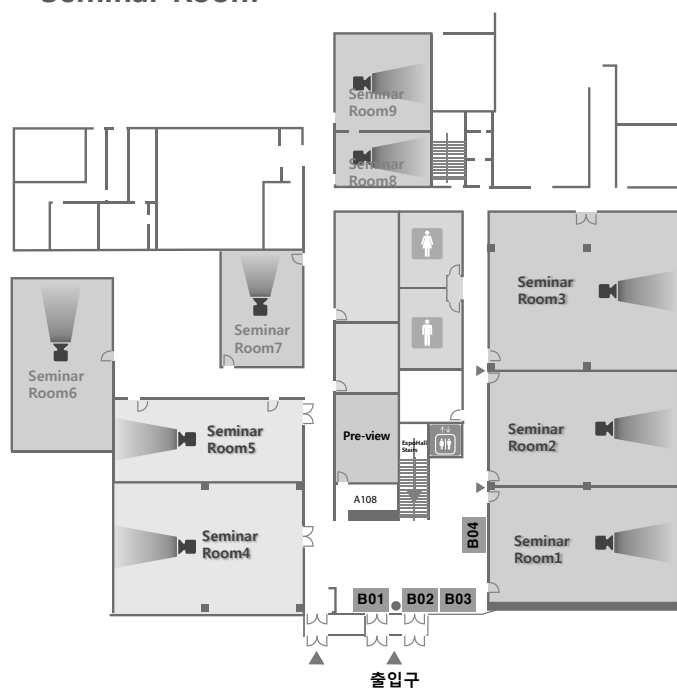


# 학술대회 안내도

## 2F Yeosu Expo Convention Center Expo Hall



## B1F Yeosu Expo Convention Center Seminar Room





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1	AB	26	소니코리아	52	중앙메딕스
2	GSK	27	스타키코리아	53	지에이코리아 에프씨파트너
3	MSD	28	써모피셔사이언티픽 코리아	54	지엔히어링코리아
4	SK케미칼	29	쓰리디메디비전 주식회사	55	참메드
5	건양대학교병원	30	아주대학교병원 개방형실험실	56	칼자이스
	의료기기중개임상시험지원센터	31	아주약품	57	코오롱제약
6	건인약품	32	아트메딕텍	58	코클리어 코리아
7	광우메딕스	33	안국약품	59	티앤알바이오팜
8	광우헬스케어	34	알보젠코리아	60	포낙
9	군자출판사	35	애보트	61	포유
10	다산청능재활연구원	36	에스엘메드	62	포인트닉스
11	다이지메디칼	37	에이치피앤씨	63	피셔앤파이크 헬스케어
12	대원제약	38	엠디팜	64	한결헬스케어
13	동구바이오제약	39	엠서클		(전남대학교병원 개방형실험실)
14	동산실업	40	오티콘코리아	65	한국보건산업진흥원
15	동아 ST	41	올림푸스	66	한국스트라이커
16	라이카코리아	42	유니반	67	한국유나이티드제약
17	레즈메드코리아	43	유니트론보청기	68	한국유니팜
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20	메델코리아	46	이노트로닉	71	한미헬스케어
21	메드트로닉 코리아	47	일동제약	72	한화제약
22	보령제약	48	일성신약	73	휴마시스
23	부광약품	49	제노레이	74	히어라이프
24	비브라운코리아	50	제일약품		
25	세종의학사	51	종근당		







