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.

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.

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 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.

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Side of Operation</th>
<th>Age of patient at time of surgery</th>
<th>Nationality</th>
<th>Cause of hearing loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bilateral</td>
<td>5</td>
<td>Brunei</td>
<td>Congenital severe to profound sensorineural hearing loss</td>
</tr>
</tbody>
</table>
KPJ Tawakkal Hospital was started in October 2012. Since then, we all were able to recognize speech and develop 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 cochlear 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.

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

<table>
<thead>
<tr>
<th></th>
<th>Side</th>
<th>Age</th>
<th>Nationality</th>
<th>Cause of hearing loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Right</td>
<td>13</td>
<td>Malaysia</td>
<td>Moderate congenital sensorineural which progressed to severe hearing loss</td>
</tr>
<tr>
<td>3</td>
<td>Right</td>
<td>35</td>
<td>Malaysia</td>
<td>Early onset presbycusis</td>
</tr>
<tr>
<td>4</td>
<td>Bilateral</td>
<td>2</td>
<td>Brunei</td>
<td>Congenital severe to profound sensorineural hearing loss</td>
</tr>
<tr>
<td>5</td>
<td>Right</td>
<td>4</td>
<td>Malaysia</td>
<td>Congenital severe to profound sensorineural hearing loss</td>
</tr>
<tr>
<td>6</td>
<td>Left</td>
<td>23</td>
<td>Indonesia</td>
<td>Moderate congenital sensorineural which progressed to severe hearing loss</td>
</tr>
</tbody>
</table>

References

4. NIDCD Fact Sheet: Cochlear Implants NIH Publication No. 11-4798.