no primary reconstruction, and to compare the outcomes of Type III cartilage tympanoplasty with published results of other reconstruction methods.

Methods: The records of 160 patients from a single surgeon's 12-year cohort were retrospectively analysed. Postoperative changes in air conduction thresholds (0.5, 1, 2 and 4kHz and average gains) and air-bone gap were calculated for each operated ear 2 years after surgery according to AAO-HHS guidelines. Revision surgery and other complications were documented.

Results: Audiometric and other outcomes are presented in detail

Conclusions:

1. The vast majority of patients in whom primary reconstruction was not performed did not require further surgery, as the development of a natural Type III tympanoplasty preserved or improved hearing thresholds following primary disease elimination.
2. Type III cartilage tympanoplasty is an effective technique for hearing improvement in patients with an intact, mobile stapes. Results are similar to those obtained with partial ossicular replacement prosthesis and autologous bone ossiculoplasty, and have the added benefits of lower cost and a lower complication rate.
3. Our recommmendations for management of isolated stapes are based on these results.

doi:10.1017/S0022215116007003

ID: IP204

Otological aspects of undergraduate otolaryngology education in the United Kingdom

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Learning Objectives:

Introduction: Studies show that not all UK medical schools have a formal otolaryngology attachment, that the time dedicated to teaching in those which do is comparatively small and that qualified doctors feel that their training was inadequate.

Avoiding curriculum overload is a challenge in the ever expanding field of medicine. It would therefore be advantageous to identify and include key aspects of a subject within a curriculum. Here we report the otological findings from a national curriculum development project.

Methods: A longitudinal transformation approach to mixed methods research was utilised. The undergraduate curricula from UK medical schools were evaluated. Results from this comparison were used to devise a questionnaire. This was distributed nationally via email to establish what doctors felt a newly qualified doctor should know about otolaryngology.

Results: A curriculum comparison of 19 medical schools revealed a high degree of variability between undergraduate otolaryngology curricula.

308 survey responses were received. Doctors felt that graduates should be able to perform otoscopy (93%) and tuning fork tests (78%). Respondents indicated that graduates should understand indications for common audiological investigations but not to interpret the results.

Respondents felt graduates should be able to assess a patient with chronic otitis media. Results indicate graduates should know more about conditions which present acutely.

Doctors felt that graduates should understand indications for otological procedures but few felt that they should have observed these. Respondents also felt that it was important for graduates to learn about the implications of hearing loss and communication with hearing impaired individuals.

Conclusions: This method of curriculum development allows the end users, the doctor, to influence the content of the curriculum. The study shows the variability in otolaryngology teaching in the UK and highlights key areas for student learning.

doi:10.1017/S0022215116007015

ID: IP205

The effects of saccular endolymphatic hydrops on hearing

Presenting Author: **Satofumi Sugimoto**

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Learning Objectives:

Introduction: Patients with significant endolymphatic hydrops (EH) sometimes show a connection between the footplate and the dilated saccule. It was supposed that this connection might cause the low-frequency air-bone gap in Menière's disease. The purpose of this study was to investigate the effects of significant EH showing a footplate-saccule connection on hearing, particularly for low-frequency air-bone gaps.

Methods: Evaluations were conducted using 1996 ears, evaluated by 3-T MRI performed 4 ;h after intravenous injection of Gd. The degree of EH in the vestibule and cochlea was classified into three grades: none; mild; or significant. Findings of the connection were checked. Ninety-one ears showed the connection. After elimination of ears with middle or inner ear abnormalities and severe hearing loss, 60 ears with the connection were evaluated. We selected those patients who had one ear with the connection and the other with significant EH of the vestibule and/or cochlea

without the connection. Hearing between each ear was then compared using the t test.

Results: Significant differences between ears with the connection and ears with significant EH of the vestibule and/or cochlea without the connection were seen for air-bone gap at 250 ;Hz and 3 pure-tone averages (500-, 1000- and 2000-Hz thresholds). Low-frequency air-bone gaps improved after EH medication in some patients.

Conclusions: Ears with significant EH that show a footplate-saccule connection are associated with not only sensorineural hearing impairment, but also low-frequency air-bone gap. Changes in low-frequency air-bone gaps might reflect this aspect of EH.

doi:10.1017/S0022215116007027

ID: IP206

Expression pattern of WOLFRAMIN, the Wolfram syndrome 1 (WFS1) gene product, in the Common Marmoset (Callithrix jacchus), a non-human primate, cochlea

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Learning Objectives:

Introduction: Wolfram syndrome is an autosomal recessive disorder, known as DIDMOAD (Diabetes Insipidus, Diabetes Mellitus, Optic Atrophy, and Deafness) syndrome. Its causative gene, WFS1, encodes an 890 amino acid protein, called WOLFRAMIN, which maintains calcium homeostasis and unfolded protein responses in the endoplasmic reticulum (ER). Limited literatures describing temporal bone pathology display loss of hair cells in the basal turn and atrophy of stria vascularis in the apical turn. However, the expression of Wolframin in mice was distributed widely and uniformly in the sensory epithelium and was absent in the stria vascularis. Moreover, WFS1 knockout mice did not suffer deafness.

Learning objectives: In order to elucidate the discrepancy of the phenotype among species, and to explore the pathophysiology of deafness associated with WFS1 mutations, we examined expression of WOLFRAMIN in a non-human primate, common marmoset (Callithrix jacchus), cochlea.

Methods: We examined the expression pattern of WOLFRAMIN with double staining of WFS1 with other markers. The primary antibodies used are as follows: anti-WFS1 (rabbit IgG), anti-MYOSIN7a (mouse IgG), anti-CALDESMON (mouse IgG), and anti-CONNEXIN26 (CX26) (mouse IgG).

Results: In marmoset cochlea, WFS1 immunoreactivity was observed in basal cells of stria vascularis, type I fibrocytes, outer hair cells, outer sulcus cells, Claudius cells, Hensen cells, and spiral ganglion. Immunostaining for WFS1 was co-labled with type I fibrocytes markers, CX26 and CALDESMON. In stria vascularis, immunoreactivity for WFS1 was co-labeled with a basal cell marker, CX26.

Conclusions: The expression pattern of WFS1 in common marmoset cochlea was different from that of mouse. The pattern suggests basal cells may play essential roles in the maintenance of stria vascularis. Clarifying the function of basal cells of primates, including human, may elucidate pathogenesis of hearing loss in Wolfram syndrome patients.

doi:10.1017/S0022215116007039

ID: IP207

The canal wall down procedure with soft posterior meatal wall reconstruction in acquired cholesteatoma. Focus on recurrence and postoperative middle ear status

Presenting Author: **Tomoyasu Tachibana**

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Learning Objectives:

Introduction: The aim of procedures performed for acquired cholesteatoma (AC) is the complete removal of lesions, the prevention of disease recidivism, and the restoration of hearing loss. Although two main surgical procedures are canal wall up and canal wall down tympanoplasty (CWDT), it remains controversial which procedure would be appropriate for AC.

Objectives: To review surgical results of CWDT with soft posterior meatal wall reconstruction (SWR) for AC and to identify factors associated with surgical outcomes.

Methods: A retrospective review was made of 119 (flaccida, 99; tensa, 20) ears with AC who underwent CWDT with SWR at Himeji Red Cross Hospital between 2002 and 2015. The mean age was 45 years. The mean postoperative follow-up was 65 months (range, 12 to 156 months). Analyzed factors included sex, age, the type and extent of AC, the type of ossiculoplasty, and so on. We defined postoperative balloon-like retraction (PBR) with web formation, which needed reoperation to clean accumulated earwax, as 'nearly' recurrence. We classified all cholesteatetomas according to JOS staging system for middle ear cholesteatoma (2015).

Results: Stage I and II were 24 and 95 ears, respectively. Residual was found in 11 ears (9.2%). Of 44 ears with PBR with web formation, 7 ears (5.9%) showed nearly recurrence. Seven residual and 4 nearly recurrent ears underwent