



Ajou University  
School of Medicine

DEPARTMENT  
OF

**O**TOLARYNGOLOGY

**2000 - 2001**  
ANNUAL REPORT



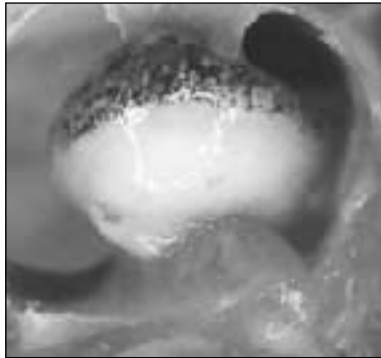


# OTOLARYNGOLOGY

## AJOU UNIVERSITY SCHOOL OF MEDICINE

### SUWON, KOREA

[Korean Language\(Click here\)](#)



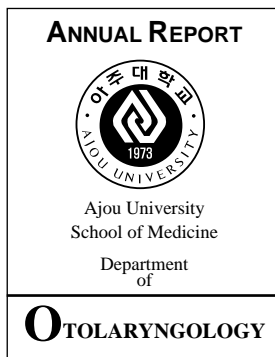
Experimentally Induced  
Cholesteatoma in the EAC  
of Mongolian Gerbil

#### Ajou Otolaryngology Symposium

The 7TH AJOU OTOLARYNGOLOGY SYMPOSIUM

NEW

#### Acoustic Neuroma Management



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Ajou University Hospital, Suwon, Korea

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Last Update : Mar 1, 2001

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First Departmental Homepage : April, 1997

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## INTRODUCTION

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This year the Korean Medical Society was facing a major conflict with the government. A nation-wide doctors' strike has been in effect to demand changes to the medical health care system. Aside from emergency rooms and intensive care units, the hospitals were at a complete standstill. Our country has never encountered such a situation in the past 50 years. It has started to affect many areas outside the medical community as well. The social atmosphere has also become very unflexible. All academic activities including classes at medical schools had been put on hold. We expected the conflict to have been settled by now but unfortunately, it looks as though the struggle may last longer than anticipated.

At this time, the Department has to adapt itself to suddenly changed circumstances to continue to expand and develop in order to offer excellent opportunities in service to the community, medical research, and education. It continues to take steps to enhance the Department's productivity.

Respectfully,

A handwritten signature in black ink, appearing to be 'Keehyun Park', written in a cursive style.

Keehyun Park, M.D., Ph.D.  
Chairman  
Department of Otolaryngology

## **PERSONNEL**

Roster  
Society Memberships, University and Hospital Committee  
Travel  
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## **RESEARCH**

Publications  
Abstracts  
Grants Received

## **EDUCATION**

Medical Students  
Residents  
Others  
Visiting Professors

## **PATIENT CARE**

## **FACILITIES AND EQUIPMENT**

# PERSONNEL

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## ROSTER

### Faculty

Keehyun Park, M.D. Professor and Chairman

M.D. Yonsei University, 1976.

Ph.D. Yonsei University, 1982.

Otology, Neurotology

E-mail : parkkh@madang.ajou.ac.kr

Hong-Joon Park, M.D. Associate Professor

M.D. Yonsei University, 1983.

Ph.D. Yonsei University, 1992.

Otology, Audiology

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Young-Myoung Chun, M.D. Associate Professor

M.D. Yonsei University, 1985.

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Otology, Neurotology & Skull Base Surgery

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Kyung Shik Suh, M.D. Assistant Professor

M.D. Yonsei University, 1986.

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Rhinology

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Head & Neck Oncology

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M.D. Pusan University, 1992.

M.S. Pusan University, 1999.

Head & Neck Oncology, Rhinology

Seong Kyun Kim, M.D. Instructor

M.D. Yonsei University, 1995.

M.S. Ajou University, 2000.

Rhinology

**Affiliated faculty**

Hee Yong Lee, M.D. Clinical Professor  
M.D. Yonsei University, 1967.  
Ph.D. Yonsei University, 1974.

Jeong Tai Kim, M.D. Clinical Professor  
M.D. Catholic University, 1969.  
Ph.D. Catholic University, 1997.

Joo-Ho Han, M.D. Clinical Professor  
M.D. Chosun University, 1976.  
Ph.D. Wonkwang University, 1996.

Soon Chul Huh, M.D. Clinical Professor  
M.D. Hanyang University, 1980.  
M.S. Hanyang University, 1987.

Hyung Bo Shim, M.D. Clinical Professor  
M.D. Chonnam University, 1980.

Jeong Bae Kim, M.D. Clinical Associate Prof.  
M.D. Chung-Ang University, 1981.  
Ph.D. Chung-Ang University, 1990.

Ho Sung Lim, M.D. Clinical Associate Prof.  
M.D. Yonsei University, 1983.  
M.S. Yonsei University, 1986.

Sung Woo Park, M.D. Clinical Assistant Prof.  
M.D. Korea University, 1986.  
Ph.D. Korea University, 1996.

Sun-Bok Song, M.D. Clinical Assistant Prof.  
M.D. Inje University, 1986.

Dong-Im Chang, M.D. Clinical Assistant Prof.  
M.D. Soonchunyang University, 1987.

Ju-Hyun Eum, M.D. Clinical Assistant Prof.  
M.D. Yonsei University, 1987.  
Ph.D. Ajou University, 2001.

Jee-Won Kang M.D. Clinical Assistant Prof.  
M.D. Yonsei University, 1989.  
Ph.D. Yonsei University, 2000.

Bong Ki Hong, M.D. Clinical Assistant Prof.  
M.D. Yonsei University, 1988.

Seong-Mo Koo, M.D. Clinical Assistant Prof.  
M.D. Yonsei University, 1990.  
M.S. Ajou University, 1997.

Sang-Joon Shin, M.D. Clinical Instructor  
M.D. Yonsei University, 1990.

**Residents**

## FOURTH YEAR

Yun Hoon Choung, M.D.,D.D.S.	D.D.S. Seoul National University, 1989 M.D. Ajou University, 1996
Byung-Chul Kim, M.D.	M.D. Ajou University, 1996
Jeong-Hoon Oh, M.D.	M.D. Chunbuk National University, 1996

## THIRD YEAR

Young Joon Yu, M.D.	M.D. Yonsei University, 1993
Jee-Churl Shin, M.D.	M.D. Yonsei Univ. Wonju College, 1994
Jung-Whan Song, M.D.	M.D. Ajou University, 1997

## SECOND YEAR

Ho Seok Choi, M.D.	M.D. Yonsei University, 1994
Seung-Koo Park, M.D.	M.D. Ajou University, 1998
Jeong-Min Chun, M.D.	M.D. Soonchunhyang University, 1996

## FIRST YEAR

Joon Ho Lee, M.D.	M.D. Yonsei Univ. Wonju College, 1996
Sang Jun Ryu, M.D.	M.D. Ajou University, 1999
Young Ju Kim, M.D.	M.D. Chunbuk National University, 1999

**Staff members in addition to faculty**

## NURSE

Young-Soon Park, R.N.

## NURSE AID

Eun-Young Cho  
Seon-Young Han  
Kyeong-Ae Choi  
Joo-Hee Han  
Yang-Soon Kim

## AUDIOLOGICAL LABORATORY

Jung-Hwa Lee, R.N.  
Hyoung Ah Mun

## VESTIBULAR LABORATORY

Mi-Yoo Koh

## VOCAL DYNAMIC &amp; SPEECH LABORATORY

Seo-Ji Ahn  
Hyun-Kyung Chung

## MOLECULAR BIOLOGY LABORATORY

Young-Sun Kim

## SECRETARY

Soo-Jin Na

**SOCIETY MEMBERSHIPS, UNIVERSITY & HOSPITAL COMMITTEE**Keehyun Park, M.D.

Korean Medical Association  
Korean Otolaryngological Society  
Korean Audiological Society, Trustee  
The Society of Korean Logopedics & Phoniatics  
International Association of Logopedics and Phoniatics  
Korean Society of Medical Education  
Korean Otology Study Group, Trustee & Director of Scientific Committee  
Korean Skull Base Surgery Society  
American Association for Research in Otolaryngology, International Committee, Member  
Japan Otological Society  
American Academy of Otolaryngology-Head and Neck Surgery  
Aeromedical Association of Korea, Trustee  
Review Board : Journal of Korean Otolaryngological Society  
Medical Fee Review Committee of National Federation of Medical Insurance  
Medical Staff Administration Committee of Medical School, Chair  
New Faculty Selection Committee of Medical School, Chair  
Tenure Faculty Selection Committee of Medical School  
Administration Committee of Medical School, Chair  
Administration Committee of Medical Center  
Academic Planning and Coordination Committee of Medical School, Chair  
Korean Medical School Dean Association

Hong-Joon Park, M.D.

Korean Medical Association  
Korean Otolaryngological Society  
Korean Audiological Society  
Korean Otology Study Group  
Korean Skull Base Surgery Society  
American Association for Research in Otolaryngology  
Sir Charles Bell Society  
Operation Room Committee of University Hospital  
Continuing Medical Education Committee of University Hospital  
Emergency Room Committee of University Hospital

Young-Myoung Chun, M.D.

Korean Medical Association  
Korean Otolaryngological Society  
Korean Audiological Society  
The Society of Korean Logopedics & Phoniatics  
The Korean Society for Head & Neck Oncology  
Korean Otology Study Group  
Korean Skull Base Surgery Society  
Asian-Oceanian Skull Base Society  
American Association for Research in Otolaryngology  
Vivarium Management Committee of Medical School  
Hospital Education and Training Committee

Kyung Shik Suh, M.D.

Korean Medical Association  
Korean Otolaryngological Society  
Korean Rhinological Society  
Korean Society of Allergology

Joong-Wha Koh, M.D.

Korean Medical Association  
Korean Otolaryngological Society  
Aeromedical Association of Korea  
The Society of Korean Logopedics & Phoniatics  
The Korean Society for Head & Neck Oncology  
Cancer Center Committee of University Hospital

Yang Hae-Dong, M.D.

Korean Medical Association  
Korean Otolaryngological Association  
The Society of Head & Neck Oncology  
Korean Head & Neck Surgery Study Group

Kim Seong Kyun, M.D.

Korean Medical Association  
Korean Otolaryngological Association  
Korean Rhinological Society

**TRAVEL**Keehyun Park, M.D.

- The 2nd Video Seminar on Otology and Neuro-otology  
(Stara Zagora, Bulgaria : May 19-20, 2000)
- Sofia University School of Medicine Visit  
(Sofia, Bulgaria : May 22, 2000)
- The 6th International Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 29-Jul 2, 2000)

Hong-Joon Park, M.D.

- The 8th Korea-Japan Meeting of Otorhinolaryngology Head and Neck Surgery  
(Kyoto, Japan: Apr 6-7, 2000)

Young-Myoung Chun, M.D.

- The 6th International Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 29-Jul 2, 2000)

Kyung Shik Suh, M.D.

- Visting fellow, Lab of Neuroscience, The Johns-Hopkins University School of Medicine  
(Baltimore, USA : Aug 1, 2000-Jul 28, 2001)

Joong-Wha Koh, M.D.

- 1st World Congress of Broncho - Esophagology  
(Yokohama, Japan : Jun 7-10, 2000)
- 5th International Conference on Head and Neck Cancer  
(San Francisco, USA : Jul 29-Aug 2, 2000)

Yang Hae-Dong, M.D.

- House Ear Institute Visit  
(L.A., U.S.A : Jun 12, 2000)
- The 33rd Head & Neck Cancer & Reconstructive Surgery Course  
(Iowa, U.S.A. : Jun 13-17, 2000)

Kim Seong Kyun, M.D.

- The 6th International Center for Otologic Training  
(Savannah, Georgia, U.S.A. : Apr 29-May 13, 2000)

## PRESENTATION

### Keehyun Park, M.D.

- The 6th Korean Combined Otolaryngological Congress  
(Chunahn : Apr 21-22, 2000)  
“Congenital middle ear cholesteatoma : a clinical and histopathological review”  
“Hearing improvement by intravenous therapy of Ginkgo-extract on sudden deafness”  
“Stapes footplate fistula and recurrent meningitis”
- The 2nd Video Seminar on Otology and Neuro-otology  
(Stara Zagora, Bulgaria : May 19-20, 2000)  
“Hyperproliferation of experimental cholesteatoma”  
“Inner ear anomaly with CSF leakage”
- The 6th International Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 29-Jul 2, 2000)  
“Signal transduction pathway in experimental cholesteatoma using Mongolian gerbils”

### Hong-Joon Park, M.D.

- The 8th Korea-Japan Meeting of Otorhinolaryngology Head and Neck Surgery  
(Kyoto, Japan: Apr 6-7, 2000)  
“Connexin 26 mutation associated with Korean non-syndromic hearing loss”

### Young-Myoung Chun, M.D.

- The 6th Korean Combined Otolaryngological Congress  
(Chunahn : Apr 21-22, 2000)  
“Functional middle ear surgery”  
“Clinical analysis of treatment for children with OME using Paparella ventilation tube type I and type II”
- The 6th Interantional Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 29-Jul 2, 2000)  
“Functional middle ear surgery for management of retraction pocket & cholesteatoma : short-term report”  
“Cholesteatoma : reversible or irreverisble”
- The 6th Ajou Otology Symposium  
(Suwon: Jun 17, 2000)  
“What is the role of infection in otitis media”  
“Vaccination for OM treatment”

Kyung Shik Suh, M.D.

- The 6th Korean Combined Otolaryngological Congress  
(Chunahn : Apr 21-22, 2000)  
“Evaluation of antibiotic susceptibility in pediatric sinusitis”  
“Effect of septoplasty and inferior turbinectomy”
- The 6th Ajou Otology Symposium  
(Suwon: Jun 17, 2000)  
“Microbiology in otitis media & sinusitis”

Joong-Wha Koh, M.D.

- 6th Korean Combined Otolaryngological Congress  
(Chunahn: Apr 21-22, 2000)  
“ Neoadjuvant chemotherapy followed by concurrent chemoradiotherapy in locally advanced nasopharyngeal carcinoma”  
“ A case of rhinomaxillary mucormycosis”
- 5th International Conference on Head and Neck Cancer  
(San Francisco, USA : Jul 29 - Aug 2, 2000)  
“Analysis of lymph nodes according to various modification of neck dissection in head and neck cancer”

## RESEARCH

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Departmental research activities are always a source of pride among the faculty. Research in the Department of Otolaryngology continues to grow with investigations, which include both basic and clinical, interdepartmental and interdisciplinary research.

For the time being, the major research area in our Department is in otology, especially middle ear cholesteatoma, genetic hearing loss & otitis media.

## PUBLICATIONS

- Park HJ, Hahn SH, Chun YM, Park K, Kim HN : Connexin 26 mutations associated with non-syndromic hearing loss. *Laryngoscope* 110(9) : 1535-1538, 2000
- Park K, Lee YD, Park HJ, Chun YM : Epithelial differentiation in developing murine eustachian tube and middle ear. *Otolaryngol Head Neck Surg* 122(6) : 902-907, 2000
- Park K, Lee WS : Decision analysis for early diagnosis of small acoustic neuroma. In: *Acoustic neuroma and other CPA tumors. Third International Conference.* Sanna M (eds). Rome, Monduzzi Editore, pp.99-107, 1999
- Park K : Inner ear anomaly with CSF leakage. In : *Seminar on otology and neuro-otology. 2nd Videoseminar Stara Zagora, Dimov et al (eds).* Stara Zagora, Thracian University Press, pp.25-28, 2000
- Park K : Hyperproliferation of experimental cholesteatoma. In : *Seminar on otology and neuro-otology. 2nd Videoseminar Stara Zagora, Dimov et al (eds).* Stara Zagora, Thracian University Press, pp.91-94, 2000
- Lim DJ, Chun YM, Lee HY, Moon SK, Chang KH, Li JD, Andalibi A : Cell biology of tubotympanum in relation to pathogenesis of otitis media - a review. *Vaccine* 19: S17-S25, 2000
- Park K, Park HJ, Chun YM, Choung YH : The significance of T2-weighted, fast-spin echo magnetic resonance imaging scan in a screening test for patients with acoustic tumor. *Korean J Otolaryngol* 43(3) : 265-271, 2000
- Koh JW, Shin JC, Kim HZ, Park SK : Clinical significance of preoperative studies in diagnosis of thyroid nodule - FNAC, ultrasonography, computed tomography. *Korean J Otolaryngol* 43(3) : 323-328, 2000
- Park HJ, Park K, Song JW, Choung YH, Choi HS : Molecular genetic analysis of connexin 26 in Korean congenital hearing loss. *Korean J Otolaryngol* 43(4) : 357-362, 2000
- Koh JW, Choung YH, Park CH, Pai MS, Yang HD, Chun JM : F-18-FDG imaging using dual-head coincidence positron emission tomography in patients with head and neck cancer. *Korean J Otolaryngol* 43(6) : 649-654, 2000

- Koh JW, Yang HD, Song JH, Choi HS : Analysis of lymph nodes number according to various modification of neck dissection. Korean J Otolaryngol 43(8) : 862-865, 2000
- Park HJ, Park K, Kim BC, Yoo YJ, Park SK : Detection of bacteria in the middle ear effusion and adenoid tissue of patients with chronic otitis media using PCR method. Korean J Otolaryngol 43:913-917, 2000
- Kim HN, Kim SG, Lee HK, Ohrr H, Moon SK, Chi J, Lee EH, Park K : Incidence of presbycusis of Korean populations in Seoul, Kyunggi and Kangwon Provinces. J Korean Med Sci 15:580-584, 2000
- Park K, Park HJ, Chun YM, Shin JC : Hearing improvement by intravenous therapy of Ginkgo-extract on sudden deafness. Korean J Audiol 3:160-165, 1999
- Koh JW, Ahn SJ, Yang HD, Kim BC, Shin JC : Effect of frenulotomy in tongue-tie: focused on alveolar sounds. J Korean Logopedic Phoniatric 11(1) : 5-11, 2000
- Park K, Chun YM, Choung YH, Kim Y, Cho KG : Clinical analysis of 25 cases of acoustic neuroma for the last five years. J Clin Otolaryngol 11(2):241-248, 2000
- Park K, Yang HD, Chun YM, Park HJ : Congenital middle ear cholesteatoma : a clinical and gross pathological review. J Clin Otolaryngol 11(2) : 249-255, 2000
- Chun GR, Choi BJ, Pai KS, Koh JW, Chun YM, Lee SY : Clinical evaluation of foreign body aspiration in pediatric patients. Korean J Ped Allergy 10(3) : 225-232, 2000
- Kim S, Park CH, Park K : CSF rhinorrhea due to congenital defect of stapes mimicking otorrhea ; radionuclide cisternographic finding. Clin Nuclear Med 25: 634-635, 2000
- Lee WS, Choi JY, Yang HD, Cho CH, Kim IS : Mastoid obliteration with bone paste and fat. Korean J Otolaryngol 44(1) : 26-31, 2001
- Koh JW, Yang HD, Chun JM, Lee JH : A case of localized amyloidosis of tonsil. Korean J Otolaryngol 44(2) : 215-217, 2001

## ABSTRACTS

### 1. International Meeting

- The 8th Korea-Japan Meeting of Otorhinolaryngology Head and Neck Surgery (Kyoto, Japan: Apr 6-7, 2000)

#### **“Connexin 26 mutations associated with non-syndromic hearing loss”**

Objective: Mutations in the GJB2 gene are a major cause of autosomal recessive and sporadic types of congenital deafness. The 35delG mutation is the most frequent type of mutation in white population. However, several other forms were reported, such as 167delT among Ashkenazi Jews and R143W in Africans. The present study investigated the mutations of connexin 26 (Cx 26) found in patients with nonsyndromic hearing loss (NSHL) and newborns in the Korean population. Study Design: The sequencing data for 147 unrelated patients with congenital NSHL and 100 audiotically screened newborns were included in this prospective study. Methods: Genomic DNA samples from all patients and newborns were sequenced in both directions for detection of Cx26 mutations. Results: Thirteen different types of mutations were found in the patients and newborns. V27I and E114G are the popular type of polymorphic mutations in both groups. 235delC-deletion and frameshift -was detected in patients (15 in 294 alleles) and newborns (1 in 200 alleles). 35delG was rarely found in both group. In addition to above mutations, several types of mutations -S85P, K41R, S72C, V84A, 176-191del, and 299-300del-were identified. The family study of the 235delC showed a typical autosomal recessive trait of NSHL in their audiological evaluation of hearing threshold. Conclusion: The frequency of 235delC allele showed much higher in the patients (5%) than in newborns (0.5%). We rarely found 35delC mutant in both groups. These results suggest that the different types of Cx26 mutations affect autosomal recessive NSHL according to ethnic background.

- The 2nd Video Seminar on Otology and Neuro-otology (Stara Zagora, Bulgaria : May 19-20, 2000)

#### **“Inner ear anomaly with CSF leakage”**

Anomaly of the inner ear is associated with varying degrees of hearing impairment. There is also a risk of fistulous communication between the subarachnoid space and the middle ear cavity in some cases that are presented as cerebrospinal fluid otorrhoea followed by recurrent attacks of meningitis.

A 13-year-old boy with sensorineural hearing loss of the left ear was presented with watery rhinorrhea. He had two episodes of bacterial meningitis. RN cisternography using Tc-99m-DTPA depicted abnormal radioactivity in the region of the left ear suggesting CSF otorrhea. High resolution CT scans of his temporal bone revealed severe cochlear dysplasia of the left ear.

Surgery revealed common cavity anomaly of the left inner ear with CSF leakage into the middle ear through the perilymph fistula which was repaired successfully through translabyrinthine approach. The patient is doing well and has no rhinorrhea or recurrent attacks of meningitis.

### **“Hyperproliferation of experimental cholesteatoma”**

In this study, we induced canal ligation cholesteatoma using Mongolian gerbils and investigated the hyperproliferative nature of canal ligation cholesteatoma by using immunohistochemical technique with proliferation markers(cytokeratin 13/16, PCNA, EGFR, thrombomodulin, PLC- $\gamma$ 1, PI3K) and western blot analysis(EGFR, PLC- $\gamma$ 1,PI3K).

In this result, canal ligation cholesteatoma showed more intense localization of cytokeratin 13/16, PCNA, EGFR, thrombomodulin, PLC- $\gamma$ 1 and PI3K proteins than controls on immunohistochemistry. By western blot analysis, considerable higher levels of EGFR, PLC- $\gamma$ 1 and PI3K protein were detectable in canal ligation cholesteatoma. This result will provide a good morphological basis for future cholesteatoma animal research concerning the pathogenesis of cholesteatoma.

- The 6th International Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 29 - Jul 2, 2000)

### **“Signal transduction pathway in experimental cholesteatoma using Mongolian gerbils”**

Cholesteatoma is characterized by the presence of a keratinizing epithelium that is believed to have hyperproliferative nature. Several laboratory animals have been used to model cholesteatoma formation to provide new information on cellular proliferation. The proliferation and differentiation of cell in specialized tissues and expression of their properties are under the control of a large number of regulatory processes and complex interactions called signal transduction. Signal transduction pathway may be initiated by external signals such as growth factors, which bind to receptors and activate tyrosine kinases in the plasma membrane. These kinases activate phospholipase C- $\gamma$ 1(PLC- $\gamma$ 1)protein, which in turn stimulates a downstream switch kinases to initiate transcriptional activation of genes in the nuclei of keratinocytes.

The purpose of this study is to elucidate the distribution of epidermal growth factor receptor(EGFR), phosphatidylinositol 3 kinase (PI3K), and PLC- $\gamma$ 1 in deep meatal skin, retroauricular skin and cholesteatoma matrix of experimental animals. In this study, we induced canal ligation cholesteatoma using Mongolian gerbils and investigated the expression of EGFR, PI3K, and PLC- $\gamma$ 1 in this model by using western blot analysis and immunohistochemistry. By western blot analysis, considerably higher levels of EGFR, PI3K and PLC- $\gamma$ 1 proteins were detectable in experimental cholesteatoma. On immunohistochemistry, experimental cholesteatoma showed more intense localization of EGFR, PI3K and PLC- $\gamma$ 1 proteins than deep meatal skins and retroauricular skins.

In conclusion, overexpression of EGFR, PI3K, and PLC- $\gamma$ 1 may contribute to abnormal proliferation and differentiation of experimental cholesteatoma in Mongolian gerbils. So this animal model can be used for the future study of cellular proliferation of cholesteatoma.

#### **“Cholesteatoma : reversible or irreversible”**

The clinical characteristics, such as invasion, migration, uncoordinated proliferation, altered differentiation, may arise as a result of defective wound healing process, or the induction of preneoplastic transformation or genetic alteration.

To date, a number of the genes have been shown to be differentially regulated in cholesteatoma, which might be responsible for these clinical characteristics. However, it is still unclear whether these phenomena may only be overt when cholesteatoma is under specific conditions such as inflammation and infection etc. If these genetic alterations in the development of cholesteatoma may be transient, the pathology of cholesteatoma may be reversible disease. In fact, this reversibility of cholesteatoma could be not infrequently experienced in patients with ear canal cholesteatoma.

We hypothesize that once cholesteatoma is in normal environment, the cellular or molecular pathology of cholesteatoma may be able to return to normal epidermal characteristics. The aim of this study was to determine whether the hyperproliferation and altered differentiation of cholesteatoma are reversible or not. For this purpose, we used experimental cholesteatoma model induced in gerbils by canal ligation. Although the process of the development of cholesteatoma in this model are different from human middle ear cholesteatoma, the resultant cellular and molecular pathology have been well documented as identical as in the latter. After induction of aural cholesteatoma, ligations were removed and keratin debris was evacuated.

Then adequate ventilation was maintained until grossly normal appearance. Using several proliferation and differentiation markers, we examined how different between these treated skin and untreated cholesteatomatous skin. None of our data showed that there were any obvious differences between them. These suggest the altered differentiation and uncoordinated proliferation of induced cholesteatoma may be reversible to be normal.

We will here discuss in detail.

### **“Functional middle ear surgery” for management of retraction pocket & cholesteatoma : short-term report”**

While the incidence of extensive or complicated cholesteatoma has dramatically decreased for the last decades, the early staged or less extensive cholesteatoma and retraction pockets are more frequently found. Especially localized adhesive otitis media, usually in the posterior tympanic membrane, is one of the most difficult dilemmas for the otologist.

There are several controversial issues for managing patients with these types of otitis media: 1) conservative care or surgical treatment; 2) which techniques of surgery; 3) whether or not mastoidectomy. We propose a strategy, so-called “functional middle ear surgery (FMES) for the management of types of retraction pockets (RP) and early cholesteatoma (CH). FMES was based on safe marsupialization of RP or CH, mucosal preservation, the adequate ventilation, and prevention of RP. In case of attic RP or CH, atticotomy with scutumplasty was made. On the other hand, the procedure to remove posterior annular bone and posterior scutum to allow access tympanic sinus and posterior attic space (designated as “posterior sinusectomy”) with reconstruction were applied to sinus RP or CH. Early tensa cholesteatoma would be managed as the combination of atticotomy and posterior sinusectomy. If the disease seems to extend to mastoid, endoscopes were introduced transmeatally or transcortically. If cholesteatoma extensively occupied in mastoid, complete mastoidectomy was made. However, other inactive pathologic conditions such as effusion, cholesterol granuloma, and granulation etc. would be managed as endoscopic removal or minimal mastoidectomy. Over a period of 4 years, 50 primary procedures based on FMES were performed for these diseases. We will discuss the achievements providing safe dry ear and minimal care to the patients by using this strategy as well as its limitation.

- The 5th International Conference on Head and Neck Cancer  
(San Francisco, USA: Jul 29-Aug 2, 2000)

### **“Analysis of lymph nodes number according to various modification of neck dissection in head and neck cancer”**

Background and Purpose : The type of neck dissection performed for head and neck cancers depends on the experience of the surgeon and the status of the neck metastasis. The purpose of this study was to quantify the extent of lymphadenectomy achieved according to the various modification of neck dissection based on microscopic pathologic analysis and to analyze the difference among the types of neck dissection. Materials and Method : Charts and pathologic reports in patients who underwent neck dissection from June 1994 to October 1999 were reviewed. Patients who received selective neck dissection or preoperative radiotherapy to the neck were excluded. The samples were 65 cases and then divided four groups : radical neck

dissection (group 1), Type 1 modified radical neck dissection (Type 1 MRND by Medina' s classification, group 2), Type 2 MRND (group 3), Type 3 MRND (group 4). The number of lymph nodes counted by pathologic microscopic examination for each regions of specimens was recorded. Intergroup difference was analyzed by one-way between-group analysis of variance (ANOVA). Results : The mean number of dissected lymph nodes per specimen was 43.6 in group 1, 38.8 in group 2 and 3, 30.3 in group 4. Group 4 significantly differed from group 1 ( $p<0.05$ ). The number of dissected lymph nodes from level II, III, IV of group 4 was significantly different from that of group 1 ( $p<0.05$ ). There was no significant difference among the other groups. Conclusions : The number of dissected lymph nodes decreases as the number of preserved non-lymphatic tissue structures increases and level II, III, IV are less complete regions in functional neck dissection. In functional neck dissection, need more concern for the prevention of possible missed, non-resected lymph nodes.

## 2. Domestic Meeting

- The 6th Korean Combined Otolaryngological Congress  
(Chunahn : Apr 21-22, 2000)

“Congenital middle ear cholesteatoma : a clinical and histopathological review”

“Hearing improvement by intravenous therapy of Ginkgo-extract on sudden deafness”

“Stapes footplate fistula and recurrent meningitis”

“Functional middle ear surgery”

“Clinical analysis of treatment for children with OME using Paparella ventilation tube type I and type II ”

“Evaluation of antibiotic susceptibility in pediatric sinusitis”

“Effect of septoplasty and inferior turbinectomy”

“Neoadjuvant chemotherapy follwed by concurrent chemoradiotherapy in locally advanced nasopharyngeal carcinoma”

“A case of rhinomaxillary mucormycosis “

- The 6th Ajou Otology Symposium  
(Suwon: June 17, 2000)

“What is the role of infection in otitis media”

“Vaccination for OM treatment”

“Microbiology in OM & sinusitis”

## GRANTS RECEIVED

- Molecular genetic characterization of hereditary hearing loss in Korea, funded by KAIST
- The establishment & characterization of in vitro model of human middle ear cholesteatoma, funded by Department of Medical Sciences The Graduate School, Ajou University

## EDUCATION

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Education activities in the Department involve basic student education, post-M.D. residency education and faculty participation in continuing educational programs both local and national.

Medical student education according to the curriculum and manual, classroom lectures up to 5th year are given using the symptom-oriented-disease approach and special behavioral objects (one semester - 30 hours). After completion of lectures, during 1 week, we contact medical students(5th grade) with clerkship. Basic physical examination and other diagnostic and therapeutic procedures are reviewed through the training period.

The residency program includes clinical practicum, instructional and research experiences. Also, we invite some professors of the other universities to present useful and upmost lectures. The academic schedule for resident doctors is as follows:

Textbook Review : Provides an opportunity for first-year residents to read, review, and discuss selected chapters from a major textbook in Otolaryngology. Anatomy, Physiology and Pathology are stressed in the selection of material. Textbook review usually meets every weekly morning (7:30-8:30 AM) except Saturday.

Journal Club : Review current literature in Otology, Rhinology, Laryngology, Head & Neck Oncology, Neurotology and Skull base surgery. Journal Club usually meets every Monday evening 8:00-9:00 PM.

Case Conference : Opportunity to discuss interesting or/and problem cases with Radiologist, Pathologist and any other related department doctors. Case Conference usually meets every Monday evening 6:00-7:00 PM.

Case Preview : Gives the resident a thorough understanding of the disease and decision-making process for treatment by analyzing cases. Case Preview usually meets every Monday evening 5:00-6:00 PM.

Case Review : Provides postoperative analysis of the total cases performed during last week. Case Review usually meets every Monday evening 7:00-8:00 PM.

Topic Review : Allows the residents to prepare interesting and important topics by themselves to improve their presentation ability, and to help them to care for patients. Topic Review usually meets every Thursday evening 5:00-6:00 PM.

Special Lecture : Faculty members of the Department have the chance to give lecture on their specialty to the residents. Sometimes doctors or professors from another university or institute are invited to give special lecture. This usually meets the first Saturday morning 7:30-8:30 AM of the month.

Head and Neck Tumor Conference : Provides an opportunity to review, discuss, and decide treatment plan of H&N cancer patients with Oncologist, Radiotherapist, Radiologist, Plastic surgeon, Dentist and General surgeon. This usually meets third Tuesday evening 5:30-6:30 PM.

ENT Practitioner Meeting : Provides local practitioner with opportunity to obtain advises from colleagues on difficult cases, share clinical pearls and the state-of-the-art in ENT fields. This usually meet the 3rd Saturday morning 7:30-8:30 AM of the months.

Introduction Course : Gives the new resident a thorough background in the anatomy, physiology and pathology of Otolaryngology and provides them a thorough understanding of the method of diagnosis, laboratory test, and methods of treatment of ENT diseases. This course usually meets the last week of February.

Dissection Course : Temporal bone dissection for the 3rd year resident.

Neck dissection for the 3rd and the 4th year resident.

Nose & paranasal sinus dissection for the 2nd year resident.

Thoroughly familiarize the participant with the intricate three dimensional anatomy of the human nose, neck and temporal bone, give them an opportunity to develop the skills necessary for live surgery via a hands-on-approach with close guidance and instruction in the temporal bone laboratory and department of Anatomy. The participant should gain a working knowledge of the application of the techniques for actual patient application. These courses usually are held once a year. Temporal bone dissection course usually meets May or June of the year. Paranasal sinus and neck dissection courses depend on condition of the department of Anatomy.

Temporal Bone Histopathology Course : The residents are required to understand the intricate three dimensional anatomy of the human temporal bone including the basic histological anatomy of the middle ear and inner ear as described in standard textbooks. The objective of this course is to thoroughly familiarize the resident with the detailed anatomy of the temporal bone before the surgical dissection. An effort will be made to correlate the various anatomical findings with diagnostic and surgical problems that arise in the Otolaryngological area.

Ajou Otology Symposium : Sixth symposium was held in Jun 17, 2000. The title of the symposium was "Otitis Media-Infection & Immunity". This symposium consisted of 7 topics of lecture. Topics were as follows : 1)What is the role of infection in OM? 2)Microbiology in OM & sinusitis 3)Bacterial resistance & antibiotic therapy 4)Local antibiotic delivery for the treatment of sinusitis 5)Vaccination for OM treatment : overview 6)Vaccines for prevention of AOM 7)Current concepts in mucosal vaccine developments.

## MEDICAL STUDENTS EDUCATION

### Joong-Wha Koh, M.D.

- Structure & function of larynx, trauma of larynx, hoarseness : lecture for junior students (Mar 2, 2000)
- Deep neck infection, neck mass, pediatric otolaryngology, diagnosis & treatment of head and neck tumor : lecture for junior students (Mar 9, 2000)
- Management of head and neck cancer I, II, III, case discussion : lecture for junior students (Mar 16, 2000)

## RESIDENTS EDUCATION

### Young-Myoung Chun, M.D.

- Temporal bone dissection (Jun 18, 2000)

## Thesis for Ph.D.

### Ju-Hyun Eum, M.D.

- The morphologic study of developing murine eustachian tube

### Jin-Seok Lee, M.D.

- Reversibility for epithelium of experimentally induced cholesteatoma in Mongolian gerbils

## Thesis for Master's Degree

### Jung-Whan Song, M.D.

- Molecular genetic analysis of connexin 26 in Korean congenital hearing loss

### Jeong-Min Chun, M.D.

- Expression of phosphatidylinositol 3'-kinase in experimentally induced cholesteatoma using Mongolian gerbils

## OTHERS

### Keehyun Park, M.D.

- Inner ear anomaly with perilymphatic fistula : case presentation at nine medical schools joint conference  
(Catholic Medical Center, Seoul : May 2, 2000)
- Moderator at Basic Otological Session of the Korean Combined Otological Session of the Korean Combined Otolaryngological Congress  
(Chunahn : Apr 22, 2000)

- Management of ENT diseases : lecture for a nursing teacher training program in Kyungki area  
(Suwon : Jun 14, 21, 2000)
- Moderator at research session( I ) of the 6th International Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 29, 2000)
- Is the cholesteatoma a defective wound healing?: Round table session at the 6th International Conference on Cholesteatoma and Mastoid Surgery  
(Cannes, France : Jun 30, 2000)

#### Hong-Joon Park, M.D.

- Neonatal hearing loss : lecture for students at Kyung Hee University College of Medicine  
(Seoul : Mar 22, 2000)
- Neonatal screening test : lecture at audiometrist education workshop by Korean Otolaryngological Society (Seoul : Jun 21, 2000)

#### Joong-Wha Koh, M.D.

- A case of primary amyloidoma of tonsil : case presentation nine medical schools joint conference (Seoul : Jun 1, 2000)
- A case of hemangiopericytoma of parotid gland : case presentation at nine medical schools joint conference (Seoul : Dec 17, 2000)

#### Kyung Shik Suh, M.D.

- Iatrogenic CSF rhinorrhea : case presentation at nine medical schools joint meeting  
(Seoul : Mar 2, 2000)
- Diagnosis and management of olfactory disturbance :lecture for ENT practitioner in Suwon area (Suwon : Mar 18, 200)
- Dacrocystorhinostomy : lecture for ENT practitioner in Shinchon area  
(Seoul : Apr 20, 2000)

#### Kim Seong Kyun, M.D.

- Intern' s job in ENT department : lecture for intern in Ajou University Hospital  
(Suwon : Apr 15, 2000)

**VISITING PROFESSORS**• Byung Hoon Jun, M.D.

Professor, Department of Otolaryngology, Seoul Paik Hospital, Inje University College of Medicine “ Treatment of tinnitus” (May 20, 2000)

• Soo-Geun Wang, M.D.

Professor, Department of Otolaryngology, Pusan National University College of Medicine  
“Glottic cancer” (Jun 16, 2000)  
“Early diagnosis of hypopharynx cancer” (Jun 17, 2000)

• Jae-Hoon Song, M.D.

Professor, Department of Internal Medicine, Division of Infectious Disease  
Sungkyunkwan University College of Medicine  
“Bacterial resistance & antibiotic therapy” (Jun 17, 2000)

• Ick-Chan Kwon, PhD

Research Scientist, Life Sciences Division, KIST  
“Local antibiotic delivery for the treatment of sinusitis” (Jun 17, 2000)

• Young-Mo Son, M.D.

Professor, Department of Pediatrics Yonsei University College of Medicine  
“Vaccines for the prevention of AOM” (Jun 17, 2000)

• Seung-Yong Seong, M.D.

Professor, Department of Microbiology , Seoul National University College of Medicine  
“Current concepts in mucosal vaccine developments” (Jun 17, 2000)

• Jeung-Gweon Lee, M.D.

Professor, Department of Otolaryngology, Yonsei University College of Medicine.  
“ENT care for snoring patients” (Jul 15, 2000)

## **PATIENT CARE**

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<b>Outpatient visits</b>	<b>Total</b>	<b>36,201</b>
include	New	9,177
	Old	27,024
<b>Inpatients</b>		<b>1,495</b>
<b>Emergency Room Visit</b>		<b>1,092</b>
<b>Operative cases (procedures)</b>	<b>Total</b>	<b>1,687 (2,758)</b>
include	Ear	507 (908)
	Nose	408 (946)
	Head & Neck	772 (904)
<b>Audiology</b>	<b>Total</b>	<b>9,924</b>
include	Pure tone audiogram	4,327
	Impedance audiogram	3,262
	Tinnitogram	364
	Brain stem auditory evoked potential	362
	Speech audiogram	1,549
	Otoacoustic emission	1,422
	E-tube function test	47
	T.D. & SISI	1
<b>Hearing Aids</b>		<b>69</b>
<b>Vestibular Function Test</b>		<b>515</b>
<b>Vocal Dynamic Lab. Examination</b>		<b>153</b>
<b>Speech Therapy</b>		<b>954</b>
<b>Allergy clinic</b>		<b>293</b>

All totals are for the period Mar 1, 2000 through Feb 28, 2001.

## Operative Procedure

<b>EAR</b>	<b>Total</b>	<b>908</b>
include	Atticotomy	20
	Canaloplasty	4
	EAC mass excision	9
	Explotympanotomy	9
	Facial nerve ene to end anastomosis	1
	Facial-Hypoglossal anastomosis	1
	Facial nerve decompression	2
	Fistulectomy	18
	Incision & drainage	2
	Intact canal wall mastoidectomy	16
	Mastoid obliteration	9
	Meatoplasty	4
	Modified radical mastoidectomy	1
	Myringoplasty	21
	Myringotomy	5
	Open cavity mastoidectomy	42
	Ossiculoplasty	52
	Patch graft	1
	Radical mastoidectomy	1
	Revision mastoidectomy	1
	Revision tympanoplasty	6
	Simple mastoidectomy	4
	Sebaceous cyst excision	2
	Stapediomyringopexy	7
	Total enucleation of facial schwannoma	1
	Translabyrinthine approach	5
	Tympanoplasty	258
	V-tube insertion	405
	Wound debridement	1

<b>NOSE</b>	<b>Total</b>	<b>946</b>
include	Ala base resection	1
	Antral douche	1
	Augmentation rhinoplasty	6
	Caldwell-Luc op.	4
	Closed nasal bone reduction	16
	Conchotomy	237
	Endoscopic DCR	2
	Endoscopic marsupialization	1
	Epistaxis control	3
	Intranasal ethmoidectomy	18
	Frontal sinusotomy	5
	Frontal sinus irrigation	1
	Inferior meatal antrostomy	21
	Mass excision	6
	Middle meatal antrostomy	46
	Polypectomy	16
	Radical op. of maxillary & ethmoid sinus	207
	Radical op. of pansinus	153
	Septoplasty	197
	Sphenoidotomy	1
	Transsphenoid approach	2
	Turbinoplasty	2

## HEAD &amp; NECK

## Total

include	Adenoidectomy	54
	Aseptic dressing	5
	Aspiration	1
	Bleeder ligation	2
	Bronchoscopy	5
	Diagnostic	5
	Foreign body removal	12
	Bouginage	1
	Granulation tissue removal	8
	Endoscopic adenoidectomy	2
	Esophagoscopy	15
	Diagnostic	15
	Foreign body removal	21
	Bouginage	3
	Excision	4
	Congenital neck mass	4
	Oral cavity mass	16
	Excisional biopsy of neck mass	6
	Frenotomy	34
	Glossotomy	1
	Hemilaryngectomy	1
	Incision & drainage for deep neck infection	36
	LAUP	7
	Laryngomicrosurgery	78
	Laryngofissure & cordectomy	1
	Lithotomy	2
	Major reconstruction	1
	Regional flap	1
	Mass excision	3
	Marsupialization of ranula	3
	Neck dissection	23
	Radical	2
	Modified radical	4
	Lateral	6
	Supraomohyoid	3
	Central	8
	Parotidectomy	4
	Superficial	4
	Partial removal of epiglottis	1
	Primary closure of stab wound	4
	Sistrunk operation	9
	Stomoplasty	2
	Submandibular gland excision	6
	T-E fistular repair	1

Thyroidectomy	18
Lobectomy	11
Total	7
Tonsillectomy	116
Tonsillectomy & Adenoidectomy	256
Total laryngectomy	4
Tracheal stoma revision	1
Tracheoesophageal fenestration & Provox insertion	1
Tracheal cannular insertion	1
Tracheotomy	74
Triple endoscopic biopsy	6
T-tube insertion	3
T-tube removal	2
Type 2 thyroplasty	1
Uvulopalatopharyngoplasty	19
VC lateralization	1
Wide excision	5
Buccal mucosa cancer	1
Gingival cancer	1
Tongue cancer	3
Wound debridement	3
Total	904

# FACILITIES & EQUIPMENT

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## 1. OUTPATIENT CLINIC

1) ENT unit and chair	
Reliance (Models 425/ 525) .....	7
Reliance (Models 7000LFC/HFC) .....	7
2) Audiological Laboratory	
Audio Booth	
Single room (Delta 143-A) .....	1
Double room (RS 253-B) .....	1
Pure Tone Audiometry .....	2
Virtual model 322	
Macintosh LC/475	
Style writer II	
Madsen Orbiter 922 version 2	
Otoacoustic Emission .....	1
ILO 92	
Samsung sync master 3G	
Intercom (Samsung 486 Green Computer)	
Hewlett Packard deskjet 505	
Auditory Brain Stem Response Audiometry .....	1
Navigator (Bio-Logic)	
Biologic Samtron monitor	
Hewlett Packard paintjet	
Impedance Audiometry .....	2
Virtual model 310	
Macintosh LC/475	
Style writer II	
Madson 20 DIAC 901	
Siemens Hearing Analyzer, Real Ear Measurement .....	1
Hyunju monitor	
Hyunju computer	
HiPRO	
Hewlett Packard deskjet blok	
3) Vestibular Function Laboratory	
Computerized ENG system (Micromedical Technologies INC.) .....	1
Digital light bar (Model 15003)	
Samsung sync master 3G	
Intercom (Samsung 486 Green Computer)	
Hewlett Packard laserjet 4	
Rotation Chair System (Micromedical Technologies INC.) .....	1
Rotatory chair (System 2000)	
Drum	

Controller (Model 300)	
Samsung sync master 3G	
Intercom (Samsung 486 Green Computer)	
Brookler-Grams Closed loop caloric irrigator .....	1
4) Vocal Dynamic Laboratory .....	1
Bruel & Kjaer Rhino-Larynx Stroboscope 4914	
CCD camera (Toshiba)	
Camera controller (Toshiba)	
VCR (Panasonic SVHS. AG-1970)	
Color monitor (Sony Trinitron)	
Color printer (Sony CVP-M3)	
5) Low Power Laser (Felas Medical Laser HN12) .....	1
6) Emergency kit .....	1
7) Autoclave .....	1
8) Operating microscope .....	2
Carl Zeiss OMPI 111	
Carl Zeiss OMPI 99	
9) Visual Education System .....	1
CCD camera (Toshiba)	
Camera control Unit (Hitachi)	
Sony digital video adapter (XV-D300)	
Telecam (Storz NTSC)	
VCR (Panasonic SVHS, AG-7350)	
Color monitor (Sony Trinitron)	
Color printer (Sony Mavigraph)	
10) Camera system .....	1
Nikon 801	
11) Plastic Model .....	3
Skull .....	1
Larynx .....	1
Ear .....	1

**2. OPERATION ROOM**

Tonsillectomy set .....	4
T et A set .....	3
ENT prep. ....	3
Tympanoplasty set .....	3
V-tube set .....	2
Head rest set .....	1
Transtemporal supra-labyrinthine approach set .....	1

Microsurgery set .....	1
Nasal basic set .....	4
Nasal dressing set .....	4
Submucous resection set. ....	3
Intranasal antrostomy set. ....	2
Caldwell set .....	2
Antral douche set .....	2
Tracheostomy set .....	1
Excision set .....	1
Laryngectomy set .....	1
Endoscope set .....	2
Operating microscope (Zeiss) .....	2
OMPI-CS-I S4	
OMPI-MDM	
Drill system surgical (Xomed-Treace) .....	9
APS .....	2
MPS-2000 .....	3
New-MPS .....	4
Otoscope(Karl-Storz) .....	1
Endoscopes	
Esophagoscope set .....	1
Bronchoscope set .....	2
Adult set	
Child set	
Laser Bronchoscope set .....	1
Laryngoscope set .....	2
Surgical head light system .....	2
Karl-Storz	
Nerve monitoring system (NIM2) .....	1
LASER system .....	2
Carbon Dioxide	
Contact YAG	
Visual education system .....	1
CCD camera & VCR system	
Color monitor (Anam)	

### 3. OA SYSTEM

Computer system & printer	
32 bit IBM PC (486) .....	2
32 bit IBM PC (586) .....	2
Hewlett Packard scanjet 3C .....	1

Laser printer IIG .....	1
Macintosh LC/475 .....	2
Power Macintosh 7500/100 .....	1
Printer (Epson stylus 800) .....	1
QMS 1660E Printer system .....	1
Projector (Kodak) .....	2
5600 KK	
4600 KK	
Overhead projector (3M) .....	1
Laser indicator .....	5
Copy machine .....	
(Korea Xerox XK-392) .....	1
(Sindo Ricoh NT-4040) .....	2
Video system .....	1

**4. LABORATORY**

Light Microscope (Olympus) .....	3
Microscope WILD M651 (Leica) .....	1
Microprobe(Fischer Biotech) .....	1
Temporal bone dissection set.....	1

**5. VIDEO LIBRARY**

- Application of the contact laser in otorhinolaryngology and head & neck surgery
- Allergy in house dust mite
- Canal reconstruction procedure (Penrose production)
- Diffuse exostosis & osteoma of the external auditory canal
- Facial nerve surgery (Jack L. Pulec)
- Facial nerve & chronic ear surgery (James L. Sheehy)
- Interactive trip in otology (R. Vincent)
- IONOS Middle ear prosthesis operation
- Keratosis obturans (James L. Sheehy)
- KTP/ 532 Laser system in otorhinolaryngology
- Laser engineering Inc.
- Laser assisted uvulopalatoplasty
- Meniere's disease (Schuknecht)
- Microsurgery of the skull base (U. Fisch)
- Nasal allergy
- Nerve integrity monitor (Xomed-Treace)
- Nystagmus & caloric test analysis flexibility (Micromedical technologies)
- Provox (J.M. Hilger, J.M. Balm)

Reconstruction of the ossicular chain (G. Geyer)

Sinus surgery

Stapes fixation (U. Fisch)

Stapedectomy (Schuknecht)

Sinojet (ATOS)

Swift Laser system for office ENT procedures (LAUP, tonsils, turbinates)

Surgical anatomy of the temporal bone(Mario Sanna)

1. Surgical anatomy of the temporal bone (part I)
2. Surgical anatomy of the temporal bone (part II)
3. Topographic anatomy of the temporal bone
4. Surgical anatomy of the lateral skull base, The infratemporal fossa approach A
5. The infratemporal fossa approach B & C
6. The enlarged translabyrinthine approach
7. Middle fossa approach, etc.
8. The system of the modified transcochlear approach (part I)
9. The system of the modified transcochlear approach (part II)
10. The system of the modified transcochlear approach (part III)

Surgical technique of the temporal bone & skull base (Silverstein, Rosenberg)

1. Instrument set-up, etc.
2. Laser stapedotomy
3. Tympanoplasty
4. Revision mastoid-tympanoplasty
5. Combined retrolabyrinthine/retrosigmoid vestibular neurectomy
6. Singular neurectomy, Acoustic neuroma

Temporal bone dissector (N.H. Blevins)

The 5th international symposium on recent advances in otitis media (T. Kumazawa)