

Review of Cochlear Implantation at KPJ Tawakkal Specialist Hospital

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Abstract

Over the years, cochlear implantation has become a well-accepted standard procedure in managing severe to profound sensorineural hearing loss. Patients who have received cochlear implant followed by intensive audiological and speech rehabilitation are able to acquire or regain hearing and develop normal or near normal speech. In Malaysia, there are a total of 503 recipients of cochlear implantation. Most of which were done in public hospitals. At KPJ, cochlear implantation started in Tawakkal Specialist Hospital in November 2012. Since then, we have had 6 cochlear implant recipients (a total of 8 ears). We review all cochlear implantation cases that were done in KPJ Tawakkal Hospital. We collected all data of patients who underwent cochlear implantation from period of November 2012 till July 2014. Amongst them, there were 3 males and 3 females. Three patients were implanted in the right ear only and 1 patient had left ear implantation only. Two of them received bilateral implants. Their age ranges from 2-35 years old. Three of them were Malaysians. The other 3 were foreigners; 2 from Brunei and 1 from Indonesia. There was no surgical complication. Cochlear implant recipient requires audiology and speech rehabilitation. In KPJ Tawakkal Specialist Hospital, these services are provided by the locum speech therapist and audiologists. KPJ Tawakkal Specialist Hospital is one of the very few private hospitals that offer cochlear implantation. It has the potential to become the centre of excellence for cochlear implantation in private hospitals. This program can be improved if we have permanent audiologists and speech therapists. These facilities are not only beneficial for cochlear implantation programme but also for newborn hearing screening and other diagnostic services.

Keywords: Cochlear implantation; Sensorineural hearing loss; Audiological; Speech rehabilitation

Introduction

Hearing impairment is the most frequent sensory deficit in human populations, affecting more than 250 million people in the world. Consequences of hearing impairment include inability to interpret speech sounds, delay in language acquisition and reduced ability to communicate. It also leads to educational disadvantage, social isolation and stigmatization [1]. Hearing aids can be used effectively for patients with moderate to severe hearing loss. However for individuals with severe to profound sensorineural hearing loss, the only clinically available treatment is cochlear implant [2]. Cochlear implant operations have been done to over 150,000 people in both children and adults worldwide [3]. The first Cochlear Implant surgery in Malaysia was done in Pusat Perubatan University Kebangsaan Malaysia in December 1995. So far, there are a total of 510 recipients of cochlear implantation in Malaysia from the year 1995-2013. Most of the cases were done in public hospitals with very few private hospitals in Malaysia that offer cochlear implantation programme. At KPJ Healthcare group of hospitals, cochlear implantation was started in KPJ Tawakkal Specialist Hospital in October 2012. In this article we review the demographic pattern of cochlear implant recipients in KPJ Tawakkal Specialist Hospital, the complications and outcomes of cochlear implantation surgery.

Methodology

We collected all data of patients who underwent cochlear implantation in KPJ Tawakkal Specialist Hospital from November 2012 till July 2014. From the data, we have gathered the total numbers of patients and their demographic details such as sex, age at time of operation and their nationality. We have determined the cause of hearing loss, which rendered them the candidates for cochlear implant. We also collected data of the side of operation; unilateral or bilateral, complication of surgery and postoperative outcomes.

Results

There were total of 6 recipients (8 ears). Amongst them, there were 3 males and 3 females. There were 3 children and 3 adults. The youngest is 2 years old while the oldest patient is 35 years old. Three patients were implanted in the right ear only and 1 patient had left ear implantation only. Two of them received for bilateral ears. Three of them were Malaysians. The other 3 were foreigners; 2 from Brunei and 1 from Indonesia.

Patient No.	Side of Operation	Age of patient at time of surgery	Nationality	Cause of hearing loss
1	Bilateral	5	Brunei	Congenital severe to profound sensorineural hearing loss

2	Right	13	Malaysia	Moderate congenital sensorineural which progressed to severe hearing loss
3	Right	35	Malaysia	Early onset presbycusis
4	Bilateral	2	Brunei	Congenital severe to profound sensorineural hearing loss
5	Right	4	Malaysia	Congenital severe to profound sensorineural hearing loss
6	Left	23	Indonesia	Moderate congenital sensorineural which progressed to severe hearing loss

Table 1: Showing side of operation, age of patient at time of surgery, nationality and cause of hearing loss.

Causes of hearing loss in these patients are divided into congenital and acquired. Five out of six patients had congenital hearing loss. Three of the five patients with congenital hearing loss presented with severe to profound sensorineural hearing loss. The other two patients had moderate sensorineural hearing loss since childhood and were on hearing aid but later it progressed to severe hearing loss. One of them had early onset presbycusis.

Intraoperatively, all of these patients received Cochlear Nucleus with Contour Advance Electrode from Cochlear Limited. Full insertions of the electrodes were achieved in all patients. Neural Response Telemetry (NRT) was tested during the surgery and the cochlear implant was confirmed effectively stimulating the hearing nerve fibers in the inner ear.

There was no surgical complication in these patients. None of them developed facial nerve palsy or perilymph leak. They were discharged 2 days after the operation. There was no prolonged hospital stay. Postoperatively, patients were seen 3-4 weeks after surgery for the first “switch on” of the cochlear implant. This process took about 2-3 sessions before the mapping is stable. The 3 patients who were from overseas were required to come back for these sessions. Next, these cochlear implant users were followed up with intensive speech therapy. This is done either in KPJ Tawakkal Specialist Hospital or in their home countries.

The outcomes of cochlear implant in our initial 6 patients were very encouraging. Amongst the 3 children who received cochlear implants, all were able to recognized speech after 6 months. They were able to communicate verbally with at least 2-3 words sentences. For the adult recipients, they were able to have normal or near- normal open speech after 6 months.

Discussion

Children and adults who have severe to profound sensorineural hearing loss are the candidates for cochlear implants. As of December 2010, about 219,000 people worldwide have received cochlear implants [4]. In Malaysia, there are a total of 503 cases of cochlear implantation. Most of these cases were done in public hospitals. KPJ Tawakkal Specialist Hospital is one of the very few private centres that offer cochlear implantation programme. The first cochlear implantation in KPJ Tawakkal Hospital was started in October 2012. Since then, we

have had 6 recipients (a total of 8 ears) of cochlear implantation. Although the number is small, we have shown good results. All of the recipients did not have any intraoperative complications such as facial nerve injury or perilymph leak. The average post-operative hospital stays for all patients were 2 days. The outcomes of cochlear implant in our initial 6 patients were very encouraging. After vigorous mapping and speech therapy sessions they were able to develop normal or near normal verbal communications. The 3 children who received cochlear implant were able to recognize speech after 6 months. All of them were able to communicate verbally with at least 2-3 words sentences. As for the 3 adults who received cochlear implants, they were able to achieve normal or near- normal open speech after 6 months.

Rehabilitation for children and adults post cochlear implantation is an accepted critical part in determining the outcome of cochlea implantation. Cochlear implant recipients require both audiology and speech therapy as part of the rehabilitation. They are taught how to use the implant and how to respond to the sounds they are receiving. About 3-4 weeks after surgery, the recipient returned to the hospital to be fit with the external parts-the microphone and speech processor-and to “switch on” and program (called mapping) the implant. Additional visits are needed for activating, adjusting, and programming the various electrodes that have been implanted.

In KPJ Tawakkal Specialist Hospital, locum audiologists and speech therapists provide both of the mapping and speech therapy services. It is ideal to have permanent speech therapist and audiologist in our centre to rehabilitate cochlear implant recipients.

Among 6 of our cochlear implant recipients, 3 were foreigners from regional neighbours. Two were from Brunei and 1 from Indonesia. All of the recipients regardless of their home countries came to KPJ Tawakkal Specialist Hospital for the mapping sessions. Overseas patients were required come back for the mapping sessions which were done monthly until mapping was stable. On the other hand, speech therapy is a more intensive rehabilitation. It requires longer follow up and weekly sessions. All of the overseas patients underwent the speech therapy sessions in their home countries. Therefore before decision for surgery is made for the overseas candidates, it is important for the surgeon to make sure these patients have speech therapy services at their countries to do the necessary rehabilitation for them [5].

Conclusion

KPJ Tawakkal Specialist Hospital is one of the few private hospitals in Malaysia that offers cochlear implantation. It has the potential to become a regional leader for cochlear implant. This program can be improved if we have permanent audiologists and speech therapists working as a team in a dedicated centre of excellence. These services will not only be beneficial for cochlear implantation programme but also provide the measures for newborn hearing screening and other audiology and speech services.

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