Osseointegrated cochlear stimulators, commonly referred to as the BAHA Hearing System, are effective in restoring hearing for many individuals. The BAHA System (Figure 1) consists of a titanium screw which is implanted in the bone behind the ear. Titanium is used as bone grows into titanium – a process known as osseointegration. Osseointegration takes approximately 3 months to occur. Attached to the screw is an abutment onto which the BAHA System speech processor can be mounted. The speech processor is an electronic device that converts sound energy to vibratory energy which is then transmitted to the patient’s skull via the osseointegrated screw. These vibrations directly stimulate the cochlea and allow speech reception.

Implantation consists of outpatient surgery in which a small area (approximately 2 x 3 cm) of skin behind the ear is thinned and the underlying adipose tissue is removed. The bone is exposed and two screws are implanted using a dental drill – the second screw (“sleeper screw”) is used if the primary screw fails for any reason. The thinned skin is placed over the exposed bone and a dressing is applied. Good nursing care of the site is crucial in post-operative healing and in patient education for long term care. Long term the site is easily maintained using a soft-bristle tooth brush to clean debris from around the abutment.

Complications were infrequent. One patient had failure of osseointegration of the primary screw necessitating intra-office placement of the abutment onto the “sleeper” screw. One patient had exuberant wound healing necessitating debridement of skin near the abutment. Only one patient did not use their BAHA regularly. This individual has a nicely healed, mature abutment and functioning external device. The reason for the non-use is unclear.

More frequently, patients attest to the way the device has changed their lives. Letters received indicate that “the instant the device was attached, I could hear like a normal person” and this has “renewed hearing.” Concerns about cosmesis are often alleviated as “it is completely hidden under my hair.” Patients consider it a modern “miracle” as it facilitates getting back “part of their life which was lost.”

More recently, the BAHA System has been FDA approved for unilateral deafness (Figure 2). For such patients, it permits sound localization. Comparisons have shown it to be at least as effective as contra lateral routing of signal (CROS) aids and more tolerated by users. It has been successfully used to rehabilitate unilateral hearing loss due to acoustic neuroma surgery.

Osseointegrated cochlear stimulators were initially FDA-approved for patients with fixed conductive hearing loss, such as individuals born with aural atresia or those who have undergone canal wall down mastoidectomies. Compared to traditional bone hearing aids which can cause discomfort from the compressive head band, the BAHA System is as effective in hearing rehabilitation while providing minimal discomfort. Its compact design is easily camouflaged in the hair behind the ear. It can be used by individuals with deformed external ears. As it is not placed in the external canal, it reduces the incidence of recurrent otitis externa. It is easily detachable for showering, swimming, contact sports and sleeping.

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CONCLUSIONS

Osseointegrated cochlear stimulators, a.k.a. BAHA Hearing Systems, are a tremendous addition to our hearing rehabilitation armamentarium. They can be used in multiple situations, most notably for patients with fixed conductive hearing loss and those with unilateral sensorineural hearing loss. Post-operative fitting is a rewarding experience as patients quickly and effectively regain near-normal hearing.

INTRODUCTION

Osseointegrated cochlear stimulators, commonly referred to as the BAHA Hearing Systems, are effective in restoring hearing for many individuals. The BAHA System (Figure 1) consists of a titanium screw which is implanted in the bone behind the ear. Titanium is used as bone grows into titanium – a process known as osseointegration. Osseointegration takes approximately 3 months to occur. Attached to the screw is an abutment onto which the BAHA System speech processor can be mounted. The speech processor is an electronic device that converts sound energy to vibratory energy which is then transmitted to the patient’s skull via the osseointegrated screw. These vibrations directly stimulate the cochlea and allow speech reception.

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MATERIALS AND METHODS

Institutional Review Board approval was obtained. A retrospective chart review was undertaken of all BAHA System surgeries performed at VUMC from May of 2002 until the present.

RESULTS

Thirty (n=30) osseointegrated cochlear implants were performed on 28 patients over the past 2 years. Two patients, one simultaneously and one sequentially, received bilateral BAHAs. Twenty-four BAHAs (80%) were performed for fixed conductive hearing loss and six (20%) for unilateral sensorineural hearing loss.

CONCLUSIONS

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