Bone-Implant Interface of a Three-Component Total Ankle Replacement: Histological Analysis of Five Retrieved Implants

Beat Hintermann, Alexej Barg, Markus Knupp
My disclosure is in the Final AOFAS Program Book and in the *Orthopaedic Surgeon’s Disclosure Program* database.

I have a potential conflict with this presentation due to:

consultant for INTEGRA
Purpose

To assess the osteointegration process on retrieved implants of different generations based on histological analysis.
HINTEGRA Design

Non-constraint, 3-component system

3 generations:

1. HA single coat, no pegs
2. Porous CoCr (200µm) with HA, no pegs
3. Porous Titanium (200µm) with HA, 2 pegs
Case – 1st Generation

f, 52 y
- 8.6y after TAR
  ➔ posttraumatic OA
  ➔ pilon tibial fracture
- motion
  ➔ DF / PF 5 – 0 - 20°
- chronic pain
- will fusion
Case – 2\textsuperscript{nd} Generation

\textbf{m. 71 y}
- 6.8y after TAR
  - \textit{peroneus nerve palsy}
  - \textit{cannot control ankle}
- \textit{pain free motion}
  - \textit{DF/PF 10 – 0 - 25°}
- \textit{difficult to brace}
- \textit{will fusion}
Case – 3rd Generation

f, 48 y
• 6.2y after TAR
• history
  → 2 x mosaicoplasty
• stiffness
  → equinus 3°
• refused proposed fusion
• now: will fusion
Conclusion

- Single HA coating
  ➔ inferior osteointegration when compared to double coated implants
- trabecular bone
  ➔ circumferential bony support through the cortical rim
  ➔ stress shielding even due to 6mm pyramidal peaks
- precise bony cuts
  ➔ may be decisive for bony ingrowth / interface