Electrical auditory brainstem responses during cochlear implantation

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Objectives: The aim of this study was to investigate whether electrical auditory brainstem responses (eABR) obtained during cochlear implantation (CI) can predict CI outcomes. We also aimed to assess whether eABR can be used to select patients for auditory brainstem implantation (ABI).

Methods: The study was retrospective. The latencies and quality of the eABR waveforms from adult patients implanted with CI in Uppsala from 2011 to 2013 (n = 74) and four children with severe cochlear abnormalities were analyzed. Speech perception was assessed by postoperative monosyllabic word (MS-word) recognition. A score was constructed for each patient based on wave II, III and V latency.

Results: Wave V for the mid- and low-frequency regions on the implant was the most robust. eABR latencies increased towards base stimulation of the cochlea. Significant latency shifts occurred in wave V from the low- to high-frequency regions on the implant (P< 0.01) and from the mid- to high-frequency regions on the implant (P** < 0.01). No correlations were found between wave V latency, wave V-III interval, waveform score, and MS-word scores. A negative eABR always predicted a negative outcome. Among the patients with negative outcomes, 75% had eABRs.

Conclusions: Implant electrical auditory brainstem recordings can be used (eABRs wave V) to predict a negative functional outcome. Low-frequency wave V was observed in all patients with successful CI outcomes. Patients for whom eABR waveforms were completely absent had unsuccessful CI outcomes.

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Important clinical research in otology (N615)

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Cochlear implantation in the elderly

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Learning Objectives: To analyse complications and outcome of cochlear implant (CI) treatment in seniors receiving CIs during a 10-year period.

Introduction: The elderly population in Sweden is growing, particularly in those over 80 years of age (Statistics Sweden Demographic reports, 2009). This has led to an increasing incidence of age-related hearing loss and it is expected that this group will represent an important cohort to treat with cochlear implants (CIs).

Methods: A total of 28 patients, 79 years or older (mean age 81.6 years), were evaluated and compared with a younger group of 76 patients, 20–60 years old (mean age 48.9 years). A retrospective study of the patients’ records was performed. Data on per- and post-operative complications, pre- and post-operative speech perception, estimated cognitive skills, and social situation was extracted. A subjective score was assessed and correlated with post-operative performance.

Results: No severe per- or post-operative surgical complications were noted. Speech perception improved significantly after surgery (P < 0.001). The younger age group showed better results post-operatively for monosyllabic words (P < 0.01) compared with the older group with no difference seen for bi-syllabic words. In both the groups, there were no significant differences between patients living with or without social support.

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**Conclusion**: CI surgery for patients 79 years or older was well tolerated. Patients benefited greatly from the device with improved hearing. CI should not be denied older individuals who are otherwise in good health. Non-use in the elderly was associated with post-operative vertigo and tinnitus, severe disease and limited social support.

**Material and Methods**: The sampled cochleae originated from unidentified autopsy materials and collection of inner ear mould created in Uppsala during the 70th. No information from unidentified autopsy materials and collection of inner ear moulds. Reference points were constructed from photographic reproductions taken at different angles. Hearing preservation technique was performed in 21 patients and the dimensions of the cochlea were studied pre- and postoperatively.

**Results**: The length of the first turn represented approximately 53% of the total cochlear length. The width of various turns differed greatly between individuals and the height varied by as much as 1.4 mm, representing one third of the total height. The electrode configurations in each of the 21 cases were shown in insets and its relation to the round window. Hearing was conserved in all patients after one year.

**Conclusions**: The human cochlea displays wide and individual anatomic variation. These variations can influence the trajectory chosen by the surgeon and also the possibilities to preserve microstructures and residual hearing. Some variations may even explain difficulties experienced by surgeons to reach full insertion, even in normal cochleae.

**Important clinical research in otology (N615)**

**ID: 615.3**

**Human Cochlear Morphology and how it relates to Cochlear Implantation**

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**Learning Objectives**: The ability to preoperatively estimate the insertion depth in a particular patient may influence the results in hearing preservation CI surgery.

**Introduction**: Modern cochlear implant (CI) surgery also purposes to preserve and maintain residual hearing and intra-cochlear structures. The rich variations in design and dimensions of the human cochlea may influence surgical trajectories and functional outcome. Here, we present anatomical data and experiences from hearing preservation CI-surgery.

**Material and Methods**: The length of the first turn represented approximately 53% of the total cochlear length. The width of various turns differed greatly between individuals and the height varied by as much as 1.4 mm, representing one third of the total height. The electrode configurations in each of the 21 cases were shown in insets and its relation to the round window. Hearing was conserved in all patients after one year.

**Results**: More than 1300 cases have been included but still the findings are mainly descriptive. The typical patient with acute mastoiditis has been well defined, an otherwise healthy toddler without previous ear problems.

**Conclusions**: Some patients are difficult to fit into a pre-formed definition which might lead to an unfortunate exclusion of “odd cases” that should be part of the diversified group of patients suffering from complications of AOM.

**Epidemiology aspects of CSOM (R616)**

**ID: 616.1**

**Health check up system for hearing and congenital cholesteatoma**

**Presenting Author**: Taeko Okuno

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**Learning Objectives**: Descriptive studies are needed to define good comparative studies on the most important issues in a clinical disorder. The findings in this large pilot study can direct future prospective studies on how to treat acute mastoiditis in an era with efficient antibiotics and in a possible post-antibiotic era.

**Introduction**: Since the year 2007, the largest study on acute mastoiditis, so far, has been performed in Sweden. The main reason for performing it was to evaluate how reduced antibiotic treatment of acute otitis media affected its most common complication.

**Methods**: Most of the published results in the study “Mastoiditis in Sweden” were based on interpretation of medical records. This poses special challenges regarding definition and interpretation of the results and if antibiotic resistance has affected the results.

**Results**: More than 1300 cases have been included but still the findings are mainly descriptive. The typical patient with acute mastoiditis has been well defined, an otherwise healthy toddler without previous ear problems.

**Conclusions**: Some patients are difficult to fit into a pre-formed definition which might lead to an unfortunate exclusion of “odd cases” that should be part of the diversified group of patients suffering from complications of AOM.