inflammatory condition of their middle ear. In all cases, after complete eradication of the pathology, mastoid cavity was obliterated with abdominal fat followed by double layered external auditory canal obliteration with special cosmetic concern. Surgical outcomes of this procedure were analyzed.

Results: Middle ear inflammation and cholesteatoma were completely managed with this surgical technique. None of the patients showed the inflammatory symptoms of otorrhea or other early inflammatory complication after the surgery. Cochlear implant was successfully placed and active electrodes were fully inserted in all of the 10 patients. Only one patient showed the delayed extrusion of the ball electrode to the obliterated ear canal which was successfully managed by replacement of extruded ball electrode with conchal cartilage reinforcement under local anesthesia. Postoperative quality of life during the medical interview revealed the highly satisfied status of subtotal petrosectomy from both disease eradication and cosmetic viewpoints.

Conclusion: Subtotal petrosectomy seems to be very safe, effective and even cosmetically acceptable procedure for the deafened patients with chronic otitis media whether accompanying cochlear implantation is planned or not.

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Updates in the surgical managements for cholesteatoma (N845)

ID: 845.3

Atticosinoplasty for early cholesteatoma management

Presenting Author: **Yun-Hoon Choung**
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Learning Objectives:

Objective: These days surgery rates for early cholesteatoma and residual or recurrent cholesteatoma are increasing. For this matter, Prof. Keehyun Park suggested a surgical technique called 'atticosinoplasty' to mediate early cholesteatoma. Thus, we analyzed the adequacy and applicability of atticosinoplasty as a treatment for early cholesteatoma comparing with other surgical techniques.

Materials & Methods: One hundred seventy two patients who underwent atticosinoplasty (n = 72) or canal wall up mastoidectomy (n = 73) in Ajou University Hospital (Suwon, Korea) between 2002 and 2014 were enrolled in this study. Patients with less than 12 months of follow up period were excluded from this study. During the follow up, post-operative physical examination and audiometry were performed including temporal bone CT in necessary cases. Based on these data, recurrence and re-operation rate, pre- and post-operative hearing levels, and hearing gain were compared between both groups.

Results: The atticosinoplasty technique includes the removal of cholesteatoma through atticotomy or posterior sinusectomy, removal of incus and malleus, transmeatal endoscopic exploration, ossicle reconstruction and wall reconstruction with cartilage. There was no significant difference of hearing gain (PTA) between the atticosinoplasty group (44/72 patients) and the CWUM group (47/73 patients). Decrease of air-bone gap was detected in 61% (44/72) patients in the atticosinoplasty group and in 64% (47/73) in the CWUM group ($p > 0.05$). Revision mastoidectomy was performed in 3 (4.2%) in the atticosinoplasty group and in 4 (5.4%) in the CWUM group. However, revision ossiculoplasty was done less in the atticosinoplasty group (7, 9.7%) rather than the CWUM group (18, 24.6%) ($p < 0.05$).

Conclusion: Atticosinoplasty can be considered as an effective surgical technique for the treatment of early cholesteatoma, resulting in low recurrence rate and improved hearing.

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Updates in the surgical managements for cholesteatoma (N845)

ID: 845.4

Endoscopic management of cholesteatoma

Presenting Author: **IL-WOO Lee**

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Learning Objectives: Endoscope is widely accepted instrument for minimally invasive surgical approach for many clinical field. The main benefits of endoscopic management for cholesteatoma surgery are preserving the normal anatomical structure with complete removal of disease in the complicated middle ear structure. There are two aspects of endoscopic cholesteatoma surgery: totally transcanal endoscopic surgery vs. endoscope as an adjuvant instrument. Though totally transcanal endoscopic ear surgery (TEES) can provide wide surgical view without destruction of normal anatomical structures, it has disadvantage of one hand surgery with two instrument in relatively narrow ear canal. Surgical time for the TEES is longer than in microscopic surgery, especially for the beginners. We use the endoscope for every cholesteatoma surgery as an adjuvant instrument for microscopic surgery. With combined approach from both transcanal and transmastoid approach, we use the endoscope of 45 and 70 degree for inspection of blind spot in the middle ear cavity, and remove the remnant or residual cholesteatoma with intact canal wall. The chances of canal wall down approach were reduced dramatically with this methods. This technique is very useful especially for adhesive middle ear disease, attic cholesteatoma and congenital cholesteatoma. We will present the cases of adhesive middle ear disease, attic and congenital choesteatoma with this endoscope as an adjuvant for microscopic surgery.

Endoscope is widely accepted instrument for minimally invasive surgical approach for many clinical field. The main benefits of endoscopic management for cholesteatoma surgery are preserving the normal anatomical structure with complete removal of disease in the complicated middle ear structure. There are two aspects of endoscopic cholesteatoma surgery: totally transcanal endoscopic surgery vs. endoscope

as an adjuvant instrument. Though totally transcanal endoscopic ear surgery (TEES) can provide wide surgical view without destruction of normal anatomical structures, it has disadvantage of one hand surgery with two instrument in relatively narrow ear canal. Surgical time for the TEES is longer than in microscopic surgery, especially for the beginners.

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We will present the cases of adhesive middle ear disease, attic and congenital choesteatoma with this endoscope as an adjuvant for microscopic surgery.

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Updates in the surgical managements for cholesteatoma (N845)

ID: 845.5

Tailored management and long–term outcome of congenital cholesteatoma

Presenting Author: **Seung Ha Oh**

Seung Ha Oh

Seoul National University Hospital

Learning Objectives: As the endoscopic exam of tympanic membrane in young children become more popular, detection rate of early stage of congenital cholesteatoma has been increased significantly. Once identified, every cholesteatoma should be treated surgically with a primary goal of total eradication to obtain a safe and dry ear. The congenital cholesteatoma at anterior superior quadrant can be removed relatively easier than the posterior located one. Posterior mesotympanic choelsteatoma spreads posterior-superiorly, medial to incus body. It invades into the facial recess and sinus tympani and is prone to involve stapes and its joint. Epitympanum and mastoid invasion should be accessed by temporal bone CT and diffusion MRI image technique. These preoperative diagnostic evaluation can prevent the unnecessary mastoidectomy. Nowadays, it has been more popular to use endoscope during ear surgery. By using endoscopic assistance, transcanal approach could be enough to manage the most of congenital cholesteatoma which does not extend to the mastoid. In addition to that, the use of endoscope is justified for direct visualization of the deep sinus tympani. A long term follow up is necessary in order to detect the residual or recurrent cholesteatoma. Unwanted retraction or adhesion of tympanum are not infrequent especially in the posterior mesotympanic cholesteatoma cases. Our experience and management algorithm will be discussed.

As the endoscopic exam of tympanic membrane in young children become more popular, detection rate of early stage of congenital cholesteatoma has been increased significantly. Once identified, every cholesteatoma should be treated surgically with a primary goal of total eradication to obtain a safe and dry ear. The congenital cholesteatoma at anterior superior quadrant can be removed relatively easier than the posterior located one.

Posterior mesotympanic choelsteatoma spreads posterior-superiorly, medial to incus body. It invades into the facial recess and sinus tympani and is prone to involve stapes and its joint. Epitympanum and mastoid invasion should be accessed by temporal bone CT and diffusion MRI image technique. These preoperative diagnostic evaluation can prevent the unnecessary mastoidectomy.

Nowadays, it has been more popular to use endoscope during ear surgery. By using endoscopic assistance, transcanal approach could be enough to manage the most of congenital cholesteatoma which does not extend to the mastoid. In addition to that, the use of endoscope is justified for direct visualization of the deep sinus tympani.

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Outcome measure in Cholesteatoma Surgery (R846)

ID: 846.1

Systematic Review Questionnaires in Otology

Presenting Author: **Paul Merkus**

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Learning Objectives:

- To help the ENT surgeon identifying the most suitable questionnaire for their practice.
- To give a brief overview of all available otologic questionnaires.

Introduction: A Patient Reported Outcome Measure (PROM), like a questionnaire, is a valuable tool in assessing quality of health care from a patient perspective. Questionnaires are widely used by otologists. However, the large number of available questionnaires makes it almost impossible for the ENT surgeon to choose which one to use.

Methods: A systematic literature search has been conducted using the Embase and Pubmed medical databases. Questionnaires addressing any otologic complaint (tinnitus, hearing, earache, otorrhea, itch, dizziness, pressure sensation, and taste) were evaluated for eligibility by two independent researchers. Inclusion criteria were: human adult population, closed end questionnaire, English language and availability of the original article describing the development of the instrument. Methodological quality was