Retrospective analysis of ear choice, and the effect on outcomes in adult unilateral Cochlear Implant (CI) recipients

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Introduction

- Most adult NHS patients who meet criteria are eligible for a unilateral Cochlear Implant (CI) (3). Typically, unless one side is contraindicated patients can choose which ear is implanted.
- Previous research suggests that whether the better or worse ear is implanted does not influence outcomes (1,2), and around 2/3 patients are implanted in their worse ear (2).

Research questions

1. Do adult CI candidates choose their better or worse ear for implantation?
2. Is there an effect of ear choice on post-implantation speech discrimination, and on patient satisfaction (GAST questionnaire score)?
3. Is there a difference in the percentage of patients making use of bimodal listening post-implant dependent on better or worse ear implanted?

Method

A retrospective analysis was carried out at St Thomas' Hearing Implant Centre. Patients with a clinically significant pre-implant asymmetry in speech testing were included in the study.

- A total of 244 patients were identified since the start of 2018.
- Twenty-nine patients had clinically significant asymmetries in their speech test results and were able to choose implanted ear.
- Patients not able to choose were included for the second and third research question (n=42).
- They were split into groups based on better or worse ear implanted and were compared on the available demographic factors including age at implantation, left or right ear implanted, duration of severe-profound hearing loss (overall and implanted ear), and gender.
- Independent samples t-tests and Mann-Whitney U tests were used to compare outcomes for the better and worse ear implanted groups.

Results

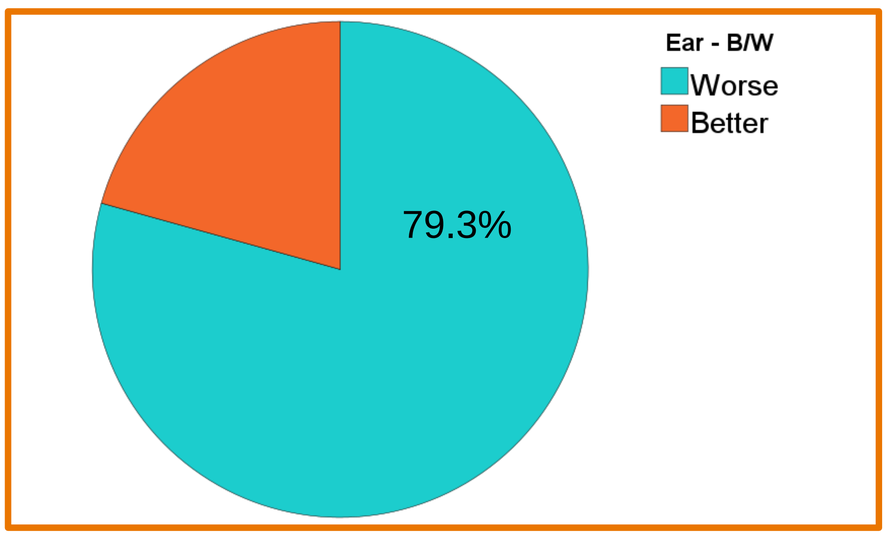

Figure 1: Pie chart showing whether patients chose to have their better or worse ear implanted.

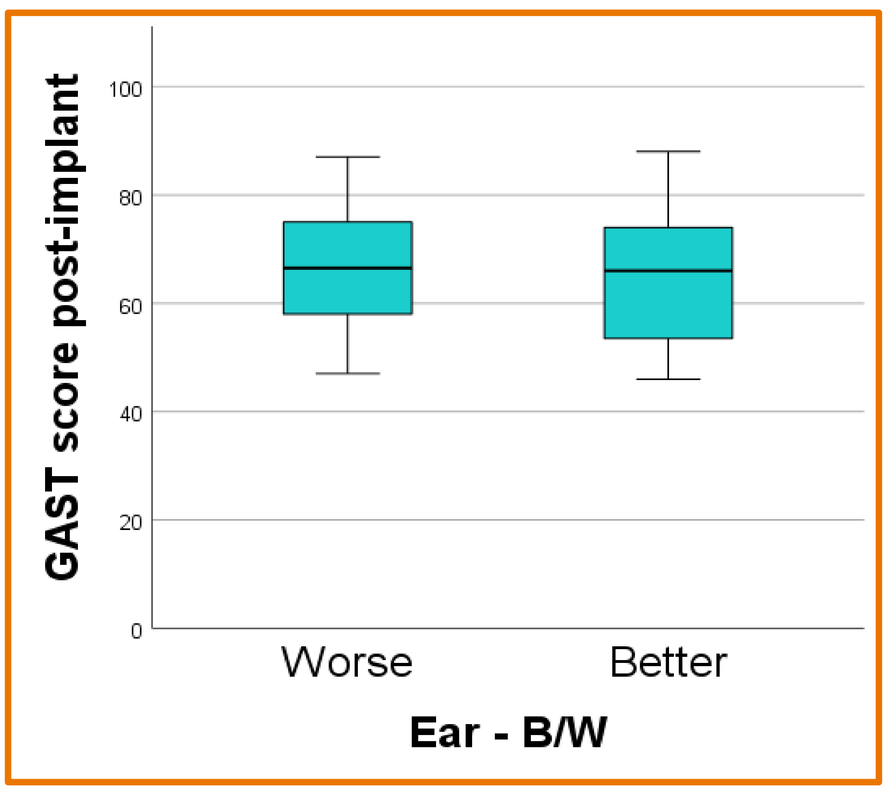

Figure 2: Boxplot showing GAST questionnaire scores post-implant when patients are separated by implanted ear.

- Most patients chose to be implanted in their worse ear (figure 1).
- The better and worse ear groups did not significantly differ on demographic factors (p>.05).
- There was no significant difference in patient satisfaction (GAST raw score (p=.88), or pre-post implant GAST score difference (p=.69)) between patients implanted in their better or worse ear (figure 2).
- There was some difference in speech test scores favoring the worse ear, this was statistically significant for the AB phoneme score (p=.038) (figure 3) and BKB male version (p=.016), but not for the BKB female version (p=.58).
- More patients implanted in their worse ear were able to use bimodal listening post-implant (Table 1).

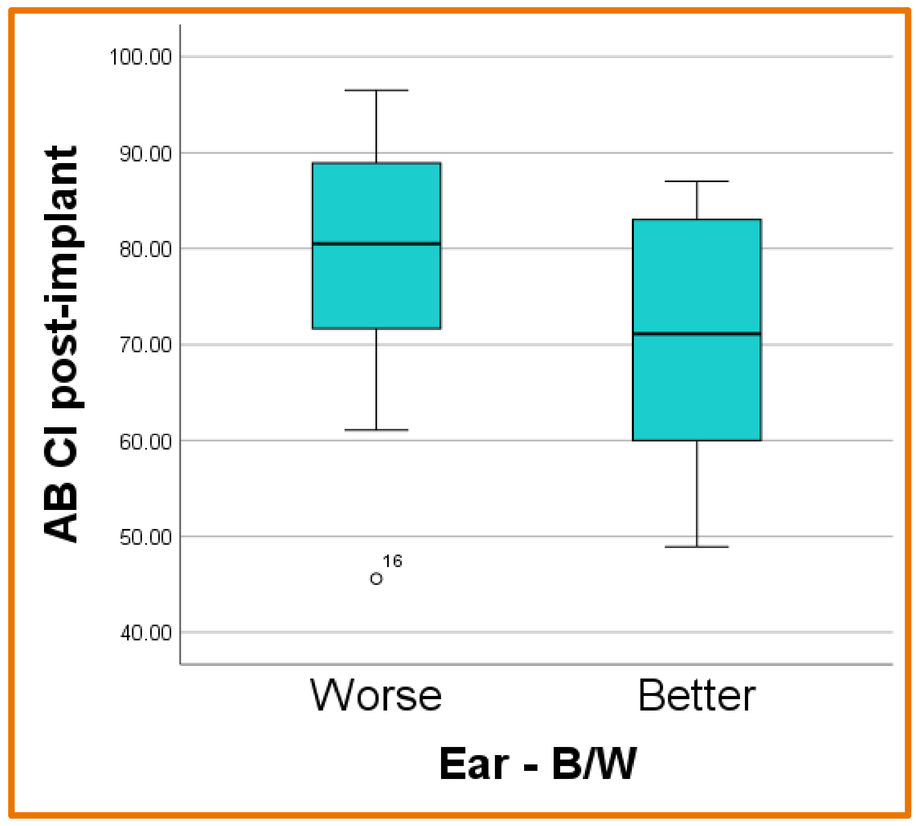

Figure 3: Boxplot showing AB word phoneme scores at 9m review when patients are separated by implanted ear. An outlier is represented by the number 16.

Implanted ear	Consistent CI + HA	CI only	CI + CROS
Worse ear	62.5%	37.5%	0%
Better ear	27.8%	55.6%	16.6%

Table 1: Table showing percentage of patients who were using a unilateral CI at 9 months post-implant compared to a CI and contralateral hearing aid or CROS aid.

Discussion & Conclusion

- In this study a higher percentage of patients chose their worse ear compared to what has previously been suggested.
- There was some difference in speech test results between the groups, however there was a large variation in results for all the speech tests and significant overlap between the groups.
- It could be argued that patient satisfaction is more important to clinical significance than speech test scores.
- There is no indication that implanting the better ear leads to better outcomes. This finding agrees with previous research suggesting there is no difference in outcomes dependent on implanted ear (1,2).
- There is a higher likelihood of bimodal listening when the worse ear is implanted.

References
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