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**ID: IP072****A New Simple Radiological Scoring System for Classifying the Tegmen of the Mastoid**Presenting Author: **Sherif Idris**Sherif Idris, Youness Elkhaldy, Ravi Bhargava, Allan Ho  
*University of Alberta**Learning Objectives:*

1. Variations in normal tegmen and inner ear anatomy.
2. Surgical considerations when operating near the tegmen.

*Introduction:* The tegmen is a thin, variable plate of bone that separates the mastoid and middle ear cavity from the intracranial compartment. Because of its location, serious complications such as cerebrospinal fluid leakage and neural tissue damage may arise when operating near the tegmen. One important risk factor for dural complications is low placement of the tegmen. This study aims to determine the radiographic location of the tegmen tympani using the lateral semicircular canal as a landmark in adult patients with normal temporal bones.

*Methods:* 100 high resolution temporal bone CT scans from patients worked up for hearing loss were examined retrospectively. We included scans from adult patients with normal temporal bone anatomy and no previous ear surgery. The distance between the lateral semicircular canal and the lowest point of the tegmen tympani was measured in both the sagittal and coronal planes. 60 patients with cholesteatoma having undergone mastoidectomy procedures within the past 6 years were also analyzed retrospectively.

*Results:* The mean tegmen height was 4.1 mm in the coronal plane and 2.5 mm in the sagittal plane. The measured heights demonstrated a unimodal distribution with some variance.

*Conclusions:* We propose a simple and practical tegmen classification scheme. Tegmens below 4.5 mm on coronal measurement and 2.5 mm on sagittal measurement are considered “low” (type A) whereas tegmens above these parameters are considered “high” (type B). This classification system applied to preoperative temporal bone CT might influence planning of middle ear and mastoid surgery. For instance, from our retrospective analysis of recent mastoidectomy patients, “low” tegmens were more likely to require a canal wall down mastoidectomy whereas “high” tegmens were more likely to require a canal wall up mastoidectomy.

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**ID: IP073****Anatomical findings of bony portion of Eustachian tube**Presenting Author: **Ryoukichi Ikeda**Ryoukichi Ikeda<sup>1</sup>, Hiromitsu Miyazaki<sup>1</sup>, Tetsuaki Kawase<sup>2</sup>, Yukio Katori<sup>2</sup>, Toshimitsu Kobayashi<sup>1</sup><sup>1</sup>Sen-En Rifu Hospital, <sup>2</sup>Tohoku University  
*Otolaryngology-Head and Neck Surgery**Learning Objectives:*

*Introduction:* The Eustachian tube (ET) consists of an osseous and a cartilaginous part which measure one thirds to two thirds of the overall length, respectively. Savic et al. reported that the shapes of bony portion of ET are divided into three groups (triangular, rectangular and irregular).

*Methods:* Bony portion of ET was examined by computed tomography (CT) in patulous Eustachian tube, chronic inflammation middle ear diseases and control group. The aeration of mastoid was also examined.

*Results:* The group with poor aeration of mastoid is significantly higher rate of triangular shape than good aeration group. In addition, the bone between cochlea and carotid artery in poor mastoid aeration group is thicker than good aeration group.

*Conclusions:* The shapes of the tympanic orifice and bony portion of the ET are various. The shapes of bony portion of ET are related to aeration of the mastoid cell. It is important to evaluate bony portion of ET before transtympanic ET surgery.

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**ID: IP074****Subtle open-type congenital cholesteatoma should be distinguished from congenital ossicular anomaly -Endoscope assisted microscopic trans canal approach-**Presenting Author: **Amiko Ishii**

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*Japanese Red Cross Medical Center**Learning Objectives:*

*Introduction:* Open-type congenital cholesteatoma (OCC) of the middle ear is relatively rare. It is also difficult to diagnose correctly preoperatively because the clinical presentation is very similar to that of congenital ossicular anomaly (COA). Here, we present a case report of middle ear OCC masquerading as COA.

*Case presentation:* A 12-year-old Japanese boy with a history of imperforate anus and spinal anomalies presented with a 1.5-year history of left-sided hearing loss. The external auditory canal and tympanic membrane were normal on both sides. Pure tone audiometry showed a 44-dB conductive hearing loss. High-resolution temporal bone computed tomography (TBCT) showed a defect in the long process of the incus and the stapes suprastructure, and a small shadow near the stapedial tendon. An endoscope-assisted microscopic transcanal approach was used to identify the

ossicular defect (as expected) and an OCC extending from the stapedial tendon to the promontory. We removed the entire OCC and reconstructed the ossicular chain with tragal cartilage. The postoperative air–bone gap was 9.4 dB.

*Conclusions:* OCC often presents in a way very similar to COA, with conductive hearing loss and an intact tympanic membrane. However, a history of progressive hearing loss and the presence of a subtle soft tissue density on TBCT are suspicious of OCC, rather than COA, in which the hearing loss is of a congenital nature. In this patient, the cholesteatoma was located in the sinus tympani around the stapedial tendon and was difficult to assess with an operating microscope. In lesions of the sinus tympani and facial recess, endoscope-assisted microsurgery can facilitate cholesteatoma removal and reduce the risk of recurrence.

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### ID: IP075

#### **Interaction between keratinocytes and fibroblasts induces osteoclastogenesis: a mechanism underlying cholesteatoma-induced bone destruction**

Presenting Author: **Yoriko Iwamoto**

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#### *Learning Objectives:*

Bone is a highly dynamic organ, which is maintained by a balance between bone-resorbing osteoclasts and bone-forming osteoblasts. Increased osteoclast activity shifts the balance toward bone resorption, cause bone destructive diseases such as rheumatoid arthritis and periodontitis. Ectopic induction of receptor activator of nuclear factor kappa-B ligand (RANKL), a regulator of osteoclast differentiation, leads abnormal osteoclastogenesis. For example, in rheumatoid arthritis, synoviocyte is known as a major source of RANKL.

Cholesteatoma is a non-neoplastic lesion arising in middle ear, which consists of hyperkeratinizing epithelial layer and fibrous connective tissue. Due to its bone destructive character, it can cause severe complications. However the mechanism of the bone destruction by cholesteatoma remains to be elucidated.

In this study, we established cholesteatoma-like mass composed of mouse ear pinna-derived keratinocytes and fibroblasts on the calvarial bone of mouse. Histological analysis revealed the experimental mass lesion induced osteoclastogenesis on the bone surface. In addition, we succeeded in establishing an in vitro coculture system of keratinocytes, fibroblasts and osteoclast precursors, and found that keratinocytes stimulate the induction of RANKL in fibroblasts, which leads to osteoclastogenesis.

Thus, this study demonstrates that interaction between keratinocytes and fibroblasts is involved in the differentiation of osteoclasts, which may provide the molecular basis of a new therapeutic strategy for cholesteatoma-induced bone destruction.

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### ID: IP076

#### **LION Surgery Broadcasts: Communal viewing benefits with perceived quality of transmission, surgery and discussion**

Presenting Author: **Steve Backhouse**

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*Learning Objectives:* To improve otological surgical knowledge & techniques.

The Live International Otolaryngology Network (LION) aims to promote high quality medical and continuous surgical education programmes, seeking to improve knowledge and skills of practicing otolaryngologists. LION's purpose is to achieve a worldwide permanent interactive network within ENT, promoting distant learning using videoconferencing technology. Theoretically internet webcasts provide a cost effective, environmentally friendly way for otolaryngologists to access CPD.

Preparations were made on the 12<sup>th</sup> May 2015 in order to maximise this opportunity in South Wales for ENT surgeons and allied health professionals. We organised a 'communal' viewing to promote open discussion between allied professionals in attendance and assess the educational experience by targeted questionnaires to give validity for CPD accreditation by RCSEdinburgh and ENTUK. 15 delegates attended (5 ENT consultants, 6 ENT trainees, 1 ENT SAS, 2 audiologists & 1 audiology student). 71% had watched a LION broadcast previously and all felt that the communal broadcast was better than viewing alone, that they would re-attend a communal LION broadcast in the future, and would recommend such to a colleague. Perceived broadcast transmission quality, surgical technique and discussion were generally good across both channels.

Communal viewing of the LION broadcast was well received by all delegates. The following improvements were suggested: wider advertisement, simultaneous screening of broadcast channel 1 and 2, and a second screen in each room for background information/ case studies. Although the numbers are small, feedback for individual surgeons and procedures will allow quality assurance and improvement for the next broadcast.

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### ID: IP077

#### **Climbing up the learning curve in totally endoscopic cholesteatoma surgery**

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