BONEBRIDGE IN CHILDREN WITH PINNA ABNORMALITIES AND CANAL ATRESIA

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Introduction

- A new active osseo-integrated transcutaneous bone conduction implant
- Transmits sound waves through cranial bone directly to inner ear
- First implantation in Malaysia in 2012
- Indicated in children/adolescents with conductive or mixed hearing loss due to pinna abnormalities and canal atresia, either bilateral or unilateral
**INDICATIONS**

**Bone conduction thresholds**

**Air conduction thresholds**
OBJECTIVES

- Surgical outcomes
  - Surgical techniques
  - Complications
- Audiological outcomes
  - Efficacy
  - Safety
  - Device satisfaction
METHODS

- Prospective, single-subject repeated measures design from 2013 – 2016
- 2 tertiary centres in Malaysia: Sarawak General Hospital & University Malaya Medical Centre
- Children/adolescents aged 18 and below with pinna abnormalities and canal atresia
- Fulfilled criteria of BB implantation
- A trial of bone conduction hearing aid is a MUST
METHODS

- Reviewed demographics data & medical parameters
- Assessed surgical outcomes
  - Preoperative preparation, surgical techniques, complications
- Assessed audiological outcomes
  - Audiometric thresholds (BC, AC & HL at 250Hz to 8kHz) preoperatively & 6 months postoperatively
  - Device satisfaction: Hearing Device Satisfaction Scale (HDSS) questionnaire
- Analysed with SPSS version 22
SURGICAL TECHNIQUE
RESULTS

• 6 patients were included

• Male:Female : 4: 2

• Range of age : 11 to 18

• Preoperatively, HRCT temporal bone is a MUST
<table>
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<th>No</th>
<th>Age</th>
<th>Sex</th>
<th>Implanted ear</th>
<th>Type of HL</th>
<th>Cause of HL</th>
<th>PTA&lt;sub&gt;4&lt;/sub&gt; BC Pre-Implanted Ear (dB HL)</th>
<th>PTA&lt;sub&gt;4&lt;/sub&gt; AC Pre-Implanted Ear (dB HL)</th>
<th>PTA&lt;sub&gt;4&lt;/sub&gt; HL Post-Implanted Ear (dB HL)</th>
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<td>L</td>
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<td>L Canal Atresia</td>
<td>12</td>
<td>82</td>
<td>21</td>
</tr>
</tbody>
</table>
• All 6 of them have conductive hearing loss due to canal atresia & pinna abnormalities
PLACEMENT OF BC - FMT

- Sinodural Angle
- Retrosigmoid

1
5
COMPLICATIONS

• No major complications noted

• 1 patient: mild infection at surgical wound, recovered within a week with local & oral antibiotics
Hearing Level ($PTA_4$) Pre (AC & BC) & Post implanted Ear in 6 patients
Mean bone conduction thresholds for the implanted ear: preoperative unaided compared with 6-month postoperative

(P > 0.05)
Mean air conduction thresholds for the implanted ear: preoperative unaided compared with 6-month postoperative

- Preoperative
- 6 month postoperative

( P > 0.05)
Mean soundfield thresholds for the implanted ear: preoperative unaided compared with 6-month postoperative aided

( P < 0.05)
• Audiometric thresholds for AC & BC showed no significant change pre and 6-month post operative (P > 0.05) for 500 to 4000 Hz

• Sound field testing showed significant change pre and 6-month post operative (P<0.05) for 500 to 4000 Hz
Discussion

- Mean aided sound field thresholds improved > 30 dB from 500 to 4000 Hz.
- Patients’ residual unaided hearing did not deteriorate by the treatment. Mean unaided AC & BC thresholds pre & post operative (6-month) changed < 5 dB with insignificant statistically from 500 to 4000 Hz.
- Acceptable level of safety in term of surgical techniques and surgical complications.
- All the patients were very satisfied (> 90%) with the implant in terms of improvement of the aided hearing thresholds and acceptable cosmetic appearance of the sound processor.
CONCLUSION

• Another alternative treatment after failed conventional hearing aids.

• Safe and effective in improving patients’ hearing thresholds from the age of 5 years old and above in pinna abnormalities and canal atresia with conductive hearing loss.
NOW YOU SEE!
NOW YOU DON’T!
THANK YOU

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Kuching is awesome