First results of a new coupling device for precise round window coupling of the Vibrant Soundbridge

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Round window coupling:

- Placement of tissue behind FMT to get contact to RWM
  - **Undefined** contact forces between RWM and FMT
  - Stiff material behavior of cartilage

Design Hannover-Coupler:

- Spring replaces tissue
  - **Standardized** coupling
  - **Controllable** and constant contact of FMT to RWM
  - **Mobility** of FMT
Development Steps of Coupler

HC-V1

HC-V2

Silicone cap

FMT-Clip

Pin

Spring
Material and Method
Round Window Coupling - Patients

- 9 patients treated with Hannover Coupler CMD
  - 8 mixed hearing loss
  - 1 sensorineural hearing loss

- All patients had history of multiple middle ear surgeries before coupler implantation
Left Ear
Case Presentation

• Patient HC2_4:
  – Right ear
  – Male, age at implantation 47,1
  – Chronical mastoiditis
  – Obliteration 03/2017
  – Implantation 01/2018
Results
Pure tone audiometry - preoperative

Air conduction (AC) preoperativ

Bone conduction (BC) preoperativ
Pure tone audiometry - Initial fitting

Air conduction (AC)
preoperativ

Vibrogramm (Vibro)
initial fitting

preoperative
Pure tone audiometry - Initial fitting

Air conduction (AC) preoperative

Aided thresholds (ABK) initial fitting

dB (HL) vs Frequency (Hz)

Patients: HC_1, HC_2, HC_3, HC_4, HC_5, HC_6, HC_7, HC_8, HC_9
Speech testing

WRS in quiet
Freiburg Monosyllables

SRT in quiet
German Matrix Test (OLSA)

SRT in noise
German Matrix Test (OLSA)

WRS in quiet [%]

SRT in quiet [%]

SRT @ 65 dBA noise level [dB SNR]

Prä-OP  EA  3M  6M
Pre OP  3M  6M
Pre OP  3M  6M

HC_1  HC_2  HC_3  HC_4  HC_5  HC_6  HC_7  HC_8  HC_9

Better
• However:
  – 1 patient received a CI after surgery (No. 07) (no benefit)
  – 1 patient planed for revision (No. 09) (Suspicion of defect implant)
Conclusion

- 9 patients implanted with Hannover Coupler
- No negative effect on inner ear function
- Coupler is mechanical stable
- Enlargement and bending possible
- Good handling in complicated anatomical cases
- Good and stable results in speech testing
Thank you for your attention!