Improved Functional Status in Patients Undergoing Cement and Rebar Reconstruction with Total Hip Arthroplasty for Uncontained Metastatic Tumors of the Acetabulum

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INTRODUCTION

The pelvis is the second most common site of bony metastasis behind the spine. Metastatic cancer of the acetabulum can produce marked pain and disability for patients. This can lead to significant difficulty with activities of daily living, ambulation, and a reduced quality of life. Large uncontained acetabular defects are challenging to reconstruct, and techniques vary widely. Acetabular fractures in this setting are difficult to fix due to deficient bone. We aim to assess if cement and rebar reconstruction using posterior column screws and total hip arthroplasty can improve ambulation and functional status in these patients.

METHODS

Operative logs within a United States integrated healthcare network were reviewed for patients who underwent pelvic reconstruction for metastatic disease between 2014 and 2017. Twenty-two patients who underwent reconstruction with total hip arthroplasty for peri-acetabular metastases were identified (Figure 1). All cases had Harrington class III (massive, uncontained) acetabular defects with significant disability. A posterolateral approach was utilized for all cases. The tumor and any unstable bone were debulked. A standardized technique of three to four (4.5mm or 6.5mm) posterior column screws placed from within the defect towards the posterior ilium (PSIS). The pelvic defect was filled with cement and a cup was cemented in place resting on the screw heads (Figure 2). Changing the depth of the screws allowed for the position of the cup to be adjusted. A constrained liner or dual mobility construct was used for all but one case. All patients were allowed to bear weight as tolerated after surgery. All cases were reviewed for patient demographics, surgical parameters, implant survival, complications, and functional status following these procedures. Statistical analysis was done using Chi-square analysis with statistical significance < 0.05.

Figure 1: Pre-Operative Radiographs Demonstrating Metastatic Renal Cell Carcinoma (RCC) of the Acetabulum

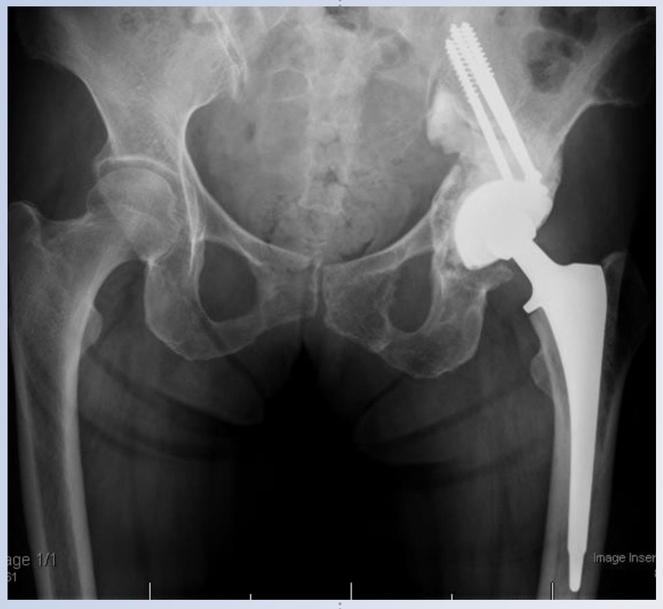

Figure 2: Cement Rebar Construct Used for Reconstruction of Harrington Type III Acetabular Defect Secondary to RCC

RESULTS

The average age of the patients was 65.3 years and 64% of patients were male. Average follow-up was 417 days (range 51-1220 days). Average estimated blood loss (EBL) was 689 mL. There were no intra-operative complications. Average hospital stay was 5.3 days (range 3-12 days). There was a significant increase in ability to ambulate post-surgery (95.5%) compared to pre-surgery (27.3%) ($p<.001$). 81% required an ambulatory assistive device post-operatively. The one patient who was unable to mobilize post-operatively had severe renal disease secondary to renal cell carcinoma and passed away 2 months after surgery. Three patients had complications (14%), two of whom required revision (9%). There was one post-operative infection that was treated with incision and drainage with implant retention. Two patients had post-operative dislocations. One patient had construct migration that did not require operative intervention. 77% of patients were deceased at final follow up with the implant lasting the lifetime of the patient in all cases.

CONCLUSIONS

Peri-acetabular metastases often leads to significant disability and reduced quality of life. Reconstruction often difficult and techniques vary widely. We review a standardized technique of posterior column screws as rebar for a cemented total hip arthroplasty. Patients undergoing this type of reconstruction showed improved mobility and function.

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