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Learning Objectives:

Objective: To determine which independent variables influencing the efficacy of type I tympanoplasty in adult and pediatric populations.

Data Sources: A search of the PubMed database and Cochrane Database of Systematic Reviews using the key words “tympanoplasty OR myringoplasty” from January 1966 to July 2014 was performed.

Study Selection: Studies reporting outcomes of myringoplasty or Type I tympanoplasty in primary non-cholesteatomatous chronic tympanic membrane perforation were included.

Data Extraction: Of 4,698 abstracts reviewed, 214 studies involving 26,097 cases met our inclusion criteria and contributed to meta-analysis.

Data Synthesis: The primary outcome of success was defined as closure rate at 12 months. The independent variables analyzed were age, follow-up period, approach, graft material, perforation cause, size, location, ear dryness, and surgical technique. Only those studies providing data on a given parameter of interest could be included when comparing each variable.

Conclusion: The weighted average success rate of tympanic closure was 86.6%. Based on this meta-analysis, there is a failure rate of tympanoplasty observed over time (worsened by 4.4% in follow-up periods >12 months). Pediatric surgery has a 5.8% higher failure rate than adults. Other variables associated with improved closure rates include perforation with a size less than 50% of total area (improved by 6.1%) and the use of cartilage as a graft (improved by 2.8% compared to fascia), while ears that were operated on while still discharging, those in different locations of the pars tensa, or using different surgical approaches or techniques did not have significantly different outcomes.

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New trends in cholesteatoma management (N733)

ID: 733.1

Why does cholesteatoma epithelium behave differently from normal skin? – a c-MYC study with special concern on proper CWD cavity cleaning.

Presenting Author: **Frigyes Helfferich**

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Learning Objectives: Genetics behind cholesteatoma formation.

In our country CWD tympanoplasty has been a widespread surgical technique in the recent decades to remove cholesteatoma. Therefore we meet several patients for regular check-ups, when the proper cleaning of the mastoid cavity is mandatory, otherwise severe inflammation may recur. The gold standard is the use of microscopes which allows good manipulation. However, to examine and clean hidden recesses, rigid or flexible endoscopes may be indispensable. Our technique is presented on a short video.

Uncleaned mastoid cavities filled with desquamation may behave like a cholesteatoma. Our working group tried to explain the genetical background of the different behavior of normal skin compared to the epithelium of the cholesteatoma. Previous studies have found aneuploidy of chromosome 8, copy number variation of c-MYC gene and the presence of elevated c-MYC protein level in cholesteatoma. We compared the expression of c-MYC gene in samples taken from acquired cholesteatomas, atheromas and normal skin samples using RT-qPCR. Significantly elevated c-MYC gene expression was found in cholesteatoma compared to atheroma and to normal skin samples. It implies a more prominent hyperproliferative phenotype that might be due to the presence of inflammation in acquired cholesteatoma.

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New trends in cholesteatoma management (N733)

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Subtotal petrosectomy in selected advanced cholesteatoma cases

Presenting Author: **Imre Gerlinger**

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Learning Objectives: Subtotal petrosectomy is the basic procedure in skull base surgery. It involves complete exenteration of all air cells of the temporal bone (middle ear and mastoid). It includes the following air tracts: retrosigmoid, retrofacial, antral, retrolabyrinthine, supralabyrinthine, infralabyrinthine, subprattubal and peritubal carotid cells. Only a few cells in the petrous apex left behind. The otic capsule is either removed or left behind. In advanced cholesteatoma cases, where numerous previous middle ear procedures could not reassure dry ear and when there is no possibility of hearing reconstruction and one wishes to attain a dry safe ear this procedure has proved to be the solution. Depending on the bone conduction result the procedure can be combined with the asimultaneous application of round window vibrant soundbridge or BAHA/Bonbridge implants. During the past years we carried out subtotal petrosectomies in 4 cases due to advanced cholesteatomas. The steps of the procedure will be demonstrated and conclusions will be drowed based on our experiences. Further rare indications of this useful procedure will be briefly discussed too.

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New trends in cholesteatoma management (N733)

ID: 733.3

Bony obliteration technique (BOT) surgery in paediatric cholesteatoma cases

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Learning Objectives: bony obliteration technique in pediatric acquired cholesteatoma - results and discussion on advantages

Paediatric cholesteatoma is aggressive, destructive disease to all surrounding tissues. It has high recurrent tendency even after careful removal. High complication rate, severe, sometimes life-threatening complications can occur. Hearing deterioration is characteristic. Main goals of therapy are the following:

- complete eradication of the disease (no residual disease)
- prevention of recurrent disease, prevention complications
- improvement of the hygienic status of the ear
- preservation or improvement of hearing

Formerly in childhood mostly operations has been done in 2 sessions: one year after the first op – enough time to grow a „spider-egg” to be removed and reconstruction. Today the method of choice is in cases of invagination cholesteatoma the CWU /CWD with BOT, complete removal of the matrix and keratin, primary reconstruction of the ear. For control of recurrent/ residual cholesteatoma is done by non-epi DW MRI.

Own results: In the last 5 years we had 53 cholest cases, 4 congenital, 49 epitympanic, and invagination type. In non-obliteration cases (n = 32) the recurrent/residual rate was 37, 5% (12), in obliteration cases (n = 17) this figure was 5, 9% (1). Hearing results in obliteration group was better than in non-obliteration group (average ABG improvement was 5, 3 vs 12, 5 dB).

Conclusion: After a learning curve BOT surgery is the method of choice in paediatric invagination cholesteatoma cases.

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New trends in cholesteatoma management (N733)

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Middle ear gas exchange problems in OME and cholesteatoma

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Learning Objectives:

Background: Gas pressure balance is substantial for normal middle ear (ME) function, however, mechanisms involved in the ME pressure control are still not fully understood. In vivo examination of the ME gas pressure (MEP) regulation is difficult, therefore mathematical models are developed to describe and test hypotheses concerning ME gas exchange function.

Objective: To examine the role of ET function and mastoid pneumatization in MEP balance, and to interpret the possible clinical relevance of the mathematical model predictions.

Method of approach: A mathematical description and MatLab® modeling of the MEP development is presented in the function of different ME volumes (V_{ME}), considering normal and malfunctioning ET. Published data as input values and our 3D CT reconstruction data of healthy and pathological MEs of children are applied.

Results: The model predicted larger MEP fluctuations in $V_{ME} < 3 \text{ ml}$ than in $V_{ME} \geq 3 \text{ ml}$ considering normal ET function due to the different pressure change rate and pressure buffer effect of the MEs. Substantially larger MEP fluctuations can be expected in a $V_{ME} < 3 \text{ ml}$ with malfunctioning ET. Modeling mastoid obliteration predicts similar MEP fluctuations to a $V_{ME} \geq 3 \text{ ml}$ resulting from elimination of gas exchange surface. The 5-year follow-up study in children with persistent OME indicates lower ME growth rate as compared to healthy