

Original Research

Evaluation of patients undergoing BAHA implant with hearing loss

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ABSTRACT:

Background: Hearing loss refers to a partial or total inability to hear sounds. It can occur suddenly or gradually over time and may affect one or both ears. The present study was conducted to evaluate patients undergoing BAHA implant with hearing loss. **Materials & Methods:** 70 patients with hearing loss of both genders were selected for the study. The audiological assessment was assessed using hearing aid gain threshold. Parameters such as side, hearing loss and indication for BAHA was recorded. Glasgow Benefit Inventory (GBI) questionnaires was used as part of the assessment tool. **Results:** Out of 70 patients, males were 44 and females were 26. The side involved was right in 26, left in 24 and both in 20 cases. Indication of BAHA was unilateral microtia in 24, congenital canal atresia in 28 and bilateral chronic discharging ear in 18 cases. Hearing loss was mild in 21, moderate in 39 and severe in 10 patients. The difference was significant ($P < 0.05$). The mean for general subscale was 46.1, social subscale was 58.2, and for physical health subscale was 41.8. **Conclusion:** BAHA has proved significant benefit in from audiological improvement in patients with hearing loss.

Keywords: audiological, bone-anchored hearing aid, Hearing

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INTRODUCTION

Hearing loss refers to a partial or total inability to hear sounds. It can occur suddenly or gradually over time and may affect one or both ears. Hearing loss can have various causes and can be temporary or permanent.¹ Conductive hearing loss occurs when sound waves cannot pass through the outer or middle ear to reach the inner ear.² Common causes include ear infections, earwax buildup, fluid in the middle ear, perforation of the eardrum, or abnormalities of the middle ear bones. Sensorineural hearing loss occurs due to damage to the inner ear (cochlea) or the auditory nerve pathways.³ It is often caused by aging (presbycusis), exposure to loud noise (noise-induced hearing loss), certain medications, genetic factors, head trauma, or diseases such as Meniere's disease. Mixed hearing loss involves a combination of conductive and sensorineural hearing loss, where there is damage or impairment in both the outer/middle ear and the inner ear or auditory nerve.⁴

A bone-anchored hearing aid (BAHA) is a type of hearing device that is surgically implanted to improve hearing in individuals with certain types of hearing loss. Unlike traditional hearing aids that amplify sound through the ear canal, BAHA works by transmitting sound vibrations directly to the inner ear through bone conduction.⁵ The BAHA system consists of three main components: a small titanium implant, an abutment (a metal post), and an external sound processor.⁶ During a surgical procedure, the titanium implant is surgically placed into the bone behind the ear (typically the skull bone, known as the mastoid bone). Over time, the implant integrates with the bone through a process called osseointegration, providing a stable foundation for the abutment.^{7,8} The present study was conducted to evaluate patients undergoing BAHA implant with hearing loss.

MATERIALS & METHODS

The present study was conducted on 70 patients with hearing loss of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. The audiological assessment was assessed using hearing

aid gain threshold. Parameters such as side, hearing loss and indication for BAHA was recorded. Glasgow Benefit Inventory (GBI) questionnaire was used as part of the assessment tool. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 70		
Gender	Males	Females
Number	44	26

Table I shows that out of 70 patients, males were 44 and females were 26.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Side	Right	26	0.91
	Left	24	
	Both	20	
indication	unilateral microtia	24	0.75
	congenital canal atresia	28	
	bilateral chronic discharging ear	18	
Hearing loss	Mild	21	0.05
	Moderate	39	
	Severe	10	

Table II, graph I shows that side involved was right in 26, left in 24 and both in 20 cases. Indication of BAHA was unilateral microtia in 24, congenital canal atresia in 28 and bilateral chronic discharging ear in 18 cases. Hearing loss was mild in 21, moderate in 39 and severe in 10 patients. The difference was significant (P< 0.05).

Graph I Assessment of parameters

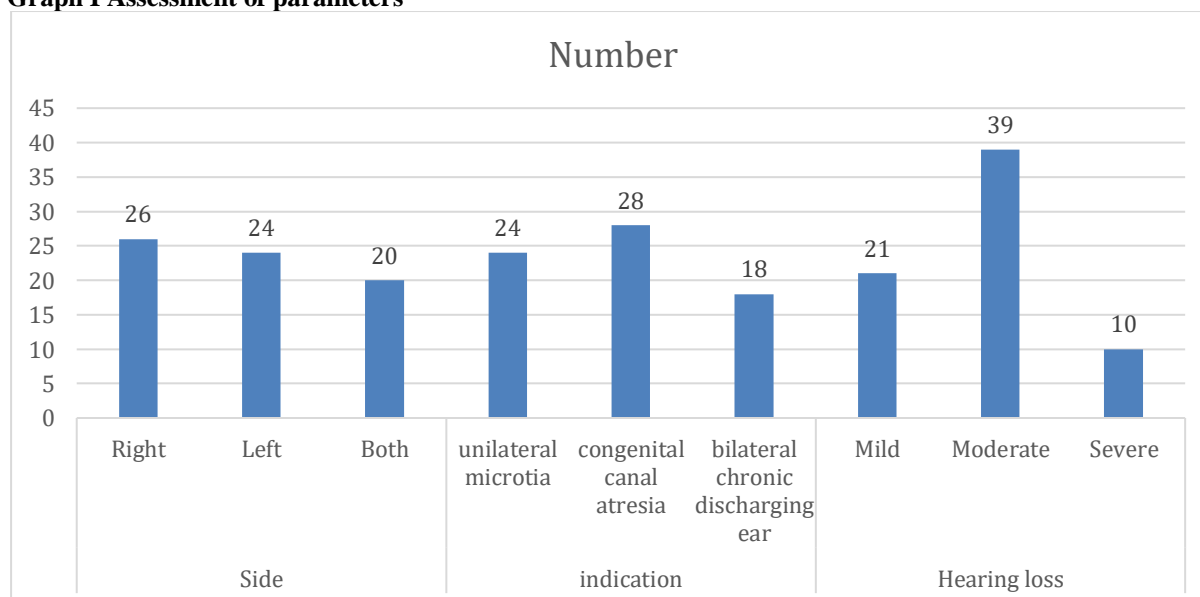


Table III Assessment of Glasgow Benefit Inventory (GBI) questionnaire

GBI	Mean	SD
general subscale	46.1	6.1
social subscale	58.2	11.7
Physical health subscale	41.8	9.6

Table III shows that mean for general subscale was 46.1, social subscale was 58.2, and for physical health subscale was 41.8.

DISCUSSION

BAHA is primarily used to treat individuals with conductive hearing loss, mixed hearing loss, or single-sided deafness (unilateral hearing loss).^{9,10} It may be recommended for individuals who cannot benefit from traditional hearing aids due to conditions such as chronic ear infections or abnormalities of the outer or middle ear, malformation or absence of the ear canal or middle ear structures, and unilateral hearing loss, where one ear has normal hearing and the other has significant hearing loss or deafness.^{11,12} The present study was conducted to evaluate patients undergoing BAHA implant with hearing loss.

We found that out of 70 patients, males were 44 and females were 26. Rahim et al¹³ studied thirty patients those underwent Baha implants. Patients' ages ranged from 5 to 38 years old, with 13 being the median age. Thirteen patients (37.1%) were female, whereas 22 patients (62.8%) were male. With the exception of one adult patient who had bilateral chronic ear discharge and chronic discomfort from ear mold, almost all cases involved canal atresia. Of the patients, 14 patients (40%) have mild to moderate hearing loss (20–39 dB), and the majority of 21 patients (60%) have moderate to severe hearing loss (40–89 dB). A post-operative hearing test was conducted. Every patient has seen an improvement in their assisted hearing with the range of 10–25 dBL. Every subscale yielded a positive result for the GBI. The majority of patients (91.4%) felt that BAHA is satisfactory cosmetically, and 88.6% reported using it for more than four hours a day. Although all patients had some degree of skin irritation (Holger grade 1-2), only 20% of them needed surgery. All of our patients' assisted hearing has improved by a range of 10 to 25 dB.

We observed that side involved was right in 26, left in 24 and both in 20 cases. Indication of BAHA was unilateral microtia in 24, congenital canal atresia in 28 and bilateral chronic discharging ear in 18 cases. Hearing loss was mild in 21, moderate in 39 and severe in 10 patients. We observed that mean for general subscale was 46.1, social subscale was 58.2, and for physical health subscale was 41.8. Asma et al¹⁴ found thirty-three patients with hearing problems. Their age at implantation ranged from 5 to 40 years. Of 33 patients, 29 (87.9 %) patients had bilateral microtia and canal atresia, 3 (9.1 %) patients had unilateral microtia and canal atresia and 1 (3.0 %) patients have SSD following labyrinthitis. One patient (3.2 %) had major complication which is lost of implant due to failure of osseointegration. Soft tissue reactions were seen 7 patients (21.1 %). Of these 7 patients, 4 patients required 3–4 procedures as day care operation for excision of the skin overgrowth surrounding the abutment. Recurrent antibiotic treatment was required in 3 patients (9.7 %). None of our patient had history of intraoperative or peri-operative complication following Baha surgery. The commonest complications are local infection and

inflammation at the implant site. None of our patient had history of intraoperative or peri-operative complication following Baha implant surgery.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that BAHA has proved significant benefit in from audiological improvement in patients with hearing loss.

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