

*Learning Objectives:* 1) To identify the rate of false positives and false negatives in our patients by correlating the radiological findings of D2-weighted MRI with intra-operative findings in patients with primary and recurrent cholesteatoma. 2) To determine the value of D2-weighted MRI in preventing the need for second-look surgery. 3) To determine whether a specific diameter of lesion observed on MRI can be established in order to predict the clinical significance of recurrent cholesteatomas.

*Introduction:* There has been increasing evidence that demonstrates the accuracy of non-echo-planar diffusion-weighted magnetic resonance imaging in the identification of cholesteatoma. This retrospective study aims to determine if the sensitivity and specificity of D2-weighted MRI used to evaluate the presence and recurrence of cholesteatoma, in the North of Scotland, is coherent with current published literature.

*Method:* Retrospective collection of data between January 2012 to December 2015 was conducted on patients that have undergone cholesteatoma surgery using operation codes and the review of theatre diaries. Electronic records of D2-weighted MRI findings and operative notes were reviewed and compared for comprehensive analysis. Results were then quantified in order to identify measurable outcomes (eg specificity, sensitivity).

*Results:* 41 of 235 patients whom had gone under tympano-mastoid surgery were confirmed to have received D2-weighted MRI. The results of this study are predicted to be concurrent with recent published data with a similar degree of sensitivity and specificity.

*Conclusion:* The high degree of accuracy in D2-weighted MRI observed will continue to decrease the need for second-look surgery in the North of Scotland. Data accumulated will provide additional evidence in the reliability of D2-weighted MRI to predict the clinical significance of recurrent cholesteatomas.

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#### ID: IP023

##### Applied FESS posture in TEES cholesteatoma surgery

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*Learning Objectives:* As the frequently encountered condition of the cholesteatoma visible but out of reach in TEES with conventional instruments, the curved instruments and angular endoscopes are gradually developed and adopted in clinical practice. The cadaveric practice is essential to get used to operate together with curved instruments and angular endoscopes in narrower EAC of asian people. The frontal sinus FESS-like posture not only place the endoscope at safer place of hypotympanum but also

acquire more operation fields of attic/antrum and prevent doing harm to facial nerve and stapes as the conflict of endoscope and instrument in right ear surgery. With flexible-tip endoscope inspection of attic/antrum and regular post-operative follow up, the minimal invasive TEES, a.k.a Functional EES cholesteatoma surgery could be achieved on the limited cholesteatoma, increasing proportion in the developed country like Taiwan.

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#### ID: IP024

##### Characteristic of geno-phenotype on GJB2 p.V37I Variant Knock-in Mice

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*Learning Objectives:* To explore the phenotype of mice segregating the highly prevalent human GJB2 p.V37I variant and their differently expressed genes.

*Materials and Methods:* Mice from the same brood separately were divided into p.V37I Knock-in group with poorer hearing (KI, n = 10) and wild-type group (WT, n = 10). ABR was practiced every four weeks from 6-week-old to 50-week-old. Cochlears were dissected separately from 50-week-old mice for confocal immunofluorescence to count the number of hair cell. Another six 5-day-old mice also from same brood of each group were killed for cochlear. The RNA of harvested tissues were extracted and examined for analysis of Illumina MouseWG-6 v2 Expression Beadchip to compare the expression patterns by groups. Q-PCR were prepared for validation for results of the Mice Beadchip.

*Results:* KI group revealed progressive hearing loss from 30-week-old compared with WT group ( $P = 0.002$ ), especially on frequencies of 4k, 24k and 32kHz. After dyeing by confocal immunofluorescence, it was found that 3 of 100 hair cells of middle and apical turn were missing under each field of microscope in KI group. The beadchip identified 929 up-regulated and 897 down-regulated expressed genes compared KI with WT group. Genes expressed in the

cochlear from the ten most differently bi-regulated candidate genes were chosen for further q-PCR validation. As a result, *Fcer1g*, *Nnmt*, *Lars2* (up-regulated) and *Cuedc1* (down-regulated) genes were proved to be differentially expressed between KI and WT group.

*Conclusion:* *GJB2* p.V37I KI mice presented progressive late-onset hearing loss with depletion in numbers of hair cell. *Fcer1g*, *Nnmt*, *Lars2* and *Cuedc1* genes were proved to be differentially expressed between KI and WT group.

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## ID: IP025

### An ear microsurgery trainer for low-resource settings

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#### Learning Objectives

*Introduction:* The World Health Organisation has identified chronic suppurative otitis media as a neglected condition affecting up to 330 million people worldwide, the burden of the disease located in impoverished countries. There are huge socioeconomic implications that support any progress towards the correct management of otorrhoea. The recent Lancet Commission on Global Surgery highlighted the need for NGOs to hardwire training into their programmes and that low cost simulation would be one avenue by which this might be achieved. With this in mind, we aimed to develop an ear surgery simulator appropriate for training in resource poor settings and to demonstrate its effectiveness in facilitating acquisition of headlight and microsurgical skills necessary to perform procedures via the ear canal, safely.

*Methods:* A low-fidelity ear trainer was designed to emulate the ear canal and middle ear space. Face validity was assessed via questionnaires. Six tasks were developed, from headlight foreign body removal through to microscope-orientated tasks of foreign body removal, ventilation tube insertion, tympanomeatal flap raising, myringoplasty, and middle ear manipulation skills.

Novices (medical students), those with limited otology experience (junior ENT doctors) and experts (consultant otologists) were video-recorded performing each task. Videos were scored by a blinded observer, using a validated measurement tool and specially adapted task-specific checklist, in order to assess construct validity.

*Results:* Face validity results confirmed that ET was a realistic representation of the ear. Construct validity results showed a statistically significant trend with experts

performing better than those with limited experience performing better than novices.

*Conclusion:* This study validates ET as a useful training tool to assess headlight and microsurgical skills required to perform otologic procedures. Further testing is now planned in the developing world setting.

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## ID: IP026

### Bioactive glass for obliteration after subtotal petrosectomy

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*Learning Objectives:* Bioactive glass granules can be used as an alternative filler material for obliteration after subtotal petrosectomy.

*Introduction:* Subtotal petrosectomy for chronic suppurative otitis media requires obliteration of the mastoid cavity and middle ear space. Generally, abdominal fat is used for this purpose. A considerable risk of using fat is infection, which might require revision surgery. The use of bioactive glass granules seems an attractive alternative since the granules have antibacterial properties.

*Methods:* A 59 year old male patient with a history of chronic suppurative otitis media of the right ear, complicated by a sudden profound perceptible hearing loss was already treated with a mastoidectomy 6 years ago and thereafter extensively treated conservatively. Because of recurrent chronic otorrhoea and pain we decided to perform a subtotal petrosectomy with blind sac closure of the external ear canal, closure of the Eustachian tube, and obliteration of the cavity with S53P4 bioactive glass granules (BonAlive Biomaterials Ltd., Turku, Finland). A wound drain was kept in place for 7 days.

*Results:* No complications occurred peri-operatively and a dry ear was obtained with complete relief of pain. Duration of follow-up is now 6 months and no late adverse events were observed.

*Conclusions:* S53P4 bioactive glass granules are feasible to use for obliteration after subtotal petrosectomy. Elimination of chronic suppurative otitis media can be achieved with this technique. Bioactive granules might be an alternative for abdominal fat, which has a risk of infection.

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## ID: IP027

### Long-Term Hearing and Functional Outcomes and Complications after Ossiculoplasty