BAHA SI STEMOT I NEGOVATA PRI MENA

Slavcho CHADIEV
ENT - department of Audiology, Medical Center - Veles

Abstract
People with impaired hearing wear hearing aids to compensate that failure. There is one category of persons with impaired hearing that are not able to use behind-the ear hearing aids (chronical ear infections, cholesteatoma). People with that kind of damage use behind-the ear hearing aids -prosthesis that are implanted by surgery in the mastoid bone, where the sound is transmitted to the cochlea. That is the BAHA sound processor, product of ENTIFIK Medical system.

How does BAHA System work
Prof. Brenemark during his research, found a way of using pure titanium as an anchoring unit and support for variety of prosthetic reconstructions including what was then a new type of hearing device. The fixture is incorporated within bone. This he described as direct structural and functional connection between living bone and the surface of a load carrying implant. The BAHA System is an osseointegrated implant that offers an alternative method of conducting sound via the skull bone. Its function is not to magnify or reproduce sound, but rather, to help the natural sound one hears travel efficiently to functioning cochlea.

Corresponding Address:
Slavcho CHADIEV
ENT - department of Audiology, Medical Center - Veles
Shefki Sali 2, 1400 Veles, Republic of Macedonia
E-mail: scadiev@yahoo.com
It is the only implantet treatment that work through direct bone conduction. The BAHA System is a unique and predictable solution for conductive and mixed loss hearing impairment.

**How can use BAHA SYSTEM**

BAHA system is usued to aid people with chronic ear infections where hearing continued to deteriorate, post cholesteatoma surgery, trauma, otosclerosis, congenital hearing loss, Treacher Collins Syndrom or other acquired malformation of the middle or external ear resulting in a missing or incomplete, complete ear canal (atresia) and SSD - single sided deafness. The BAHA System combines a sound processor with a small titanium fixture implanted behind the ear. The system allows sound to be conducted through the bone rather than via the middle ear - a process known as direct bone conduction. DBC - direct bone conduction process means that vibrations from the sound processor are transmitted via the bone to the cochlea.

The BAHA System is implanted by surgery that lasts 45 - 60 minutes under local anesthesia by putting a small titanium fixture in the mastoide bone behind the ear.
Po operacijata zvučniot procesor se mes-
ti po 10 do 12 nedeli. Pred operativna evolu-
acija na kandidati za BAHA-sistemot vključuva kompletno medicinsko ispituvawe i iscrpna audiometrijska eva-
luacija. BAHA-sistemot se vgraduva od pet godini { na vozраст i postari. Za pacienti pod pet godini { na vozast se preporucuva BAHA@Softband. Ima slučaj koga BAHA-
sistemot e vgraden na dete od samo pet meseci so obostrana kanal na atrezija. Cena-
ta na BAHA-sistemot znesuva 2.200 USA-
dolari { to go pravi sistemot dostapen do ljudeto koi od nego imaat potreba.

Vo SAD od 1996 godini BAHA-sistemot od FDA (Ministerstvoto za lekovi i hranina) e prikazan kako tretman za konduktivno i mešano gubewe na sluhot.

Vo 1999 BAHA-sistemot e odobren od FDA za pedijatinski tretman kaj deca od pet godini i postari.

Vo 2002 godini od FDA e odobren kako tretman za unilateralno senzorineuralno gubewe na sluhot.

Praktikski aspekti

BAHA-zvučniot procesor mo`e da se nosi pri site normalni i aktivnosti, kako i drugi slučni aparati. Toj se vadi koga se spi i, pri kapewelli vodeni sportovi, deka specijal na zashtita i potrebna pri kontaktni sportovi. BAHA-sistemot ed- zajniran kako kompatibilen so celularni telefoni.

Practical aspects

The sound processor is being put 10 to 12 weeks after the surgery. The BAHA System is implanted from the age of 5 and elder. BAHA@Softband is recommended for patient under the age of 5. There is a case when the BAHA System is implanted to a 5 months old baby with a bilateral canal atresia. The price of the BAHA System is 2,200 USA dollars that makes the system available to the people that have a need of it. Preoperative evaluation of the BAHA system candidate includes a complete medical history and a comprehensive audiométric evaluation.

In the USA since 1996 this has been accepted like a treatment for a conductive and mixed hearing loss by the FDA - Food and Drug Administration.

In 1999 BAHA System is approved by the FDA for pediatric use for children of age 5 and older.

In 2002 BAHA System is approved by the FDA for treatment of unilateral sensorineural hearing loss.

The BAHA sound processor can be worn for all normal activities as any other hearing aid. It should be taken off when sleeping, in the shower and water sports, special protection is needed during contact sports.

BAHA system is designed to be compatible with cellular telephones.
When telephones are used, the telephone receiver must be held close to (without touching) the BAHA sound processor. BAHA-system can be used with FM systems and infrared systems.

**Types of BAHA - systems**

1. **BAHA - Classic 300**

**Audiological Indicators:**
The classic 300 is suitable for patients with a pure tone average bone conduction threshold of the indicated ear better than or equal to 45 dB at 0.5; 1; 2 and 4 kHz.

**Battery type 675**
Size 34 x 22 x 10
Weight 14 gr. including battery.
Colours: black, beige, grey, yellow and blue - sound processor, abutment cover, battery, cleaning brush.
2. BAHA - compact

Audiological indicators:

BAHA-kompakt is suitable for patients with a pure tone average bone conduction threshold of the indicated ear better than or equal to 45 dB measured at 0.5; 1; 2 and 4 kHz.

BAHA-kompakt is smaller than the Classic 300 and is designed with output compression to limit distortion and improve sound quality in loud environments.

It is available in the three colours: black, beige and grey.

Battery type: 13

Size: 30x17x10 mm

Weight: 11 g. including battery.
Audiological Indicators:
The Cordelle II is recommended for patients who have average bone threshold of up to approximately 70 dB, measured at 0.5; 1; 2 and 4 kHz.
The transducer is available in three colours: black, beige and gray and the body worn unit is black.

Battery type 9V Body worn unit
Size 90 x 34 x 26
Weight: 88 g. including battery Transducer.
Weight: 20 gr.

Conclusion
BAHA Systems are solution for a lot of people especially children with characteristical hearing impairment that can’t use standard hearing aids.
BAHA System has lower price then Cochlear implant. His use is significant for children from preschool and school age who can’t use standard hearing aids and have problem their voice and language.

LiteraturΑ/References