THE BELFAST EXPERIENCE WITH THE MULTI-STRAteGY CLARION® COCHLEAR IMPLANT SYSTEM

Mr Joseph Toner
Cochlear Implant Centre, Belfast City Hospital, Belfast, Northern Ireland

The CLARION® cochlear implant system has been in use in Belfast since October 1995. The digital signal processor is capable of implementing a wide variety of speech processing strategies. The two currently available are the Compressed Analogue (CA) and the Continuous Interleaved Sampling (CIS).

This paper will report on the clinical experience of the first six CLARION® users in the Belfast Cochlear Implant Centre. The surgical experience will be reported including the experience of a patient who underwent implant surgery under local anaesthetic. The implications of extending cochlear implant surgery to those patients previously considered unfit for general anaesthesia will be discussed. In this small series half of the patients are currently using CA while the others use CIS. Speech discrimination performance and choice of processing strategy will be discussed for the six months following device fitting. Subjective and objective performance measures will be reported. The ability to choose between speech processing strategies will be highlighted.

AETIOLOGY OF HEARING LOSS IN CHILDREN PRESENTING FOR COCHLEAR IMPLANTATION AND OUTCOMES

P.G. O'Sullivan, S.M. Ellul, B.C. Pyman, G.M. Clark
The Royal Victorian Eye & Ear Hospital, The Department of Otologyngology, The University of Melbourne, Melbourne, Australia

The aetiology of hearing loss has a significant bearing on the likely outcome of cochlear implantation and therefore is an important consideration in patient selection and workup. Disease processes which result in sensorineural hearing loss may be associated with other structural or functional neurological disorders, in addition to damage to the cochlea and auditory pathways.

The classification of aetiology of sensorineural hearing loss varies widely between different authors and is compounded by the difficulty in determining the aetiology of sensorineural deafness retrospectively when hearing loss in infants is eventually detected. Together these factors have made it difficult to establish a relationship between the aetiology of the hearing loss and the benefit following cochlear implantation.

In an effort to further evaluate potential patient response to implantation and to anticipate likely length of rehabilitation, we have classified the aetiology of hearing loss according to a prepared format which is genetic in origin and those that are non-genetic in origin. Each of these divisions is further subdivided into those factors which are genetic in origin and those that are not genetic in origin. Aetiology of hearing loss is then correlated with the best level of speech perception attained and the length of time taken to reach that level.

Our results are presented and discussed in the context of identifying those patients who might conceivably do less well from cochlear implantation than others and who would benefit from earlier intervention (eg: teaching of signing) to avoid delay in communication skills.

COCHLEAR IMPLANTATION IN THE PRESENCE OF CSOM

Professor R.T. Ramden
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Cochlear implantation has been shown to be a reliable method of rehabilitation for certain profoundly deaf or deafened individuals. Most patients assessed cochlear implantation have middle ears which are free of pathology, and in the patients cochlear implantation is usually an uncomplicated single staged operation. Chronic suppurative otitis media (CSOM) may be encountered however, either as the cause of the profound deafness or as a non contributory chance finding. Such patients present the surgeon with a potential problem.

Nine patients are presented who underwent cochlear implantation in the presence of chronic suppurative otitis media. Four had a simple tympanic membrane perforation, four had a pre-existing mastoid cavity and one had cholesteatoma in the ear chosen for implantation.

Patients with a simple perforation had a staged procedure with myringoplasty followed by cochlear implantation after an interval of 3 months. Patients with cholesteatoma or with an unstable mastoid cavity were also staged. A mastoidectomy or revision mastoidecote was performed with obliteration of the middle ear and mastoids using a superiorly pedicled temporals muscle flap and blind sac closure of the external ear. After a further six months a second stage procedure was performed to confirm that the middle ear cleft was healthy and to insert the implant. Patients presenting with a stable mastoid cavity underwent obliteration of the cavity and implantation of the electrode as a one staged procedure. To date there have been no serious problems such as graft breakdown, recurrence of disease or implant extrusion. BKB, VCV and ENV results are confirmed that all patients are performing well.

1 YEAR RESULTS FROM THE CLINICAL TRIAL OF THE NUCLEUS 21 CHANNEL AUDITORY BRAINSTEM IMPLANT

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The Auditory Brainstem Implant (ABI) is indicated for bilateral retrocochlear lesions affecting VIIIth nerve function. This may occur as a result of skull fractures or tumour growths on the VIIIth nerve (eg, neurofibromatosis type 2). The Auditory Brainstem Implant, which comprises a tiny array of 21 stimulating electrode pads, is placed within the lateral recess of the 4th ventricle with its electrodes in contact with the surface of the cochlear nucleus. By stimulating different combinations of electrodes it is possible to elicit a variety of pitch-discrete, auditory sensations allowing the utilisation of a multichannel speech processing strategy.

In co-operation with Cochlear Ltd a number of different ABI designs were investigated based upon the Nucleus® Cochlear Implant System. Following some encouraging results from 10 patients implanted in a pilot study between 1992-95 a clinical trial was initiated in February 1996. In line with pilot study findings, interim clinical trial results from 10 further patients have demonstrated that the ABI can provide sufficient auditory information to assist the
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In an effort to further evaluate potential patient response to implantation and to anticipate likely length of habilitation, we have classified the aetiology of hearing loss according to a prepared format. Ninety eight children who received a multi-channel cochlear implant between the ages of seventeen months and sixteen years are reviewed and divided into those patients where aetiology of hearing loss is known (69%) and those where aetiology of hearing loss is unknown (31%).

Where aetiology is known these factors are then divided into those that are congenital in origin and those that are non-congenital in origin. Each of these divisions is further subdivided into those factors which are genetic in origin and those that are not genetic in origin. Aetiology of hearing loss is then correlated with the best level of speech perception attained and the length of time taken to reach that level.

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