Bone Anchored Hearing Aids
B.A.H.A

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23 Moharram 1426
Specific Indications

• Intolerance of conventional hearing aids
  – Draining ear
  – Mastoid cavity (feedback)
  – Topical sensitivity
• Congenital malformations
  – Microtia / atresia
  – Syndromic / sporadic
• Conductive loss in an only hearing ear
• Single-sided deafness
Conductive Defects

- Wax & foreign bodies
- Otitis externa
- Acute suppurative otitis media (ASOM)
- Otitis media with effusion (OME)
- Chronic otitis media (CSOM)
  - Scarring; perforation
- Cholesteatoma
- Otosclerosis
- Ossicular chain disruption
# Drawbacks traditional alternative

<table>
<thead>
<tr>
<th>Air conduction devices</th>
<th>Reconstructive surgery</th>
<th>Bone conduction devices</th>
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<tbody>
<tr>
<td>- Presence of ear mould aggravates infection</td>
<td>- Potential risk of hearing damage</td>
<td>- Discomfort</td>
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<tr>
<td>- Acoustic feedback</td>
<td>- Less predictable outcome</td>
<td>- Poor sound quality</td>
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<tr>
<td>- Dependent on middle ear function</td>
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<td>- Cumbersome</td>
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## Advantages

<table>
<thead>
<tr>
<th>Over air conduction devices</th>
<th>Over reconstructive surgery</th>
<th>Over bone conduction devices</th>
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<tbody>
<tr>
<td>• No occlusion of the ear canal</td>
<td>• Predictable results</td>
<td>• More comfortable</td>
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<tr>
<td>• No feedback problems</td>
<td>• Low risk for the patient</td>
<td>• Better sound quality</td>
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<tr>
<td>• Sound bypasses the middle ear</td>
<td>• Reversible surgery</td>
<td>• Aesthetic appearance</td>
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</tbody>
</table>
- Classic
- Compact
- Cordelle
- Digital
Contraindications

• Average bone threshold worse than 45 dB
• Patients who may be non-compliant
  — Anatomical
  — Psychiatric
  — Social

These are recommendations and not absolute contraindications

FDA approved for children above the age of 5
Basic principles

• Careful patient selection

• Meticulous surgical technique
  – Secure osseointegration
  – Stable skin surrounding the implant site
Patient selection

- Medical
- Audiological
- Psychological
Pre-implantation assessment

- Pure tone audiogram B.C. 45dB

- Speech Discrimination score >60%

- “Bite bar”

Try them today

- “Head band”
Pre-Op Assessments

- 78 Y
- Rt dead ear (XRT)
- Left ear
  - Mix HL
  - HA
  - Wet
- Video
Pre-operative test equipment
Pre-implantation assessment

• Verbal & written information exchange

• entific.com website

• Meet implantee
Contraindications

- Poor Hygiene
- Insufficient bone volume
Surgical technique

- Single – stage
- Two stages
- General or local anaesthetic
Two stages
Surgery
Preparation

• Mark skin

• Infiltrate
Skin graft technique
Skin graft technique

- Modification

- Inferiorly-based implant-site split-skin graft

- Knife
Wide under-mining of soft tissues
Different way
Removal of peri-cranial tissues

Clean skin graft
Test drill & countersink

• High speed drill
  – 3 mm
  – 4 mm
  – Countersink

• Constant irrigation

• Check for adequate bone thickness
Fixture placement

- Slow speed drill
- Constant irrigation
Replace graft and suture
Graft
Suture
Layered sponge dressing & healing cap
Layered sponge dressing
Healing cap
Essential steps

- Take the split-skin graft as thin as possible
- Widely undermine the edges
- Over-excise soft tissue esp. superiorly
- Remove peri-cranial tissues down to periosteum
- Drill with correct speed and always with cooling
First visit
First visit
The ideal implant site

- Thin
- Hairless
- Immobile
Post-op guidelines

• OPA. 1 week post-op.
  • Remove healing cap
  • Change dressing (possibly reapply)
  • Clean wound (polysporin)

• OPA. 2 weeks later
  • Clean wound

• OPA 1 month later
  • Baby’s tooth brush

• Fitting @ 3 months post-op
Cleaning with brush
Hygiene
Fitting
Complications
Complications

- Wound complications
  - Infection/granulation
  - Overgrowth of soft tissue
  - Skin graft non-take

- Operative complications
  - Unable to find bone thick enough
  - Sigmoid sinus injury
  - Dural Injury
  - Facial nerve injury

- Bone complications
  - Non-osseointegration
  - Bone fracture
In reality: most common problems

- Skin site granulation
- Sagging and drooping of superior skin
- Thickening of subcutaneous tissues
- Whistling and feedback
- Insufficient power
- Skull numbness or pain
- Placed too far back
The ‘drifter’
Sebaceous skin at graft site
Poor hygiene
Hygiene
Complications - granulation
Infected sebaceous cyst
The ‘overhang’
Cases
Case

- 4 Y Girl
- Congenital Aural Atresia
- For atresia repair consult
Microtia / atresia
Microtia
Case

- 17 Y
- Left FD → SNHL
- Right CSOM
- HA not good
- ? Right / Left BAHA
Case

• 19 Y old Female
• Hemifacial microsomia
• Bilateral CSOM
• Can not use HA
• Bilateral CHL 45 db
Hemifacial microsomia
Case

- 75 Y old Male
- Left Lipoma
- Florid granulation tissue
- Debridement
- Topical cautery
Case

- 44 Y Old Female
- Left severe retraction
- Fail surgeries post-Stapedectomy
- No more ear surgery
- Policewoman
- Video-1
- Video-2
Nonsurgical Treatment
Paediatrics
Add Speech presentation
Summary

- BAHA is excellent for bilateral conductive hearing loss with good bone curve
- Less benefit for unilateral conductive loss
- Better than CROS aids
- Problems are relatively minor
- Skin graft site is the biggest early and long term challenge
- Easy operation, but lots of little “tips”
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THANK YOU