

All cases presenting to the author have undergone surgical treatment and patients with middle ear disease and treated surgically within 2 months of presentation all showed some recovery in facial nerve function. In those with apical disease the palsy was often present for many years and facial nerve function did not improve but nor did it deteriorate post-operatively in these more long-standing cases.

Facial nerve palsy associated with cholesteatoma should be treated surgically as early as possible but recovery can still be anticipated, even if treatment is delayed for up to 2 months.

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Free Papers (F842)

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Initial clinical experience with the Nucleus CI532 Cochlear Implant Electrode

Presenting Author: **Robert Briggs**

Robert Briggs¹, Jason Gavrilis², Catherine Morgan², Frank Risi², Antje Aschendorff³, Chris James², Robert Cowan⁴

¹University of Melbourne, ²Cochlear Ltd,

³Universitätsklinikum Freiburg, Germany, ⁴The Hearing Co-operative Research Centre, Melbourne

Learning Objectives:

Objective: To evaluate the efficacy of the Slim Modiolar (CI532) array in delivering consistent scala tympani and perimodiolar placement of the electrode contacts in cochlear implant recipients.

Methods: The Nucleus CI532 device incorporates a new pre-curved, perimodiolar electrode array (EA32) with 22 contacts and a cross-sectional area of approximately 40% of that of the Contour Advance "CA" array with the same electrode length. The EA32 does not have a lumen and stylet like the current CA; instead it has a thin electrode which is introduced into the cochlea through a 0.7 mm diameter straightening sheath.

As part of a multicentre international clinical trial, 10 patients have received the CI532 implant at the Melbourne Cochlear Implant Clinic. Outcome measures have included intra-operative fluoroscopy and Neural Response Telemetry, Post operative Cone Beam CT and speech perception testing.

Results: Electrode placement was successful in all 10 recipients with confirmed Scala Tympani position and low wrapping factor indicating good perimodiolar proximity. Hearing performance at 6 months appears promising.

Conclusion: Initial clinical experience with the CI532 electrode has demonstrated successful placement in 10 patients without complication and excellent perimodiolar position.

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Otitis Media in children with cochlear implants - a long term prospective study

Presenting Author: **Noam Yehudai**

Noam Yehudai, Michal Luntz

Bnai Zion Medical Center, Technion – The Bruce Rappaport Faculty of Medicine, Haifa, Israel

Learning objectives: to determine the incidence of chronic otitis media in pediatric implantees and to define influencing factors.

Introduction: COM is considered a late sequela of both recurrent AOM and also of ventilating tubes. In children with a cochlear implant, the risks of middle ear infection and its potential spread along the electrode array into the cochlea and central nervous system are relatively high, mandating an aggressive management including insertion of ventilating tubes. Although the rate of AOM episodes diminishes after cochlear implantation, it remains high in otitis media (OM) prone children, thus might lead to repeated ventilating tube (VT) insertions. Information regarding the incidence of COM in children after cochlear implantation is scarce. The aim of the study is to determine the incidence of COM in pediatric implantees and to define influencing factors.

Methods: A retrospective study including 200 pediatric implantees. Mean age at CI was 32.58 ± 17.83 months and mean post-operative follow-up was 72.41 ± 35.27 months. Management was based on a structured AOM control protocol.

Results: 126 children (63%) were classified as OM prone and 74 (27%) as non-OM prone. 38 children (19%) underwent ≥ 2 VT insertions. Chronic OM developed in 15 children (7.5%). Seven children had a tympanic membrane perforation, 7 had adhesive middle ear disease and one more had cholesteatoma. Myringosclerosis appeared in 22 children (11%).

Discussion: Children after cochlear implantation continue to suffer from sequela of recurrent episodes of AOM. Significantly more myringosclerosis is found in OM-prone children who underwent repeated VT insertions. These children are also at increased risk for development of COM. OM-prone implantees should be followed carefully and continuously for early diagnosis and surgical intervention in cases of COM.

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Predictive factor for residual hearing preservation after conventional cochlear implantation

Presenting Author: **Masahiro Takahashi**

Masahiro Takahashi, Yasuhiro Arai, Naoko Sakuma, Kenichiro Yabuki, Daisuke Sano, Nobuhiko Oridate
Yokohama City University School of Medicine

Learning Objectives:

Introduction: The concept of cochlear implantation (CI) with hearing preservation by atraumatic soft surgery is well established. The preservation of residual hearing after conventional CI is also frequently observed. The purpose of this study was to investigate predictive factor for residual hearing preservation after atraumatic CI.

Patients: Twenty-six patients (13 adults and 13 children) included in this study were received CI with atraumatic technique using standard-length flexible electrode implant through the round window approach.

Main outcome measure: Residual hearing was defined by unaided preoperative pure-tone threshold by air conduction at the mean of frequencies 125, 250 and 500 Hz. Complete hearing preservation was defined as postoperative thresholds within 10 dB of pre-implant values, hearing loss was defined greater than 10 dB of pre-implant values. Preoperative magnetic resonance imaging (MRI) was undergone in all patients, to measure cochlear fluid using software package included in the electric medical chart system.

Result: Complete hearing preservation was achieved in 17 of 26 (65%) patients. Complete hearing preservation were observed in seven of 13(54%) adults and ten of 13 (77%) children. In the patients less than the age of 6, residual hearing preservation was significantly achieved compared to other patients ($p < 0.05$). The cochlear volumes were ranged between 60 and 108 mm³ in 26 patients. The mean cochlear volume was 81.7 mm³ in the group of the complete hearing preservation, 69.0 mm³ in the group of hearing loss, respectively. Cochlear volume was significantly larger in those with the complete hearing preservation than those with the hearing loss.

Conclusion: Residual hearing preservation after conventional CI was observed in patients with younger age at implantation and larger cochlear volume in the present study. Cochlear volume could be a useful tool in predictively for residual hearing preservation after conventional CI.

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Cone beam (CBCT) imaging in cochlear implantation practice

Presenting Author: **Emma Stapleton**

Emma Stapleton¹, E Mary Shanks², Agnes Allen², Peter Wardrop²

¹Scottish Cochlear Implant Centre,

²Crosshouse Hospital, Kilmarnock

Learning Objectives: 1) An introduction to CBCT imaging 2) A review of the relevant literature 3) A proposal of two models of cone beam imaging in cochlear implantation practice 4) To demonstrate these models using high quality images and explanations.

Introduction: Traditional methods of imaging in cochlear implantation practice include pre-operative MRI and high-resolution CT, to examine detailed anatomical structures and to define bony detail respectively, with post-operative modified Stenver's radiography to confirm electrode placement.

CBCT offers several potential advantages, including reduced radiation dose and minimal metal artefact compared to standard CT scanning. Additionally, there is evidence that electrode position may influence auditory outcome, hence the superior anatomical detail in CBCT offers a distinct advantage over plain radiography.

Methods: A review of the literature, and a summary of the potential uses of CBCT in cochlear implantation practice, as well as our department's current practice and experience, are presented.

Results: A number of studies have assessed the potential of cone beam imaging in determining cochlear implant electrode position in human cadaveric temporal bones.

CBCT offers distinct advantage over standard CT in the form of reduced radiation, reduced metal artefact and superior bony anatomical definition. However it is not suitable for use in young children or babies due to the need to sit upright and still.

Conclusions: Two models of CBCT usage in cochlear implantation practice are explained; both are currently being trialled by cochlear implantation units in the UK:

CBCT of the temporal bone both pre- and post-operatively in cochlear implant recipients offers high quality imaging for the assessment of both bony anatomy and electrode placement. MRI scanning is still required pre-operatively in many cases. Young children cannot be reliably imaged using CBCT due to movement artefact.

An alternative use of CBCT is in the pre- and post-operative assessment of selected cochlear implantation patients, including those with complicated pathology or anatomy, in whom a detailed analysis of anatomy and electrode position is advantageous in terms of their management and prognosis.

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Free Papers (F842)

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Computer assisted 3D planning for surgical placement of the Bonebridge bone conduction hearing implant, simultaneous implantation of epithesis anchors and audiological outcome in adults and children

Presenting Author: **Ingmar Seiwerth**

Ingmar Seiwerth¹, Florian Radetzki², Torsten Rahne³, Stefan Plontke³