Sound Localization with Bilateral Bone Conduction Devices
EAONO Week Virtual Congress – 6-10 September, 2021

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

Results

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

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
• Subjective preference for new device settings in 13 subjects
  – Clearer & sharper sound

Acknowledgements: The authors thank Katharina Vogt for contributions in sound localization measurements and analyses.

Funding: This study was funded by Cochlear Bone Anchored Solutions AB (Mölndal, Sweden).

Conflict of interest: Outside this work, the authors report financial support to the authors’ institution (Radboudumc) for conducting clinical studies from Cochlear Bone Anchored Solutions AB (Mölndal, Sweden) and Cochlear Medical AB (Askim, Sweden). The authors declare that they have no other conflict of interest.