Abstract 10603

Title: Arthroplasty for the Treatment of Pathologic Fracture in the Setting of Metastatic Disease of the Proximal Femur

Authors: Matthew Houdek, Benjamin Wilke, Cody Wyles, Peter Rose, Michael Taunton, Franklin Sim

Institution: Department of Orthopedic Surgery, Mayo Clinic, Rochester, MN

Background: The proximal femur is one of the most common locations to be involved with metastatic bone disease and subsequent pathologic fracture. In the hip it is important to provide patients with a reconstruction that provides the patient with immediate weight bearing while being durable enough to outlast the life expectancy of the patient. Currently a main treatment option for pathologic fracture in the setting of metastatic disease is bipolar or total hip arthroplasty (THA). Although these implants are commonly used, there remains a paucity of data concerning the outcome and complications of these reconstructions.

Purpose: The purpose of this study was to examine a consecutive series of hip arthroplasty (bipolar or THA) performed for a pathologic fracture due to metastatic disease of the proximal femur to evaluate 1) overall patient and implant survival, 2) need for reoperation, and 3) postoperative complications including infection and dislocation.

Methods: Using our institutions total joint registry we identified 395 patients who underwent an arthroplasty procedure to treat a pathologic fracture in the setting of metastatic disease to the femur from 1969-2013. Kaplan-Meier survival outcomes and Hazard ratios were assessed for overall survival, reoperation, infection, and revision. Mean age was 62 yrs (range 12-93 yrs) at the time of the surgery with 59% being female. 21% of patients were classified as obese. All surviving patients had 1-year follow-up with a mean follow-up of 3 yrs (1-14 yrs). The mean time to death was 1 year (range 1 day-24 yrs). An endoprosthesis or custom prosthesis was used in 21% and 9% of patients. A bipolar component was used in 85% of patients. Harris Hip (HHS) and Musculoskeletal Tumor Society (MSTS) Score were calculated at the patients' most recent follow-up.

Results: The mean 2-, 5- and 10-year overall survival was 22%, 5%, and 1% (Fig. 1). In regards to survival of the implant, the 2-, 5- and 10-year overall survival was 97%, 84% and 77% (Fig. 1). The mean time to revision THA, reoperation for any cause, and postoperative infection was 18 mo, 12 mo and 8 mo. Hazard ratios showed an increased risk for revision, reoperating and infection in with postoperative complications including dislocation, hematoma and delayed wound healing (Table 1). No analyzed preoperative factor was found to increase the risk of revision, reoperation and infection. There was no increased risk of revision based on the type of implant used. Postoperative complications included periprosthetic fracture (n=14, 3.5%), dislocation (n=13, 3.3%), DVT/PE (n=7, 1.8%), delayed healing (n=5, 1.2%), infection (n=5, 1.2%) and hematoma (n=3, 0.7%). There was a significantly increased risk of dislocation based on type component (THA v. bipolar, OR 6.18, *P*=0.001). Following surgery the mean HSS and MSTS score were 74 (range 42-95) and 19 (range 6-29).

Discussion: Although patients typically succumb to their disease prior to implant failure, we believe an arthroplasty procedure of the hip to treat metastatic disease provides a durable reconstructive option. It provides patient with pain relief and an acceptable functional recovery. Those with a postoperative wound complication are at increased risk of revision, reoperation and infection. Although patients undergoing a THA were at increased for dislocation, we believe it is an acceptable treatment option in the setting of preexisting osteoarthritis.

Table 1: Hazard Ratios for Rerevision, Reoperation and Postoperative Infection for Arthroplasty Reconstruction of a Pathologic Fracture in the Setting of Metastatic Disease to the Proximal Femur

Preoperative Factors	Revision THA (95% CI)	*p Value*	Reoperation (95% CI)	*p* Value	Infection (95% CI)	*p* Value
Obesity	2.16 (0.67-6.92)	0.18	1.77 (0.63-4.76)	0.26	2.03 (0.24-17.03)	0.48
Male Gender	1.70 (0.58-5.23)	0.32	1.50 (0.63-3.62)	0.35	2.34 (0.38-17.86)	0.34
Age ≤50	2.23 (0.61-6.75)	0.20	2.25 (0.79-5.62)	0.11	3.77 (0.49-23.07)	0.17
Total Hip	1.69 (0.38-5.47)	0.44	2.03 (0.65-5.31)	0.20	1.35 (0.06-9.17)	0.79
Endoprosthesis	1.40 (0.38-4.22)	0.57	1.39 (0.49-3.44)	0.50	1.02 (0.05-6.99)	0.97
Custom Implant	1.37 (0.21-5.14)	0.68	2.79 (0.78-7.41)	0.10	2.57 (0.13-17.49)	0.44
Post-Operative Complications						
Dislocation	**8.38 (2.19-26.43)**	**0.003**	**42.93 (15.31-123.28)**	**<0.0001**	-	-
Hematoma	8.75 (0.47-47.34)	0.11	**71.51 (15.13-265.08)**	**<0.0001**	**25.03 (1.27-171.21)**	**0.03**
Delayed Healing	**29.07 (4.25-126.42)**	**0.002**	**25.12 (5.69-79.76)**	**0.0003**	**178.56 (17.02-3850.9)**	**0.0002**
Periprosthetic Fracture	**4.88 (1.08-16.14)**	**0.04**	**4.64 (1.31-12.88)**	**0.02**	4.75 (0.24-33.73)	0.24
Infection	**80.16 (22.27-288.53)**	**<0.0001**	**36.10 (11.46-97.59)**	**<0.0001**	-	-

Abstract 10603

Figure 1:

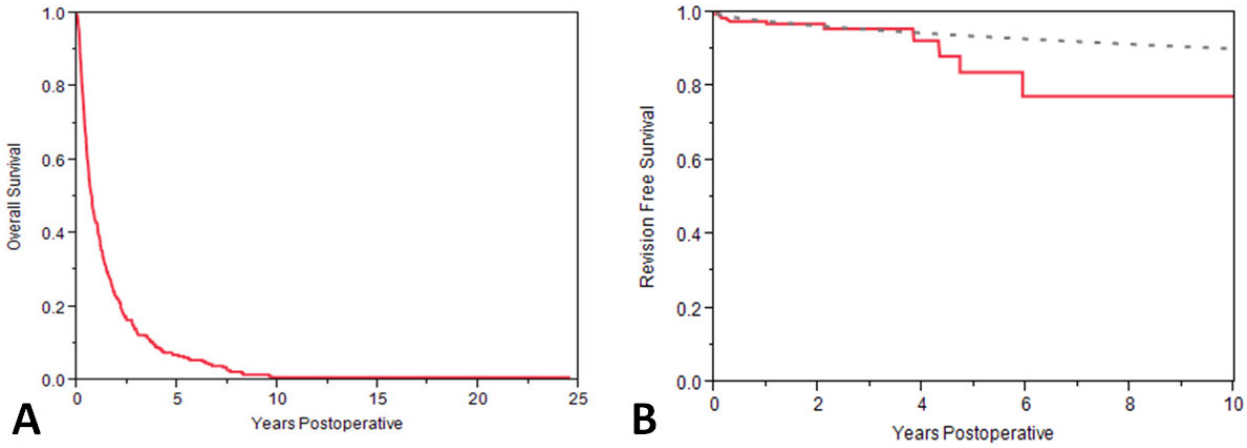

Figure 1: Overall- (A) and revision-free survival (B) with competing cause for death (dash) following arthroplasty reconstruction for a pathologic fracture in the setting of metastatic disease to the femur. Patients frequently succumb to their disease prior to needing a revision procedure.