Osseointegration Implant Failure and Surgical Revision in Persons with a Transfemoral Bone-Anchored Prosthesis

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Purpose: The aim of this study was to identify potential risk factors for transfemoral osseointegration (OI) implant failure and describe the surgical revision strategy and technique that was performed.

Methods: This retrospective cohort study includes all patients treated with a press-fit cobalt-chromium-molybdenum transfemoral OI implant between May 2009 and July 2015. We analyzed the patient characteristics, implant details, and event characteristics in patients with and without failure of the OI implant system. The revision of a failed intramedullary stem due to breakage consists of three stages in which the broken stem is removed in two separate procedures with a custom-made water-cooled hollow drill. Finally, after wound-healing, the new intramedullary stem is installed. In case of septic loosening of the intramedullary stem, the stem is removed in two separate stages by using a high-speed surgical saw and water-cooled hollow drill. Bone cultures are taken during these procedures. When these cultures are negative, a third surgery is performed to install the new intramedullary stem.

Results: Of the 58 patients included, 6 patients had breakages and 1 septic loosening. The cumulative survival rate was 77% after 9.0 years. These patients had a significantly smaller intramedullary stem diameter and more infectious events compared to the non-failure group.

Conclusion: Small stem diameter and number of infectious events are possible risk factors for OI implant system failure. All seven patients underwent successful revision with a larger diameter titanium OI implant.