

Learning Objectives: The endoscopically assisted surgery of the middle ear is widely used in the world for over 20 years. The aim of the study was to assess the application of this method in comparison to the standard microscopic tympanoplasty in terms of the tendency to recurrence of cholesteatoma.

The endoscopically assisted surgery of the middle ear is widely used in the world for over 20 years. The aim of the study was to compare the use of this method compared to the standard microscopic tympanoplasty in terms of the tendency to recurrence of cholesteatoma.

The study included 45 patients operated in the years 2009 to 2010 due to cholesteatoma. All patients had made canal wall up tympanoplasty with posterior tympanotomy and removing the cholesteatoma from the middle ear. Reconstruction of the tympanic membrane and ossicular chain were performed as needed. Additionally application of endoscope in study group allowed to visualize and removing of the matrix of cholesteatoma from the recesses of the tympanic cavity. We compared the results of treatment of patients five years after the first operation.

To the study group were enrolled twenty-five patients and twenty to the control group. During five years after surgery, again we operated on sixteen subjects in the study group (66%) and ten from control group (50%). The reason of second-look procedure was uncontrollable retraction pocket or apparent recurrence in the pocket in six patients from the study group (24%) and in one case from the control group (5%). The further persons had carried out second-look tympanoplasty to check the tympanic cavity and to perform ossiculoplasty.

The presence of cholesteatoma during reoperation were found in nine individuals in the study group (37.5%) – six recurrences from the retraction pockets (24%) and three residual cholesteatoma in the recesses of tympanic cavity (12%). In the control group the cholesteatoma was found in only two cases (10%). The recurrence from the retraction pocket in one patient (5%) and the residual of cholesteatoma in one person (5%).

We conclude that developed otosurgical technique is the basis of the satisfactory results of treatment. Additional tool is not affected a in crucial way for improving results in terms of score of residual cholesteatoma.

doi:10.1017/S0022215116005879

ID: IP091

The development of a new 3D printed temporal bone model and it's comparison to other training models

Presenting Author: **Anand Kasbekar**

Anand Kasbekar¹, Gopinath Narasimhan², Tristram Lesser²

¹Cambridge University Hospitals NHS Foundation Trust, ²Aintree University Hospitals NHS Foundation Trust, Liverpool, UK

Learning Objectives: To develop a 3D printed temporal bone that can be used as a training model and to compare it against the Pettigrew bone model, the Voxel-Man virtual reality model and a cadaveric temporal bone.

Introduction: There is a need for realistic temporal bone (TB) models for dissection by trainees in otolaryngology. Three

dimensional (3D) printers provide a method of replicating realistic models. We have developed the first UK 3D TB model (3D model) to our knowledge and compared it to a Pettigrew model (PM), Voxel-Man virtual reality model (VMM) and a cadaveric TB model (CM).

Methods: The production of the 3D model will be discussed using an Object 3D printer. Different colours and materials were used to enhance realism. A senior ENT trainee and post CCT fellow separately dissected and rated the 4 models assessing their realism to a live TB dissection using a 5 point rating system.

Results: The cadaveric model was the closest to a living TB in all category ratings. Amongst the other models, the 3D model rated excellently for “anatomical feel” but due to technical difficulties in the manufacturing process anatomical accuracy was poor. Pros and cons of each of the models are discussed including how the 3D model will be improved to an acceptable standard for ENT trainees to dissect.

Conclusions: With improved manufacturing of the 3D model, trainees will have access to relatively cheap, high quality models to dissect. All models evaluated have varying benefits to the trainee dependant on the stage of their training. The 3D model will be utilised in the region's training programme in the future.

doi:10.1017/S0022215116005880

ID: IP092

How to achieve a dry care free mastoidectomy cavity

Presenting Author: **Udi Katzenell**

Udi Katzenell¹, Rona Bourla², Doron Halperin²

¹Kaplan Medical Center, ²Kaplan Medical Centre, The Department of Otolaryngology Head and Neck Surgery, Affiliated to the Faculty of Medicine of the Hebrew University of Jerusalem

Learning Objectives:

Objectives: This study investigates the clinical results of canal wall down mastoidectomy (CWDM).

Methods: The clinical records of patients who had primary or revision canal wall down mastoidectomy between 9/2011 and 12/2015 in Kaplan Medical Center were reviewed. All surgeries were performed in a uniform technique by two experienced surgeons.

Results: 39 patients had CWDM with the average age of 34 years (5–87). 72% (28) were male and 11 (28%) were female. For 51% (20) it was a revision surgery. 46% (18) had a contralateral pathology and 7(18%) had contralateral surgery. 7% (2) had recurrence of the cholesteatoma after surgery. The Nadol cavity grading after surgery was grade 0 (No discharge events and no granulations) in 71% (22) of the patients, grade 1 (one event of discharge which is shorter than two weeks in the past three months or no discharge with a sensation of a wet ear) in 13% (4) and grade 2 (persistent

discharge or granulations in examination or a need for revision surgery) in 16% (5) patients. We did not have enough information to determine the Nadol grading for 5 patients. 35% (14) did not practice water precautions of whom only one experienced a vestibular effect. 10% (4) used a hearing aid, one had a Bone Anchored Hearing Aid and one had a Bonebridge.

Conclusions: CWDM is reserved for aggressive or recurrent cholesteatoma. We believe that the following are essential for the achievement of a dry care free cavity with a low recurrence rate and rare vestibular effect: evacuate all mastoid air cells, avoid overhangs of the tegmen, drill the sinudural angle, amputate the tip, lower the facial ridge, drill down the inferior part of the tympanic bone, smoothen obliterate the mastoid cavity with bone pate, perform an adequate miatoplasty and use an antiseptic dressing like BIPP. Most patients continue to practice water precautions although the cavity is dry and do not accept hearing rehabilitation with a hearing aid or a bone anchored hearing device.

doi:10.1017/S0022215116005892

ID: IP093

The application of surgical simulation system in the middle ear surgery

Presenting Author: **Jia Ke**

Jia Ke¹, Furong Ma², Shaoxing Zhang², Shilong Sun²

¹Peking University Third Hospital,

²Department of Otorhinolaryngology Head and Neck Surgery, Third Hospital, Peking University

Learning Objectives:

Objectives: To probe into the characteristics and applications of the Voxel-Man TempoSurg in middle ear surgical procedures.

Methods: 40 middle ear surgical procedures were selected with videos of the routine surgical procedures reserved. Then simulated procedures were done as the real procedures in the operation. Depending on the different viewing angles, the above cases were classified as three methods: A. Different types of middle ear surgery; B. Different types of mastoid pneumatolysis. C. Different surgical methods (canal wall up or canal wall down). The appearances of the important structures were recorded and compared both in the real procedures and the simulated procedures.

Results: 1. For different middle ear surgeries, the simulator can truly reflex the surgical situations in diseases mostly with bone structure lesions; 2 Recognitions of anatomic structures are easier in better pneumatic mastoids. 3. Recognitions of anatomic structures are almost the same in different procedures with different surgical methods.

Conclusion: Otologic simulator can be used in difficult middle ear surgeries mainly with bone lesions and it can be used in pre-operation and path planning to increase the safety of the surgery.

doi:10.1017/S0022215116005909

ID: IP094

Cone-Beam CT compared to Multi-slice CT for the diagnostic analysis of conductive hearing loss, a pilot study

Presenting Author: **Jiska van Stralen**

Pieter Kemp¹, Jiska van Stralen¹, Pim de Graaf¹, Erwin Berkhout², Jan Wolff¹, Pepijn van Horssen¹, Paul Merkus¹

¹VU University Medical Center Amsterdam,

²Academic Center for Dentistry Amsterdam, department of Oral and Maxillofacial Radiology

Learning Objectives: Image quality is largely dependent on the pilot study parameters that have been used during scanning. Additional research will be performed to optimize the parameters for CBCT (and the MSCT) in imaging of the temporal bone. Thereafter, a new comparison in optimal settings between the NewTom 5 G (CBCT) and MSCT will be conducted.

Introduction: Multi-slice CT (MSCT) is commonly used as a diagnostic tool for patients with a conductive hearing loss. Recent studies indicate that Cone-beam CT (CBCT) may be used as a low radiation dose alternative for temporal bone imaging. However, limited data are available on the image quality of CBCT compared to MSCT (Casselmann, 2013; Theunisse, 2015). The aim of this study was to compare image quality and effective radiation dose of CBCT with MSCT.

Methods: Three human cadaver heads (six ears) were imaged on three CBCT scanners (NewTom 5G, Accuitomo 170 3D, PaX-Zenith 3D) and one MSCT scanner (Discovery CT750 HD Freedom Edition). Visibility of sixteen anatomical landmarks of the middle and inner ear were assessed by two observers on a 4-point Likert scale. Total scores of all landmarks, scores of subgroups (such as the ossicular chain) and individual landmarks were compared. Furthermore, effective radiation dose of the protocols was measured and compared.

Results: Image quality of MSCT and the NewTom 5 G were assessed as superior to the Accuitomo 170 3D and Pax-Zenith 3D ($P < 0.05$). No significant differences in image quality were found between the MSCT and the NewTom 5G. Similar results between scanners were found when comparing scores of the ossicular chain.

It seems that optimizing the scan settings could further improve the image quality of the NewTom 5 G CBCT.

Effective radiation dosages of CBCT protocols were around 25 percent of the clinical MSCT dose.

Conclusion: Image quality of the NewTom 5 G seems comparable to MSCT when scanning the temporal bone with special attention to the ossicular chain and conductive hearing loss landmarks. Furthermore, CBCT imaging results in a considerably lower effective radiation dose compared to MSCT.