single surgeon between 2012 to 2014. We collected following data: kind of surgery (canal wall up (CWU) or canal wall down with mastoid obliteration (CWD), FND and its location after exenteration of disease, labyrinthine fistula, dural exposure and preoperative and postoperative facial function.

Results: The incidence of FND was 13% (29/224 ears) for total surgical procedures, 0.1% for CWU tympanoplasty (23/208), 38% for CWD tympanoplasty (6/16). The most common site of dehiscence (90%, 26/29) was the tympanic segment, posterior to the cochleariform process in 18 cases. We find 11 patients with labyrinthine fistula (5%) and 3 with dural exposure (1%). All but one have normal preoperative FN function, all retained normal function postoperatively.

Conclusion: In our series, incidence of facial nerve dehiscence and labyrinthine fistula was similar to the data reported in the literature. All patient retained normal function postoperatively.

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ID: IP111

Eustachian tube opening measurement by sonotubometry using perfect sequences for patients with chronic secretory otitis

Presenting Author: **Eugenijus Lesinskas**

Eugenijus Lesinskas[1], Vilma Beleskiene[2]

[1]Vilnius University Hospital santariskiu Clinics, [2]Vilnius University Hospital Santariskiu Clinisc

Learning Objectives: Most testing methods for evaluation of the Eustachian tube function are subjective and non-specific, likewise objective methods are insufficiently standardised and they poorly correlate with the clinical picture or are non physiological, therefore employed only under certain pathological conditions. Among the many studies, there is no 'golden standard' which could be widely used and serve as a benchmark to all.

The aim of the study: To examine the relationship between ET function and chronic middle ear diseases by applying sonotubometry with perfect sequences (PSEQ).

Methods: In order to objectively assess ET function, PSEQ-based sonotubometry results were assessed in healthy persons and in patients with ET dysfucntion. All subjects were performed comprehensive examination which included collection of anamnestic data, otoscopy, rhinoscopy, tympanometry, Valsava test and sonotubometry using PSEQ stimuli, nasal and nasopharyngeal videoendoscopy.

Results: The testing was conducted on 43 OME aptients (28 females (65,1%) and 15 males (34,9%)) and 39 healthy individuals (21 females (53,8%) and 18 males (46,2%)). The openings were not detected for 43,9 % of the OME patients and for 6,4 % of healthy individuals ($p < 0,001$). The mean ET opening duration in OME patients was 261 ± 147 ms, the mean sound wave amplitude $7,41 \pm 4,77$ dB , for healthy- 274 ± 153 ms and $12,26 \pm 5,40$ dB.

Conclusions: Average of the wave sound amplitude was shorter comparing to healthy individuals($p < 0,001$). Factors, statistically significantly related with not detected openings using sonotubometry were severe hypertrophy of inferior turbinate's, B type tympanogram and the character of the tympanic membrane retraction. More frequent ET dysfunction was found for the patients with retraction of pars tensa of tympanic membrane (0,038).

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ID: IP112

Extensive supporting cell proliferation and mitotic hair cell generation through genetic reprogramming process

Presenting Author: **Wenyan Li**

Wenyan Li, Wenli Ni, Huawei Li

Affiliated Eye and ENT Hospital of Fudan University

Learning Objectives:

The activation of cochlea progenitor cells is a promising approach for hair cell (HC) regeneration and hearing recovery. The mechanisms underlying the initiation of proliferation of postnatal cochlear progenitor cells and their transdifferentiation to HCs remain to be determined. We show that Notch inhibition initiates proliferation of Wnt-responsive Lgr5 + progenitor cells and mitotic regeneration of HCs in neonatal mouse cochlea *in vivo* and *in vitro*. We demonstrate that Notch inhibition removes the brakes on the canonical Wnt signaling and promotes Lgr5 + progenitor cells to mitotically generate new HCs. While, by down-regulating Notch signaling, the proliferated supporting cells (SCs) and mitotic generated HCs mainly located at the apex region of cochlea, which usually lose less hair cells compared to the base region of cochlea. For pursuing the extensive proliferation and hair cell generation needed for hearing recovery, we genetically reprogramed the SCs by activating the β-catenin to up-regulate Wnt signaling, deleting the Notch1 to down-regulate Notch signaling and overexpressing the Atoh1 in $Sox2^+$ SCs in neonatal mouse cochleae, as we show here that the extensive proliferation of SCs followed by mitotic HC generation is achieved. Our study reveals a new function of Notch signaling in limiting proliferation and regeneration potential of postnatal cochlear progenitor cells, and provides a new strategy to regenerate HCs from progenitor cells by genetically reprograming SCs with defined genes involved in HCs formation.

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ID: IP113

Middle Ear Adenoma: rare entity, life-long surveillance

Presenting Author: **Shueh Lim**

Shueh Lim[1], John Crowther[2], Georgios Kontorinis[2]
[1]*Royal Hospital Sick Children Glasgow,*
[2]*Queen Elizabeth University Hospital, Glasgow*

Learning Objectives: Middle ear adenomas are rare benign tumours. Surgery remains the mainstay of treatment. Longterm follow up should be carried out. Middle ear adenoma should be included in the differential diagnosis of middle ear mass in patients with persisting, non-specific symptoms.

Introduction: Middle ear adenoma is a low-grade neoplasm with the potential for recurrence and metastases. Clinical and radiological findings can be misleading and often fail to provide the right diagnosis. Our objective is to present our experience over a 10 year period.

Methods: A retrospective review of all middle ear pathology at our tertiary referral centre with a catchment area of over three million over the last 10 years was carried out.

Results: In total, only three patients were identified (prevalence 1:1,000,000), two male one female. Common symptoms of presentation included conductive hearing loss, aural pressure and autophony. Detailed imaging (computed tomography, magnetic resonance imaging complimented by angiography) was employed to better characterize the lesion and help with surgical planning. All patients underwent middle ear/ lateral skull base surgery. One patient had revision surgery for recurrence. Because of the neuroendocrine nature of ME adenomas, all patients remain under postoperative surveillance.

Conclusion: Our experience is similar to published literature. Adenomas of middle ear are indistinguishable benign tumours; surgical excision should be carried out to ensure complete excision.

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ID: IP114

Intracranial Complications from Chronic Otitis Media

Presenting Author: **Richard Locke**

Richard Locke[1], John Crowther[2], William Taylor[3], Georgios Kontorinis[2]
[1]*Queen Elizabeth University Hospital, Glasgow,* [2]*ENT Department, Queen Elizabeth University Hospital, Glasgow,* [3]*Neurosurgery Department, Institute of Neurosciences, Queen Elizabeth University Hospital, Glasgow*

Learning Objectives: Intracranial complications from middle ear disease Patterns of presentation Management of intracranial complications

Middle ear disease remains relatively common in the UK population with a previous study revealing the prevalence of inactive chronic otitis media to be 2.6% and active chronic otitis media to be 1.5% in the adult population. The incidence of intracranial complications from middle ear disease has fallen, however these life threatening complications are often diagnosed late and need to be treated aggressively.

We performed a retrospective analysis of patients referred to a tertiary neurosurgical centre with intracranial complications from both mucosal and squamous middle ear disease. The case notes and imaging were reviewed for comparison. Patient age, symptom duration, type of middle disease, management, complications and outcomes were determined. The results were then compared with a similar analysis performed at the same institution 20 years previously.

The majority of patients had active squamous otitis media. Previous surgical treatment of cholesteatoma did not prevent development of intracranial complications when there was recurrent disease. Meningitis was the predominant intracranial complication with venous sinus thrombosis and abscess rates lower. One patient developed a false aneurysm of the internal carotid artery from active mucosal otitis media.

There has been little change in the range of complications encountered over the past 20 years. For conditions such as false aneurysms, advances in interventional radiology have led to improved outcomes.

We present these cases to highlight the issues regarding diagnosis and management of patients with intracranial complications from chronic middle ear disease. High index of suspicion and aggressive surgical treatment remain essential as delay in diagnosis or treatment can be catastrophic.

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ID: IP115

Cholesteatoma: How it grows and where it goes, and how we should therefore approach its surgery: An analysis of data collected prospectively on 516 cases.

Presenting Author: **James Loock**

James Loock
University of Stellenbosch

Learning Objectives:

Introduction: While all otologists operate on cholesteatoma, little analysis exists of the patterns of disease spread which logically should dictate surgical approaches. Nor has comparison been made between different parts of the world.

Method: A detailed data-base was prospectively collected on every cholesteatoma surgery in Tygerberg Hospital between 2003 and 2016 (n = 516). This included *inter alia* the cholesteatoma's origin from the tympanic membrane, and its presence/not in all parts of the mesotympanum, epitympanum and mastoid. This data is analysed for the various sites and subsites and the site of origin of the cholesteatoma.

Results: Surprisingly, the tympanic membrane origin was: pars flaccida 27%, pars tensa posterior-superior marginal 29%; pars tensa central 30 %; and indeterminate 13% (some had multiple origins).