

Connecting to sound

A new version of a bone-anchored hearing aid is safer, especially for children. *By Suki Lor*

WHEN HEARING LOSS is due to malformations or deformities in the outer or middle ear, a device known as a bone-anchored hearing aid or BAHAs can help transmit sound directly to the inner ear. This device works well in allowing the deaf to hear, but it runs the risk of injury when it is worn by young children.

This is because the hearing aid is designed to include a small titanium fixture that is surgically implanted in the skull, and an exposed screw for an external sound processor to be secured to. It is the screw that can cause problems like scratching, poor healing, infection or worse; one young wearer who knocked against something hard in the playground fractured her skull.

But a recent improvement has made the hearing aid safer, said Dr Barrie Tan, Senior Consultant and Head, Department of Otolaryngology, Singapore General Hospital (SGH).

Known as BAHAs Attract, this hearing aid uses the same components as the earlier version, but unlike its predecessor, it relies on magnets to connect the titanium fixture (which is implanted with a magnetic metal plate) to the sound processor.

“Even when there is head contact during contact sports, the impact is

spread out over a much larger area, lowering the risk of traumatic skull injuries,” said Dr Tan.

Both versions work on the same principle: sounds received and transmitted by the processor to the titanium implant vibrate the skull and inner ear, stimulating the nerve fibres of the inner ear. The sound vibrations bypass the non-functioning outer and/or middle ear to directly stimulate the functioning cochlea, the organ which carries sound information to the brain, to allow the BAHAs wearer to hear.

Besides being safer, recovery from surgery to embed the titanium implant for BAHAs Attract is faster, and post-procedure complications are fewer, said Dr Tan.

Patients who have been fitted with a BAHAs with the exposed screw have more regular reviews to ensure that the surgical wound is healing properly and that there are no infections or complications. Osteo-integration, or fusing of the device with the bone as the wound heals, takes longer.

“It takes three months or so before the processor can be loaded and fixed,” said Mr Deepak D’Souza, Senior Principal Audiologist and Deputy Manager, Centre for Hearing and Ear Implants, SGH.

With BAHAs Attract, it takes just a



PHOTOS: JUSTIN LOH

➤ The new BAHAs Attract uses magnets instead of screws to connect the titanium structure embedded in the skull to the sound processor. This makes it safer for the user.



EVEN WHEN THERE IS HEAD CONTACT DURING CONTACT SPORTS, [WITH BAHAs ATTRACT], THE IMPACT IS SPREAD OUT OVER A MUCH LARGER AREA, LOWERING THE RISK OF TRAUMATIC SKULL INJURIES.

DR BARRIE TAN, SENIOR CONSULTANT AND HEAD, DEPARTMENT OF OTOLARYNGOLOGY, SGH

month before the processor can be used. There are also no longer term issues as with the original BAHAs which requires daily care and cleaning around the exposed screw to avoid infection.

The conventional BAHAs has been in use for some 20 years, while BAHAs Attract became available about two years ago, said Dr Tan, who is also Director of SGH’s Centre for Hearing and Ear Implants.

In Singapore, the new system was cleared for use more recently. The first

person to be fitted with a BAHAs Attract had it done in September last year at SGH. Another patient, a 10-year-old boy with a congenital deformity known as microtia, underwent the minimally-invasive procedure at SGH to be fitted with the same system a month after.

People with microtia – a condition in which the external ear is underdeveloped – also often don’t have an ear canal as their ear is one block of solid tissue, said Dr Tan. “There’s no tunnel to transmit the sound waves and no ear drum to talk about. So surgery cannot correct these abnormalities.”

When hearing loss is due to such congenital obstructions in the outer and/or middle ear, conventional hearing aids can’t help because they only amplify sounds and aren’t able to push the sounds through to reach the functioning inner ear.

As for people whose deafness comes from a defective cochlea, a cochlear implant can be put in to directly stimulate the hearing nerves. In very rare cases of profound hearing loss where there are problems with the nerve that transmits sound to the brain, an auditory brainstem implant can help.



➤ Bone-anchored hearing aids help transmit sound directly to the inner ear when hearing loss is due to malformations or deformities in the outer or middle ear, said Dr Barrie Tan (left with Mr Deepak D’Souza).