Introduction

Electrical stimulation of the ear was attempted as early as the eighteenth century. The modern era of cochlear implantation began with Djourno and Eyries who inserted a device that produced awareness of sound, but no speech discrimination. Animal models were developed in the 1960s. Prototype implants were introduced in the early 1970s and rapid development took place over the next decade **(Toner, 2008).**

In 1969, William House recommended clinical use of electrical stimulation in profoundly deaf patient. Several patients were implanted and outcomes evaluated in details. In the 1980s, commercially available devices were used in routine clinical practice. The Food and Drug Administration (FDA) approved their use in adults in 1984. Increased confidence in results obtained in adults led to more widespread pediatric implantation in the late 1980s. In 1990, the FDA approved the use of cochlear implantation in children **(Toner, 2008).**

Cochlear implants are the first true bionic sense organs. The human cochlea is an electromechanical transducer. Cochlear implants, like other human hair cell, receive mechanical sound energy and convert it into a series of electrical impulses **(Roland, 2003).**

Sound is first detected by a microphone (usually worn on the ear) and converted into an analog electrical signal. This signal is then sent to an external processor where it is transformed into an electronic code. This code is transmitted via radiofrequency through the skin by a transmitting coil. Ultimately, this code is translated by the receiver-stimulator into rapid electric impulses distributed to electrodes on a coil implanted within the cochlea **(Gluth, et al. 2008).**

As outlined in the 1995 USA National Institutes of Health (NIH) consensus statement on cochlear implantation, adult candidacy is noted as being successful in postlingually deaf adults with severe-to-profound hearing loss with no speech perception benefit from hearing aids **(National Institutes of Health, 1995).**

Prelingually deafened adults should be counseled in regard to realistic expectations, as language and open-set speech discrimination outcomes are less predictable. Children are considered candidates for implantation at age 12 months, and, because of meningitis-related deafness with progressive cochlear ossification, occasional earlier implantation is necessary **(Megerian and Murray, 2010).**

Investigations are on going into extending the age of early implantation to younger than 12 months. Audiologic criteria include severe-to-profound sensori-neural hearing loss bilaterally and poor speech perception under best-aided conditions with a failure to progress with hearing aids and an educational environment that stresses oral communication **(Megerian and Murray, 2010).**

Binaural cochlear implants can assist in the localization of sounds and have the potential in some individuals to improve speech understanding in quiet and in noise **(Gantz, et al. 2002).**

The team concept in cochlear implant evaluation allows for an exchange of information between the surgeon and other members of the implant and habilitation/rehabilitation process, including audiologists, speech and language therapists, social workers and psychologists **(Megerian and Murray, 2010).**

Work-up for a patient seeking cochlear implantation includes: audiologic examination, Computerized Tomography (CT) scan and Magnetic Resonance Imaging (MRI) of temporal bones, trial of high-powered hearing aids, psychological evaluation and medical evaluation **(Porter and Gadre, 2003).**

Unless intensive postoperative habilitation/rehabilitation is undertaken, cochlear implantation is likely to provide little benefit. Each patient's need for rehabilitation is different based on pre-operative auditory experience **(Porter and Gadre, 2003).**

The surgery involves: cortical mastoidectomy, posterior tympanotomy and insertion of the array of the electrodes through the basal coil of the cochlea. General anesthesia is needed for children and is usual for adult. The body of the implant is inserted into a seat drilled in the skull behind the ear. There are other surgical techniques have been developed **(Marshall and Gibbin, 2008).**

Skin incisions must be designed to provide an access to the mastoid process and to provide coverage of the internal portion of the implant package while preserving the blood supply of the post-auricular skin **(Miyamoto, 1995).**

Minimal access surgery for cochlear implantation has been developed recently in order to decrease surgical trauma and secondary complications, mostly related to size and shape of the skin flap **(O'Donoghue and Nikolopoulos, 2002).**

Although cochlear implantation is considered a safe method of habilitation/rehabilitation for profoundly deaf individuals, a number of these patients suffer complications after surgery **(Postelmans, et al. 2007).**

The complications of cochlear implant surgery are a reflection of the complexity of the surgical procedure, the skills of the operating surgeon and the risks inherent in insertion of a large foreign body immediately deep to the scalp **(Cohen and Hoffman, 1993).**

Wound and flap problems have been the commonest complications experienced in many series. Intracranial complication rates associated with cochlear implantation are low, although potentially very serious **(Dodson, et al. 2007).**