

another institution were excluded. Twenty-two patients (age,  $37 \pm 13$  yr) fit within the above condition. CT-scan was performed every year after surgery, and antrum pneumatization was evaluated. Pre- and post-operative pure-tone averages (PTA) and average air-bone gaps (ABG) were analyzed. PTA was calculated as the mean of 0.5, 1, 2, and 4 kHz thresholds. ABG was determined from air conduction (AC) and bone conduction (BC) thresholds that were measured at the same time. Average ABG (AABG) was calculated as the mean of 1, 2, and 4 kHz thresholds. Variables were shown in mean  $\pm$  SD. Hearing results were compared using Mann Whitney test.

**Results:** Twelve patients had the pneumatized antrum (P-Group) and 10 did not (non-P-Group). Following results were shown in P-Group and non-P-Group, respectively: (1) pre-operative PTA was  $37 \pm 8$  and  $40 \pm 24$  dB; (2) pre-operative AABG was  $20 \pm 8$  and  $18 \pm 12$  dB; (3) the change in PTA was  $7 \pm 12$  and  $-1 \pm 14$  dB; (4) the change in AABG was  $4 \pm 13$  and  $-2 \pm 14$  dB. The variables were not statistically different between two groups.

**Conclusion:** With this sample size, pneumatization of the antrum do not have an impact on hearing outcome statistically in patients operated with CWDT-STR.

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## ID: IP127

### Analysis of the characteristics of hearing loss of PLF cases

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**Learning Objectives:** Background & Method: Perilymphatic fistula (PLF) is defined as an abnormal communication between the perilymph and middle ear, where there are leaky sites. The clinical manifestation of PLF is widely variable, and there was no physiological or biochemical diagnostic test for PLF that has the proper specificity and sensitivity. Therefore, it is very difficult to make a definite diagnosis of PLF. By the proteomic analysis, we have identified an isoform of Cochlin, CTP (Cochlin tomo-protein). CTP is a perilymph specific protein, which is not expressed in blood, CSF or saliva. We could establish a highly reliable ELISA-kit and again we could confirm this specific expression of CTP. With this background, in 2013, Japanese PLF diagnostic criteria was proposed. In this criteria, a definite diagnosis can be made with one of these basic rules, (1) a fistula is identified between the middle ear and the inner ear by microscope or endoscope, (2) Cochlin tomo-protein (CTP) is detected from the middle ear lavage (MEL). MEL was collected as follows: (1) after myringotomy or during PLF repair surgery, the middle ear was rinsed with 0.3 ml saline, (2) MEL was recovered and blood cells and cell debris were removed, (3) the supernatant was taken and stored frozen. If there is 2  $\mu$ l of perilymph in the MEL, the

test is positive. So far, we already have tested about 3000 samples including MEL, perilymph, serum, CSF etc. Between April 2014 and March 2015, 281 PLF suspected cases who had antecedent traumatic events were tested by the standardized CTP detection test protocol. In 281 cases, 61 (22%) were positive with CTP. The characteristics of hearing loss was vary, sudden hearing loss (26 cases), recurrent (8 cases), sudden and progressive (7 cases), progressive (7 cases) and fluctuate (5 cases). Our results indicates PLF is a real clinical entity and should be considered as pathological bases of sensorineural hearing loss.

**Background:** Perilymphatic fistula (PLF) is defined as an abnormal communication between the perilymph and middle ear, where there are leaky sites. The clinical manifestation of PLF is widely variable, and there was no physiological or biochemical diagnostic test for PLF that has the proper specificity and sensitivity. Therefore, it is very difficult to make a definite diagnosis of PLF.

By the proteomic analysis, we have identified an isoform of Cochlin, CTP (Cochlin tomo-protein). CTP is a perilymph specific protein, which is not expressed in blood, CSF or saliva. We could establish a highly reliable ELISA-kit and again we could confirm this specific expression of CTP.

With this background, in 2013, Japanese PLF diagnostic criteria was proposed. In this criteria, a definite diagnosis can be made with one of these basic rules, (1) a fistula is identified between the middle ear and the inner ear by microscope or endoscope, (2) Cochlin tomo-protein (CTP) is detected from the middle ear lavage (MEL).

**MEL was collected as follows:** (1) after myringotomy or during PLF repair surgery, the middle ear was rinsed with 0.3 ml saline, (2) MEL was recovered and blood cells and cell debris were removed, (3) the supernatant was taken and stored frozen. If there is 2  $\mu$ l of perilymph in the MEL, the test is positive.

**Method:** So far, we already have tested about 3000 samples including MEL, perilymph, serum, CSF etc. Between April 2014 and March 2015, 281 PLF suspected cases who had antecedent traumatic events were tested by the standardized CTP detection test protocol.

**Result and Conclusion:** In 281 cases, 61 (22%) were positive with CTP. The characteristics of hearing loss vary, sudden hearing loss (26 cases), recurrent (8 cases), sudden and progressive (7 cases), progressive (7 cases) and fluctuate (5 cases). Our results indicates PLF is a real clinical entity and should be considered as pathological bases of sensorineural hearing loss.

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## ID: IP128

### Tympanoplasty With Canal Wall Reconstruction Using Sliced Auricular Cartilage For Old Radicalized Cavities

Presenting Author: **Shinya Hirahara**

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*Learning Objectives:*

Tympanoplasty with canal wall reconstruction was performed using sliced cartilage, fascia, and inferior based musculoperiosteal flap in 46 patients with open mastoid cavities and hearing loss. All patients were followed for more than two years after the last operation. The mastoid skin was elevated and trimmed, and then the fascia and sliced auricular cartilage were transplanted to the mastoid side of the skin and covered using musculoperiosteal flap. The remaining space in the mastoid cavity was filled with bone chips (42 cases). In the cases involving a normal or shallow eardrum (24 cases, group A), ossicular reconstruction was performed at the same time. Among the cases involving an adhesive eardrum, two-staged surgery was planned in 11 cases (group B). The other 11 patients with adhesive eardrums were treated with one-stage ossiculoplasty where possible (group C). Hearing improvement was achieved in 75% (18/24 cases) of the cases in group A, 45% of the cases in group B (5/11 cases), and 18% of the cases in group C (2/11 cases) at 12 postoperative months. None of the patients developed recurrent discharge, cholesteatoma or granulation tissue, although one patient in group C (2%) suffered re-adhesion. The reconstructed tympanum and posterior canal wall appeared to be thick structures made of skin and sliced cartilage. The boot-shaped reconstructed canal was suited to staged ossiculoplasty because the shape-memory effect provided an adequate combination of stiffness and flexibility for the second stage. The structure remained relatively stable over the long term. This method has advantages for patients with adhesive eardrums that require secondary ossiculoplasty or an active middle ear implant.

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**ID: IP129**

**Practicality Analysis of JOS Staging System for Retraction Pocket Cholesteatoma: Japan Multicenter Study (2009–2011)**

Presenting Author: **Keiji Matsuda**

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*Learning Objectives:*

*Objective:* To analyze the practicality of staging criteria of acquired cholesteatoma (2010) for standardizing pathological condition in Japan.

*Design:* A multicenter, retrospective study.

*Setting:* Six academic tertiary referral centers.

*Participants:* A total of 446 patients that underwent surgery (for the first time) for acquired retraction pocket cholesteatoma between 2009 and 2010 at 6 institutions in Japan.

*Intervention:* Cases were managed by trans canal atticotomy (TCA, 42 cases), canal wall down and reconstruction (CWDR, 142 cases), canal wall down (CWD, 29 cases), or canal wall up technique (CWU, 233 cases).

*Main Outcome Measures:* The extent of cholesteatoma was surgically confirmed, and auditory outcomes and disease recurrence during 3 years after the last operation were assessed.

*Results:* The cholesteatoma affected the pars flaccida in 325 cases (73%), the pars tensa in 100 cases (22%), and both of these regions in 21 cases (5%). The frequency of postoperative air-bone gaps of < 20 dB was 70% in the pars flaccida group, 54% in the pars tensa group, and 43% in the combined group. These rates decreased as the cholesteatoma stage increased. The frequency of residual disease at the “second look” (10%) peaked at 12 postoperative months, whereas it peaked at 24–36 postoperative months after single-stage procedures (4%). Recurrent sac formation exhibited a similar frequency (4%) from 6 months to 36 months. The frequencies of all types of recurrence increased with the disease stage.

*Conclusion:* Disease stage was found to be related to hearing outcomes and the recurrence rate. This simple staging system may be particularly useful for standardizing the reporting of acquired cholesteatoma and for adjusting for the severity of the condition during outcome evaluations. It might also provide information that is useful for counseling patients.

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**ID: IP130**

**Canal wall down tympanoplasty with soft posterior meatal wall reconstruction in cases of recurrent cholesteatoma**

Presenting Author: **Saeko Matsuzaki**

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*Learning Objectives:*

*Introduction:* Prevention of postoperative recurrent cholesteatoma is one of the important goals in the management of cholesteatoma. Surgery for recurrent cholesteatoma could be rather challenging because of potential tendency towards recurrence. Canal wall down tympanoplasty can be a good surgical option with low rate of recurrence, and soft posterior meatal wall reconstruction has a feature of less formation of a narrow-neck retraction pocket after surgery compared to other hard-tissue reconstruction methods (Yamamoto-Fukuda et al, 2009). In order to achieve disease-free and dry ears after surgery on 13 recurrent cholesteatoma cases which we experienced for 3 years, we adopted a canal wall down technique with soft posterior meatal wall reconstruction. We present