

Results of Revision Cemented Endoprostheses

Nicholas M. Bernthal, M.D., Chandhanarat Chandhanayingyong, M.D., Frederick Eilber, M.D.,
Fritz C. Eilber, M.D., Jeffrey J. Eckardt, M.D.

University of California, Los Angeles (UCLA)

MSTS/ISOLS # 11427

Background: Cemented endoprosthetic reconstruction after resection of primary bone sarcomas has been a standard-of-care option for more than three decades. As patient survival has improved and utilization of these prostheses have expanded, the incidence of failed endoprostheses requiring revision surgery has increased. Revision of cemented endoprostheses is technically demanding and has often been listed as a rationale against using these implants. This study aims to examine the clinical outcomes of revision cemented endoprosthetic reconstructions using a cement-in-cement technique.

Questions: 1) What is the durability of revision cemented endoprosthetic reconstructions?
2) What are the functional results of these revision implants?

Methods: This is a retrospective review of our endoprosthesis database consisting of 512 consecutive cemented endoprosthetic reconstructions performed for oncologic diagnoses between 1980 and 2012. 55 of 512 (10.7%) of these were revised for failure. Bushing changes, revisions for adjacent joint pathology and planned expansions of growing implants were excluded. Outcomes followed were prosthesis survival, need for further revision surgery, systemic and local complications and functional outcomes.

Results: Fifty five patients underwent revision of their endoprostheses for aseptic loosening (28), fatigue fracture of implant (15), periprosthetic fracture (3), infection (3), fracture cement (3) and local recurrence (3). Nineteen of 55 patients (34%) required a subsequent revision of their revised cemented implant (mean 5.8 years post-op) for aseptic loosening (7), fatigue fracture (6), infection (5), periprosthetic fracture (1). Seventeen of 19 (89%) were treated with a second endoprosthetic revision, while two had amputations. Five-, 10-, and 15-year Kaplan-Meier implant survival of these revision implants was 81%, 62%, and 54%, respectively. Mean MSTS Score was 26 in this cohort.

Discussion: While cemented endoprosthetic reconstructions are widely accepted for reconstruction of bony deficits after sarcoma resection, the challenge of revision surgery is often cited as a rationale for using alternative techniques. In this cohort, rate of subsequent surgery after revision endoprosthesis reconstruction was significantly higher than the rate after the index surgery (34% vs. 11%). Specifically, infection rates were significantly higher (9%) after revision surgery than after index procedures (1%). While these revision surgeries do carry a higher rate of re-operation, long-term durability was shown and functional outcomes were excellent, suggesting that revising cemented endoprostheses is possible and often achieves good results.

Kaplan-Meier Prosthetic Survival Estimate

