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Title
Osseointegration implant failure and surgical revision in persons with bone-anchored prosthesis after transfemoral amputation

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Summary
Possible risk factors for breakage of the intramedullary stem were small stem diameter and higher infectious events. No risk factors were associated with breakage of the dual-cone adapter. All patients with a broken implants were successfully revised with a titanium stem with a greater diameter.

Introduction/ basics
Stem breakage due to metal fatigue is a rare but well-known cause for failure of orthopedic implants. This may also affect the components of the osseointegration implant (OI) system for individuals with transfemoral amputation with subsequent need for revision. Identification of risk factors is important to prevent implant failures. The aim of this study is to identify possible risk factors for failures of the intramedullary stem or dual-cone adapter (DCA) of an osseointegration implant (OI) system. Additionally, we describe the surgical revision strategy and technique that was performed.

Material method; implementation/ process
All consecutive patients who had undergone treatment with a standard CE-certified press-fit cobalt-chromium-molybdenum transfemoral OI between May 2009 and July 2015 were eligible for inclusion. We compared patient characteristics (gender; age; body-mass index), implant details (diameter of the intramedullary stem; length of dual-cone; implant survival time), and event characteristics (infectious complications; distal bone resorption) of patients with and without failure of the OI system.

Results

In total, 58 (59 implants) of 60 eligible patients were included, including 7 patients with an intramedullary stem failure (6 breakages and 1 septic loosening) and 13 individuals with a DCA failure (10 weak-point breakages and 4 distal taper breakages). Patients with a stem failure had a significantly smaller intramedullary stem diameter and more infectious events than patients without stem breakage. No risk factors could be identified for DCA failures.

Discussion/ conclusion; conclusion for the practice

In this study possible risk factors for OI system failure were identified including small stem diameter and number of infectious events. All patients with an intramedullary stem failure underwent successful revision with a titanium OI with larger diameter. All DCA failures were successfully solved, mostly in an outpatient setting.

References

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Image: Figure implant breakage_164.jpg

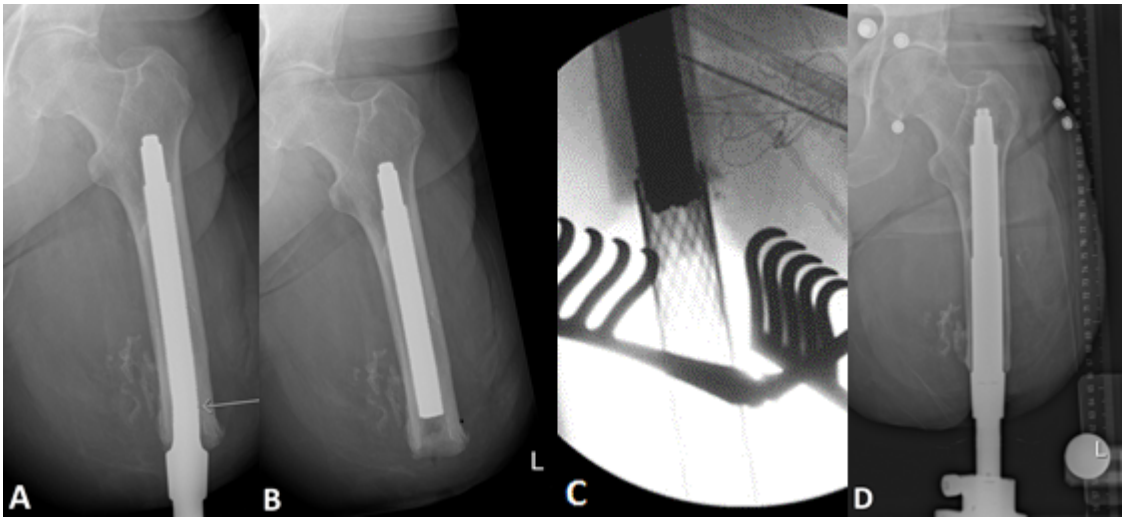

Image: Figure septic loosening_165.jpg