BAHA SISTEMOT I NEGOVATA PRIMENA

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Rezime

Lu|eto {to imaat o{teten sluh nosat slu{ni pomagala za da go kompenziraat toj nedostig. Ima edna druga kategorija od lica so o{teten sluh koi poradi specifi~nosta na nivnoto o{tetuvawe, ne se vo sostojba da gi koristat zadu{nite slu{ni aparati (hroni~ni infekcii na uvoto, holesteatom). Zatoa, za licata so takvi o{tetuvawa se koristi zadu{no pomagalo-proteza, vgradeno hiru{ki vo mastooidnata koska, kade {to zvukot preku koskata se prenesuva do kohleata. Toa e BAHA-zvu~niot procesor, proizvod na ENTI-FIK Medikal sistem.

Kako rabot i BAHA sistemot

Prof. Brenemark pri negovoto istra`uvawe prona{ol na~in kako da go upotrebi ~istiot titanium kako osnoven del za protetska rekonstrukcija, vklu~uvajki eden nov vid slu{no pomagalo. Fiksaturata e vgradena vo koskata. Ova e opi{ano kako direktno strukturno i funkcionalno povrzuvawe me|u koskata i povr{inata za implantot. BAHA-sistemot e koskeno integriran implant i istovremeno e ponuda za alternativen metod na povrzuvawe na zvukot preku ~erepot. Negovata funkcija ne e da go zgolemuva ili reproducira zvukot, tuku da pomogne za prirodniot zvuk efektivno da dopatuva do kohleata.

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BAHA SYSTEM AND ITS USE

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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 mastoide 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.

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Toa e samo implantiran tretman {to raboti niz direktnoto koskeno povrzuvawe. Zatoa BAHA-sistemot e edinstvena izvonredna mo`nost za re{avawe na konduktivnata i me{anata zaguba na slu{noto o{tetuvawe.

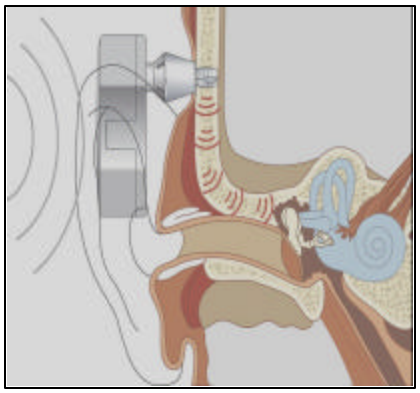
It is the only implantet treatment that work through direct bone conduction. The BAHA System is a unique and predictable solution for conductive and mixed loss hearing impairment.

Za kogo e namenet BAHA sistemot

BAHA-sistemot se upotrebuva kako aparat za lu|e so hroni~ni infekcii na u{ite, kade {to slu{niot kontinuitet e o{teten, kako kaj otosklerozata, travmata, hroni~niot otitis, hroni~nite infekcii na u{ite, kongenitalnata zaguba na sluhot, Tri~er Kolino-sindrom, steknatite drugi malformacii na srednoto ili nadvore{noto uvo {to rezultiralo so nedostig ili so nekompletno (sli~en kanal-atresija) i kaj ednostrana gluvost. BAHA-sistemot e sostaven od slu{en procesor so mala titaniumska fiksatura, implantirana hiru{ki zad uvoto. Sistemot go prima zvukot i go povrzuva, go prenesuva niz koskata do srednoto uvo, proces poznat kako DBC-direktno koskeno povrzuvawe {to zna~i deka vibraciite od zvu~niot procesor se prenesuvaat preku koskata do kohleata.

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.



Baha-sistemot se vgraduva so hirur{ka intervencija {to se izveduva za 45 - 60 minuti. Vo pove}eto slu~ai taa se izveduva pod lokalna anestezija, so smestuvawe mala titaniumska fiksatura vo mastoidnata koska zad uvoto.

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 zvu~niot procesor se mesti po 10 do 12 nedeli. Pred operativnata evoluacija na kandidatite za BAHA-sistemot vklu~uva kompletno medicinsko ispituvawe i iscrpna audiometriska evaluacija. BAHA-sistemot se vgraduva od petgodi{na vozrast i postari. Za pacienti pod petgodi{na vozrast se prepora~uva BAHA@Softband. Ima slu~aj koga BAHA-sistemot e vgraden na dete od samo pet meseci so obostrana kanalna atrezija. Cenata na BAHA-sistemot iznesuva 2.200 USA-dolari {to go pravi sistemot dostapen do lu|eto koi od nego imaat potreba.

Vo SAD od 1996 godina BAHA-sistemot od FDA (Ministerstvoto za lekovi i hrana) e prifaten kako tretman za konduktivno i me{ano gubewe na sluhot.

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

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

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 ear atrezia. 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 audiometric 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.

Praktiçki aspekti

Practical aspects

BAHA-zvu~niot procesor mo`e da se nosi pri site normalni aktivnosti, kako i drugite slu{ni aparati. Toj se vadi koga se spie, pri kapewe ili vodeni sportovi, dodeka specijalna za{tita e potrebna pri kontaktni sportovi. BAHA-sistemot e dizajniran kako kompatibilen so celularnite telefoni.

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.

Koga se upotrebuva telefon se dr`i blizu bez da se dopira BAHA-zvu~niot procesor.

BAHA-sistemot mo`e da se upotrebuva so FM-slu{nite sistemi i so infrared sistemite.

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.

Vidovi BAHA - sistemi

1. BAHA - klasik 300

Audiolo{ki indikacii:

BAHA-klasik 300 odgovara za pacienti so o{tetena koskena sprovodlivost do 45 db. na 0.5; 1; 2 i 4 kHz

Baterii tip: 675 od 1.4 volti

Golemina na procesorot: 34 h 22 h 10

Te`inata: 14 grama, vklu~uvajki ja i baterijata.

Boja na procesorot: mo`e da se najde vo 5 boi - crna, siva, `olta, sina i boja na ko-`a. Pridru`ni delovi: za{titno kapa~e, baterii, ~etkica za ~istewe.

Types of BAHA - systems

1.BAHA - Classic 300

Adiological Indicators:

The classic 300 is suitable for patient 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 blu - sound processor, abutment cover, battery, cleaning brush.

2. BAHA - kompakt

Audiolo{ki indikacii:

BAHA-kompaktot e pogoden za pacienti so prag na ~ist ton na koskenata sprovodlivost, za indikacija na 45 db. na izmeren sluh na slednive frekfrencii: 0,.5; 1; 2 i 4 kHz.

BAHA-kompaktot e pomal od Klasik 300. Toj e dizajniran za da napravi kompresija, da go limitira o{tetuvaweto i da go podobri kvalitetot na zvukot vo glasna sredina.

Mo`e da se nabavi vo tri boi: crna, siva i be` (boja na ko`a).

Baterii: tip 13.

Golemina: 30 h 17 h 10.

Te`ina: 11 gr. vklu~uvaj}i ja i baterijata.

2. BAHA - Compact

Audiological Indicators:

The Compact 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 Compact is smaller then 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 d. including battery.

3. BAHA - kordele 2

3. BAHA - Cordelle II

Audiolo{ki indikacii:

Kordele 2 se prepora~uva za pacienti {to imaat koskena o{tetenost od 70 db, na slednite frekfrencii 0.5; 1; 2 i 4 kHz

Transducerot, isto taka, ima mo`nost za izbor na tri boi: crna, siva i be` (ko`a boja), dodeka delot {to se nosi na pojas e so crna boja.

Baterii tip: 9 V za delot {to se nosi na teloto.

Golemina: 90 h 34 h 26.

Te`ina: 88 grama, vklu~uvajki ja i baterijata.

Te`ina na zadu{niot del: 20 gr.

Zaklu~ok

BAHA-sistemite vo momentov pretstavuvaat re{enie za lu|eto, osobeno za decata so karakteristi~ni o{tetuvawa na sluhot koi ne mo`e da gi koristat standardnite slu{ni pomagala - kanalni, intrakanalni. Istovremeno BAHA-sistemot e so izrazito poniska cena od Kohlearniot implantat. Negovata primena e od osobeno zna~ewe kaj decata od predu~ili{na i u~ili{na vozast koi ne mo`e da gi koristat standardnite slu{ni aparati i koi se sre}avaat so problemi vo izgradba na govorot i glasot.

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.

Literatura/References

1. Publication Entific Medical System-Bone Anchored Applications 1; 2004.

2. **Shanker V**, **Davison T**, **Johanson I** Newcastle BAHA Programme, Freeman Hospital, Newcastle, UK, 2004; 7.

3. Audilology Online, BAHA-Implantable Hearing System, 2004.

4. Edition Quality Standards in BAHA for Children and Young People, National Deaf Children's Society (NDCS) UK 2003.