Long-term clinical outcomes of percutaneous implants for bone conduction devices:
Prospective five year evaluation of different implant designs and surgical techniques

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Introduction
• Several changes in implant design and surgical technique have been made aiming to decrease complications in BAHIs
• Although implant survival of the 4.5-mm wide implant is high, a difference in survival compared with the 3.75-mm wide implant has not been found in previous investigations
• Tissue preservation showed more favorable results regarding skin sensibility and cosmetic outcomes

But what are the long-term clinical results of this newer implant and surgical technique?

Objective
Evaluation and comparison of the clinical outcomes at 5-years of:
1. 4.5-mm-wide implant, and (previous) 3.75-mm-wide implant
2. Linear incision technique with tissue preservation, and tissue reduction

Methods
• Single follow-up visit of two previously completed clinical studies1,2
• Study A - 57 patients; 37 in test and 20 in control
  - Test implanted with 4.5-mm-wide implant
  - Control implanted with 3.75-mm-wide implant
• Study B - 50 patients; 25 test, 25 control
  - All patients implanted with 4.5mm implant
  - Test tissue preservation, control tissue reduction
• Outcome measures
  • Implant stability and intrasubject stability over time
  • Implant survival
  • Skin height
  • Sensitivity around abutment + subjective numbness (study B)

Results
• Study A: 48 patients (84%) completed the 5-year follow-up
• Study B: 39 patients (79%) completed the 5-year follow-up

Clinical outcome
| Implant survival (test vs. control) | A: 97.4% vs 95.0% | B: 96% vs 100% |
| Adverse soft tissue reaction (test vs. control; Holgers-score) | A: 15.2% vs 23.5% | B: 30.0% vs 10.5% |
| Skin sensibility | 96.7% vs 96.3% |
| ISQ | Shown in figures below |

Discussion
• Both implants have excellent survival rates, with higher resonance frequency properties for the 4.5-mm-wide implant
• Between both surgical techniques, no differences in adverse skin reactions or implant survival were observed at 5-years
• Due to the presumptive better stability the 4.5-mm-implant is preferred over the 3.75-mm-wide implant
• Due to shorter surgery time, less invasive character and comparable outcomes, tissue preservation is preferred over tissue reduction

Conclusion
At 5-year follow-up, high implant and abutment survival rates were observed. Adverse skin reactions occurred in a minority of implants and did not significantly differ between groups. It can therefore be concluded that the 4.5-mm-wide implant, as well as the linear incision technique with soft tissue preservation procedure are safe in the long-term.

Fig 1a. Box-and-Whisker plots of ISQ-low and high study A

Fig 1b. Box-and-Whisker plots of ISQ-low and high study B

References
1 Kruyt IJ et al. 2018. doi:10.1097/mao.0000000000001761
2 Kruyt IJ et al. 2019. doi:10.1097/mao.0000000000002105

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