

Sound Localization with Bilateral Bone Conduction Devices

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Background & Aim

Additional value of a second BCD previously investigated (Bosman et al. 2001)

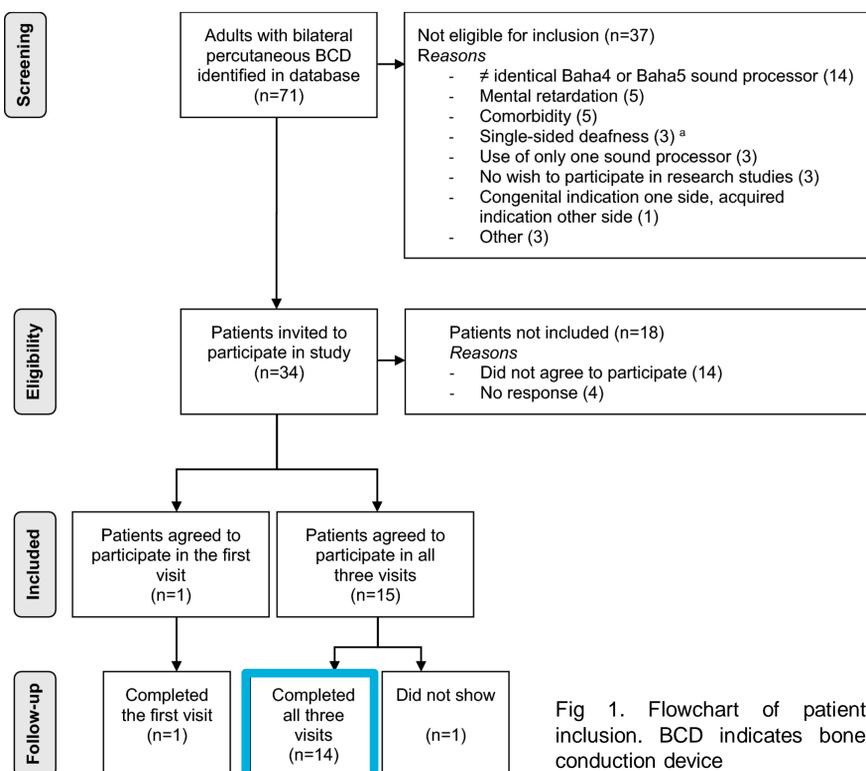
- Speech perception in quiet/noise ↑
- Hearing-related quality of life ↑
- Sound localization / lateralization performance ↑

Aim current study

- Evaluate sound localization performance in more detail
- Is an improvement in sound localization performance possible?
 - Optimization device settings
 - Localization practice with visual feedback

Methods

Study population



Results

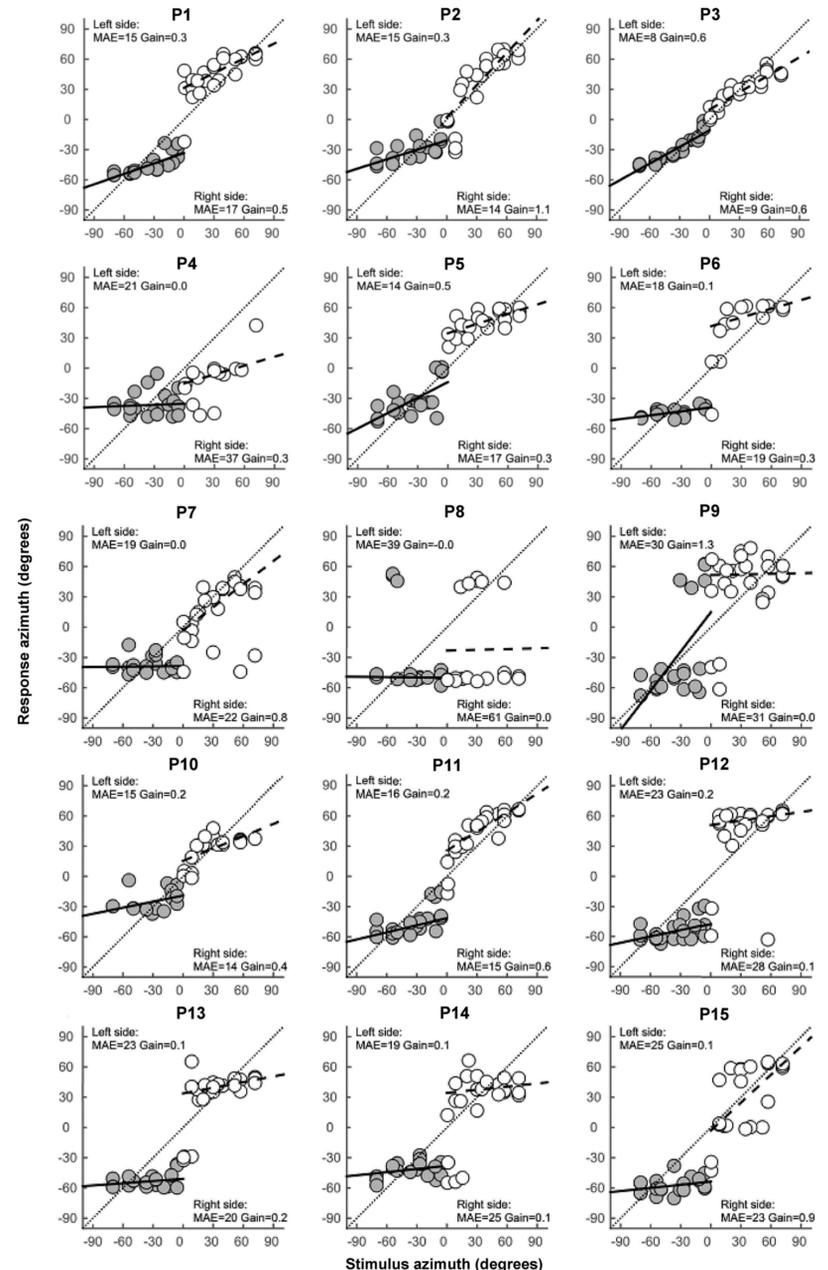


Fig 2. Sound localization stimulus-response plots for all patients in the bilateral aided condition at first visit with their original device settings. The target location is plotted on the horizontal axis and the target response on the vertical axis. Negative values represent targets/responses on the patient's left side and positive values represent targets/responses on the patient's right side. Gray circles represent targets on the patients' left side and white circles represent targets on the patient's right side. For a good performer, all data points will fall along the diagonal resulting in MAE smaller than 10° and a gain close to 1. Results are shown for broadband stimuli pooled for the 45, 55, and 65 dB presentation levels in the bilateral aided condition

Conclusions

Direction hearing with bilateral bone conduction devices

- (some form of) localisation possible with bilateral fitted BCD's
 - Also in congenital cases and asymmetry ≥ 10 dB
- Lateralisation possible for almost all patients; highly relevant in daily life

Device optimisation (linear gain and automatics off) & practice session

- No effect on localisation performance
- Significant effects on subjective outcomes
 - SSQ - Gatehouse & Noble (2004)
- Subjective preference for new device settings in 13 subjects
 - Clearer & sharper sound

Measurement Directional Hearing

- 24 loudspeakers [-70° ... +70° azimuth]
- Head-pointing technique
- Stimuli (randomly presented)
 - 45 Broad-band 0.5 - 20 kHz at 45, 55, 65 dB SPL
 - 15 High-Pass 3.0 - 20 kHz at 55 dB SPL
 - 15 Low-Pass 0.5 - 1.5 kHz at 55 dB SPL

Three visits with a total of four sessions

- S1-4: measurements of directional hearing
- DS: device settings: linear gain, omni-directional, noise reduction off
- PS: practice session with visual feedback



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