Title

What Are the 5-year Survivorship Outcomes of Compressive Endoprosthetic Osseointegration Fixation of the Femur?

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What are the 5-year survivorship outcomes of compressive endoprosthetic osseointegration fixation of the femur?

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Abstract

Background: Aseptic complications such as stress shielding leading to bone loss are major problems associated with revision of cemented and uncemented long-stem tumor endoprostheses. Endoprosthetic reconstruction using compressive osseointegration fixation is a relatively new limb salvage technology designed to enhance osseointegration, prevent stress shielding, and provide fixation for short end-segments.

Questions/purposes: (1) What is the survivorship of this technique at minimum 5-year followup? (2) Were patient factors (age, sex, body mass index), oncological factors, or anatomic locations associated with implant failure? (3) Were there any prosthesis-related variables associated with failure?

Methods: A single-center, retrospective review of patients with a minimum 5-year followup (mean, 8 years; range, 5-12 years) treated with an osseointegration compressive device for endoprosthetic fixation of proximal and distal femoral limb salvage reconstructions was performed. We have previously published the implant survivorship of this patient cohort with a minimum 2-year followup and are now reporting on the 5-year survivorship data. From 2002 to 2008, we performed 22 such procedures in 22 patients. Four patients died of their disease within 5 years of surgery and all surviving patients (n = 18) had complete followup data at a minimum of 5 years. General indications for this device during that time were pediatric and adult patients requiring primary endoprosthetic reconstructions of the proximal or distal femur for benign and malignant bone lesions. The primary outcome was reoperations for mechanical (aseptic) failures. Secondary outcomes included implant removal for nonmechanical failures and any patient-, oncological-, or implant-related variables associated with implant removal.

Results: At a minimum of 5 years followup, overall mechanical (aseptic) implant survivorship was 16 of 18. Survivorship for all modes of failure (oncological failure, infection, arthrofibrosis, and mechanical failure) was 12 of 18. All mechanical failures occurred early, within the first 30 months. We identified no patient-, oncological-, or implant-related features predictive of failure.

Conclusions: Our intermediate-term experience with compressive osseointegration fixation for endoprosthetic limb reconstructions demonstrates with longer clinical followup, no additional mechanical failures were observed as compared with our early analysis. Our experience with this fixation at a minimum of 5-years followup adds to a very limited but increasing body of literature demonstrating that after a transient period of increased risk for implant failures, survivorship stabilizes. Assessment of this fixation strategy beyond 10 years of clinical followup is needed.

Level of evidence: Level IV, therapeutic study. See Guidelines for Authors for a complete description of levels of evidence.

Figures

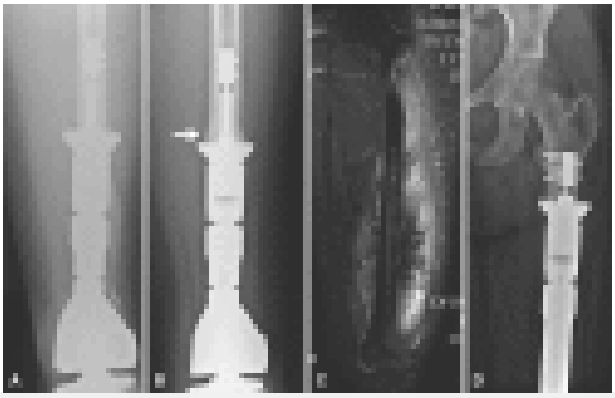

Fig. 1A–D

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Radiographs demonstrating some of the…

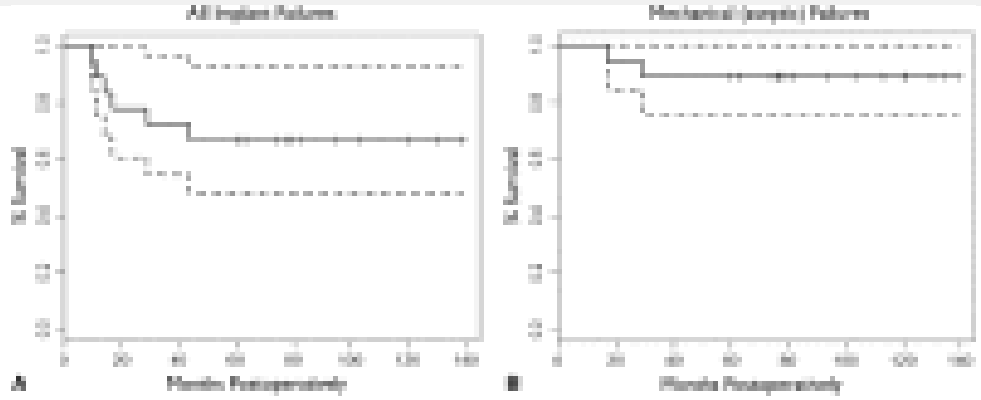

Fig. 2A–B

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Kaplan-Meier plots demonstrating survivorship of…