suppressed the bone hyperplasia and the narrowing of pneumatic space in the middle ear cavity more clearly than the mucosa-eliminated control group. The mucosal gas exchange function was also found to be good in the cell sheet-transplanted group. These results suggested that post-transplanted middle ear cavity was not only morphologically but also functionally similar to the normal middle ear cavity. Nasal mucosal epithelial cell-sheet was confirmed to be useful as an effective graft material after middle ear surgery and hopefully become a novel therapy in the future.

Postoperative regeneration of the middle ear mucosa and pneumatization of the middle ear cavity are of great importance after middle ear surgery. This study developed a new method to transplant autologous nasal mucosal epithelial cell-sheets into the damaged middle ear cavity. The aim of this study was to evaluate postoperative healing after the transplantation of the cell sheets in rabbits. Rabbit nasal mucosal epithelial cell-sheets were fabricated from a temperature-responsive culture dish and transplanted into the damaged middle ear of rabbit, which was surgically created. The healing of middle ears was evaluated with histological methods and computed tomography findings at 8 weeks after transplantation. Functional evaluation was performed by measuring the maximum middle ear total pressure reflecting a trans-mucosal gas exchange function. Two control groups were used: the normal control group and the mucosa-eliminated control group. Transplantation of nasal mucosal epithelial cell-sheets suppressed the bone hyperplasia and the narrowing of pneumatic space in the middle ear cavity more clearly than the mucosa-eliminated control group. The mucosal gas exchange function was also found to be good in the cell sheet-transplanted group. These results suggested that posttransplanted middle ear cavity was not only morphologically but also functionally similar to the normal middle ear cavity. Nasal mucosal epithelial cell-sheet was confirmed to be useful as an effective graft material after middle ear surgery and hopefully become a novel therapy in the future.

doi:10.1017/S0022215116003790

Basic research on the otological fields (N775)

ID: 775.3

Novel biomarker to detect perilmph leakage, CTP (Cochlin tomo-protein, an isoform of Cochlin)

Presenting Author: **Tetsuo Ikezono**

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Learning Objectives: Perilymphatic fistula (PLF) is an abnormal connection between the inner and middle ear. A procedure for obtaining definite proof of a PLF remains elusive, and methods of diagnosis remain controversial. CTP is a novel biochemical marker that allows a definitive diagnosis of the etiology of PLF-related hearing loss and vestibular disorders. The science of PLF will be discussed in this talk.

Introduction: Numerous biomarkers for dizziness and hearingloss has been suggested including autoantibodies, inflammatory cytokines, CRP. Among these, CTP (Cochlin tomoprotein, an isoform of Cochlin), perilymph specific protein, is a novel and unique biomarker. We have reported a biochemical test for perilymph leakage detecting CTP in middle ear lavage (MEL, lavaging the middle ear cavity using 0.3 ml saline).

Methods: Recently we could establish a highly reliable ELISA-kit to detect CTP. The Japanese PLF diagnosis criterion is now based on the visual identification of the fistula (not a leakage) and/or detecting CTP. With a help of private clinical test enterprise (SRL inc.) in Japan, CTP test is widely available nationwide, in 170 hospitals.

Diagnostic Accuracy of the test is very high. If there is 2ul of leaked perilymph in the MEL, the test is positive. The diagnostic performance of the test has a high reliability, and the AUC in ROC analysis was greater than 0.90.

Results: The pattern of hearing loss of CTP positive PLF cases varies, including sudden onset, progressive, fluctuating or recurrent. In some patients with positive CTP test, dizziness is their chief complaint not hearing loss.

Conclusions: What We Could Learn from the CTP Test in hearing loss and/or dizzy patients. We believe CTP test will give the answer to the long-standing debate about the existence of PLF.

doi:10.1017/S0022215116003807

Basic research on the otological fields (N775)

ID: 775.4

Molecular mechanisms and fundamental therapies for a mouse model of Gjb2-related deafness

Presenting Author: **Katsuhisa Ikeda**

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Learning Objectives: Hearing loss is the most widespread sensory disorder, with an incidence of congenital genetic deafness of 1 in 1,600 children. For many ethnic populations, the most prevalent form of genetic deafness is caused by recessive mutations in the gene gap junction protein, beta 2, 26 kDa (*GJB2*), which is also known as connexin 26 (*Cx26*). For more than 15 years, we have developed and evaluated a mouse model of *Gjb2*-related deafness as follows, i) a dominant-negative *Gjb2* R75W transgenic mouse model shows incomplete development of the cochlear supporting cells, resulting in profound deafness from birth (Kudo et al., Hum Mol Genet 2003; Inoshita et al., Neuroscience 2008), ii) the outer hair cells (OHCs from the dominant-negative mutation of *Gjb2* are deformed, but reveal normal development and maturation (Minekawa et al. , Neuroscience 2009), iii) Cx26 dysfunction is associated with delayed apoptosis and retention of the greater epithelial ridge cells (Inoshita et al., BMC Genet 2014), iv) the disruption of the cochlear gap junction plaques is associated with the *Gjb2*-related deafness and the the assembly of cochlear gap junction plaques is dependent on Cx26 (Kamiya et al., J Clin Invest 2014), vi) the deformation of OHCs and the accumulation of caveolin-2 in the organ of Corti plays a crucial role in the progression of, or secondary OHC loss in, *Gjb2*-associated deafness (Anzai et al., Plos One 2015). In the next, we focused on the development of fundamental therapies for *Gjb2*-related deafness. Successful transgene expression was obtained through the round window membrane in the supporting cells of the neonatal mouse cochlea using adeno-associated viral (AAV) vectors without causing additional damage to the cochlear function (Iizuka et al., Huma Gen Ther 2008). Perinatal cochlear delivery of *Gjb2* using an AAV significantly improved the auditory responses and development of the cochlear structure (Iizuka et al., Hum Mol Genet 2015).

doi:10.1017/S0022215116003819

Ossicular Reconstruction (R776)

ID: 776.1

The use of the Dresden partial clip prosthesis in ossicular reconstruction

Presenting Author: **Christopher Aldren**

Christopher Aldren

Wexham Park Hospital

Learning Objectives: To demonstrate the use of the Dresden partial clip prosthesis and show results.

The Dresden partial clip prosthesis is a titanium prosthesis used for ossicular reconstructin in the presence of a mobile stapes. Video will be shown to demonstrate its ease of application. Results will be presented and compared to the authors experience with other prostheses. Cases requiring revision will be discussed with video illustration.

doi:10.1017/S0022215116003820

Endoscopic Ear Surgery: Concept and Technique (1) (V777)

ID: 777.1

Direct Cost Comparison of Totally Endoscopic versus Open Ear Surgery

Presenting Author: **Nirmal Patel**

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Learning Objectives: Objective: The introduction of new surgical techniques requires not only an evaluation of safety and clinical efficacy but also cost justification. Totally Endoscopic Ear Surgery (TEES) is a relatively new technique for managing chronic ear disease. The cost of specialised equipment required may be a barrier to implementation of the technique. This study aims to test the null hypothesis that open and endoscopic approaches have similar direct costs for the management of attic cholesteatoma in an Australian private hospital setting. Study Design: A retrospective direct cost comparison from a hospital perspective, of TEES and traditional canal wall up mastoidectomy for the management of attic cholesteatoma in the private tertiary setting was undertaken. Indirect and future costs were excluded. Methods: A cost comparison of anaesthetic set up and resources, operative set up and resources, average cost of running an operating theatre and cost of overnight admission was performed between the two techniques. Results: TEES has a mean reduction of AUD$2998.63 per operation from the hospital perspective when compared to an open procedure for attic cholesteatoma. Conclusion: Once the learning curve is achieved, TEES is more cost effective from a hospital perspective, than canal wall up mastoidectomy for attic cholesteatoma. When indirect and future costs are considered as well, the economic gain of managing attic cholesteatoma endoscopically could possibly be even greater.

Objective: The introduction of new surgical techniques requires not only an evaluation of safety and clinical efficacy but also cost justification. Totally Endoscopic Ear Surgery (TEES) is a relatively new technique for managing chronic ear disease. The cost of specialised equipment required may be a barrier to implementation of the technique. This study aims to test the null hypothesis that open and endoscopic approaches have similar direct costs for the management of attic cholesteatoma in an Australian private hospital setting.

Study Design: A retrospective direct cost comparison from a hospital perspective, of TEES and traditional canal wall up