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Free Papers (F612)**ID: 612.2****Predictive parameters in hearing improvement after tympanoplasty for primary acquired cholesteatoma**Presenting Author: **Yasuhiro Arai**Yasuhiro Arai¹, Masahiro Takahashi¹, Ryohei Yaguchi¹, Naoko Sakuma², Nobuhiko Oridate¹¹*Yokohama City University School of Medicine,*²*Kaagawa Children's Medical Center**Learning Objectives:*

Introduction: The cholesteatoma classification and staging system were proposed by the Japan Otological Society in 2010. The criteria classifies cholesteatoma into three stages (I, II, and III), and mastoid development and status of the stapes were categorized into four stages (MC0-3 and S0-3). The aim of this study was to elucidate whether these parameters were associated with hearing improvement after tympanoplasty for primary acquired cholesteatoma.

Methods: One hundred eight patients with acquired middle ear cholesteatoma (116 ears) underwent tympanoplasty at the Yokohama City University Hospital from 2003 to 2014. The present retrospective study included 37 patients (38 ears) who underwent a single-staged canal wall down type III tympanoplasty with canal wall reconstruction in order to minimize the effect of surgical method on postoperative hearing level. We analyzed association between parameters such as cholesteatoma staging, mastoid development, status of the stapes, and material used in canal reconstruction and postoperative hearing improvement. Hearing improvement was evaluated according to the guidelines of the Japan Otological Society. Categorical and continuous variables were compared using the χ^2 and Wilcoxon rank-sum tests, respectively.

Results: Hearing improvement was achieved in 76.3% of the study ears (29 of 38). A significantly higher grade in the preoperative mastoid development was observed in the ears with improvement than those without ($P = 0.013$). There was no significant difference in other factors between the two groups. The mean postoperative volume of tympanic cavity in the ears with improvement ($n = 7$) and those without ($n = 4$) was 0.357 mL and 0.142 mL, respectively. The more developed preoperative mastoid seemed to be associated with the more aerated postoperative tympanic cavity.

Conclusions: Mastoid development was a predictive parameter in hearing improvement after tympanoplasty for primary acquired middle ear cholesteatoma.

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Free Papers (F612)**ID: 612.3****Dura involvement and lateral skull base reconstruction in cholesteatoma surgery: a retrospective study**Presenting Author: **Andreas Anagnostos**Andreas Anagnostos¹, David Schwarz², Sami Shabli², Antoniu-Oreste Gostian², Karl-Bernd Hüttenbrink²¹*Nicosia General Hospital & Larnaca General Hospital, Cyprus | University Hospital Of Cologne, Germany,* ²*University Hospital of Cologne, Germany*

Learning Objectives: - Dura involvement in cholesteatoma surgery is rare but possible. - Reconstruction of the lateral skull base can be performed using a variety of materials. - No intracranial complications are expected when dura involvement is recognized and treated properly.

Introduction: Due to its anatomical proximity to the tympanic cavity and the mastoid cells, the dura of the middle cranial fossa is occasionally involved in middle ear and mastoid surgery. This study investigates the frequency of dura involvement during cholesteatoma surgery in children and adult population.

Methods: A retrospective chart review of cholesteatoma surgeries between 2004 and 2015 at an academic tertiary care center was performed. Any kind of dura involvement, as well as the reconstruction techniques and long-term complications were documented.

Results: From 1291 cholesteatoma surgeries performed in the study period, a total of 97 (7.5 %) surgeries with dura involvement were identified. In the majority of these cases ($n = 74$, 5.7 %) the bone to the middle cranial fossa was missing and the otherwise intact dura was exposed. The dura was additionally damaged and cerebrospinal fluid leak was seen in six surgeries (0.5 %). In three cases (0.2 %) iatrogenic dura injury was reported, whereas in 9 surgeries (0.7 %) cholesteatoma came up to and infiltrated the dura. Reconstruction of the lateral skull base was performed using cartilage ($n = 24$, 1.9 %), polydioxanone (PDS)-foil ($n = 14$, 1.1 %), bone pate ($n = 8$, 0.6 %) and fibrin glue ($n = 5$, 0.4%). In 11 cases (0.9 %) a combination of autologous materials - such as cartilage, bone pate, muscle and connective tissue - was used, whereas in 33 surgeries (2.6 %) no reconstruction of the lateral skull base was performed. In a follow-up time period of 19.7 months (range 1 day - 104 months) no intracranial complications were reported.

Conclusions: The involvement of the dura of the middle cranial fossa is a rare but possible phenomenon during cholesteatoma surgery. A variety of reconstruction materials are available for the sufficient reconstruction of the skull base in such cases. When recognized and treated properly, no intracranial complications are expected, even in long term time period.

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Free Papers (F612)**ID: 612.4****A paradigm shift in the management of petrous temporal bone cholesteatoma?**Presenting Author: **Shami Acharya**Shami Acharya, Harry Powell, Sherif Khalil, Shakeel Saeed
The Royal National Throat Nose and Ear Hospital

Learning Objectives:

Introduction: Petrous temporal bone cholesteatoma (PTBC) poses a significant management challenge. The location and nature of the disease as well as surgery carry risks to vital anatomical structures with potential impact on quality of life. Traditionally an aggressive surgical approach has been used. We present our series of PTBC; their classification, management, hearing and facial nerve outcomes.

Method: A retrospective case note review was carried out for all petrous cholesteatomas managed by the senior authors from 2008–2016. The study was an analysis of service provision and therefore formal ethical approval was not required.

Results: 15 patients were included in the study (mean age 42y 6 m; 10 males). Using Sanna et al.'s classification there were: 4 supralabyrinthine (Class I), 3 infralabyrinthine (II), 4 labyrinthine-apical (III), 4 massive labyrinthine (IV) and 1 apical (V). Hearing loss was a presenting symptom in 80% of patients, four of which were dead ears and 40% had a degree of facial nerve palsy. Mean follow-up was 1391 days. 5/15 patients underwent otic capsule sparing surgery. Recurrence occurred in 8 patients (53%), who all underwent further surgery and are currently disease free. Post operatively 20% had worse hearing (all requiring a labyrinthectomy or transotic approach). Four patients had new or worse facial weakness post operatively and three of these have had subsequent facial reanimation surgery.

Conclusion: The aim in PTBC management is total exenteration of disease while minimizing complications. Compared to other series in the literature we have a higher residual/recurrence rate due to a more conservative surgical approach in recent years. Advances in diffusion-weighted magnetic resonance imaging enable a less aggressive initial approach and directed second stage surgery in cases with residual disease.

Learning points: Long term outcomes will determine whether a less aggressive initial surgical approach is acceptable (for managing PTBC).

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Free Papers (F612)**ID: 612.5****A novel cartilage slicer and its performance tests**

Presenting Author: **Onur Ergun**

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Hacettepe University School of Medicine

Learning Objectives:

Objective: This study investigates the performance and benefits of a novel cartilage slicer device, which we refer to as “Hacettepe cartilage slicer” for otological procedures.

Method: 41 conchal and tragal cartilage pieces were harvested using a standard surgical method from 8 fresh

frozen human ears and their initial thicknesses were measured using a high accuracy digital micrometer. The harvested cartilages were then randomly sliced in 4 thickness levels using 2 different types of surgical blades. Then the thicknesses of the slices and remaining cartilages were measured. Scanning electron microscopy was utilized to determine the surface smoothness of the slices.

Results: Hacettepe cartilage slicer provided consistent results with each thickness setting and blade type. The results showed a proportional increase with the increasing thickness level with a clustering within a 0.1 millimeter distribution of the median value. The thicknesses of the slices and remaining cartilages provided evidence that our design slices the cartilage without any damage or squashing. Although both blades provided comparable satisfying results, scanning electron microscopy revealed that the slices cut with single bevel “chisel type” blade were superior regarding surface smoothness.

Conclusion: We believe that a reliable, surgical tool to slice autologous cartilage into undamaged, smooth slices at any desired thickness is major advantage for otologists. To our knowledge this study is the first to evaluate the performance of a cartilage slicer device. On the basis of this study, our novel cartilage slicer proved itself as a superior tool that is ready for human trials. A “razor sharp” disposable single bevel blade would offer the best results and slice thickness accuracy, precisely matching the desired thickness with a margin of error less than 0.1 mm.

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Free Papers (F612)**ID: 612.6****Incidence, recurrence rate and prognostic factors for cholesteatoma**

Presenting Author: **Anders Britze**

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Aarhus University Hospital

Learning Objectives:

Purpose: The purpose of this study was to calculate long term recurrence rates of cholesteatoma and to identify significant independent prognostic factors for the recurrence.

Materials and Methods: 147 children and adults operated for debuting cholesteatoma, primarily by CWU (canal wall up) mastoidectomy, at Aarhus University Hospital in the period 2001–2005 were included. Five- and ten-year Kaplan-Meier cumulative recurrence rates were calculated and significant prognostic factors were identified by Cox multivariate regression analyses. One year pre to post-operative hearing outcomes were assessed.

Results: Five and ten year recidivism rates (with confidence intervals) were 0.38 (0.31–0.46) and 0.44 (0.37–0.53) respectively. The same estimates from purely CWU with single-stage ossiculoplasties were 0.39 (0.3–0.51) and 0.49 (0.39–0.60) respectively. Independent significant prognostic