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Novel Acetabular Hemiarthroplasty for Palliation of Periacetabular Metastatic Disease with Articular Bone Loss

Abstract

Introduction: Periacetabular metastatic disease is often successfully treated nonoperatively. Cases with extensive bone loss and subchondral collapse of the acetabular dome require reconstruction to restore mobility. These procedures are associated with significant morbidity and postoperative complications.

Objectives: The primary objective of this case study is to describe a novel "acetabular hemiarthroplasty" to manage periacetabular metastatic disease with subchondral collapse and protrusio.

Methods: Five consecutive patients with significant periacetabular bone loss and subchondral collapse were surgically managed with a novel acetabular hemiarthroplasty. The hospital records were retrospectively reviewed and outcomes at most recent follow up are reported. Results: Our findings suggest that acetabular hemiarthroplasty could be a valuable option for surgical palliation of periacetabular metastatic disease involving subchondral collapse and protrusio.

Conclusion: This technique provides for restoration of joint mechanics and weight bearing without the need for total hip arthroplasty. Compared to complex hip arthroplasty, we believe this novel acetabular hemiarthroplasty potentially reduces operative time and blood loss, while substantially limiting the risk of dislocation.

Supplementary Data

Figures



Figure 1. Case 1- periacetabular thyroid cancer metastasis. (a) AP pelvis radiograph demonstrating cephalad migration of the femoral head, (b) CT with sagittal reconstruction showing involvement of superior dome and posterior column.



Figure 2. Total hip polyethylene acetabular liner portion used to restore missing articular surface. Approximately 2/3 of the liner is discarded.



Figure 3. Case 1 postoperative AP radiograph of the pelvis demonstrating cemented polyethylene liner portion within the acetabulum. Despite the mild persistent superior hip joint subluxation, the patient reports minimal pain.



Figure 4. Case 2 - periacetabular metastatic endometrial cancer. (a) CT axial and (b) 3D reconstruction views demonstrating destruction of medial acetabular wall and anterior column.



Figure 5. Case 2 intraoperative images. (a) Fluoroscopy of tumor curettage and (b) photograph of completed reconstruction showing thick liner protruding beyond the medial wall.

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Figure 6. Case 2 postoperative CT imaging (a) Coronal and (b) 3d reconstruction views demonstrating radiolucent acetabular liner portion, methyl methacrylate and Steinman pin and (c) radiograph at 21 months largely unchanged with pin removed, restored anterior column bone and mild degenerative changes of the femoral head.

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Figure 7. Case 5 - metastatic head and neck cancer. Preoperative CT (a) coronal reconstruction and (b) 3d reconstruction demonstrating loss of medial wall and portion anterior acetabulum column. (c) Postoperative pelvis radiograph showing cemented polyethylene acetabular liner portion.