

Clinical Communications: Adults

CLOSED REDUCTION OF CONSTRAINED TOTAL HIP ARTHROPLASTY IN THE ED

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□ **Abstract**—A dislocated hip prosthesis is a common occurrence in the Emergency Department. To combat this problem, orthopedists use constraint devices in an attempt to reduce the incidence of dislocation. However, when these devices fail, a more complicated case arises. We discuss a case report in which a patient presented with a dislocation of his hip after implantation of a constrained total hip arthroplasty. We describe a closed reduction procedure using deep sedation, fluoroscopy, and adequate assistance. © 2011 Elsevier Inc.

□ **Keywords**—hip; constraint; dislocation; reduction; closed

wah, NJ) and the S-ROM (Joint Medical Products Corp., Stamford, CT) constrained liner are the two most commonly described in orthopedic literature (2,3,6). These devices, through similar techniques, lock the femoral head in the acetabular component of the prosthesis by adding reinforced material around the rim of the acetabulum. In one study that included 55 hips in 51 patients, 9 hips with constraint devices (16%) sustained dislocation postoperatively at a mean of 19 months (6). Recent orthopedic literature recommends an attempt at closed reduction, and the procedural details are presented in the Discussion section (2,7).

INTRODUCTION

Dislocation of the hip after total hip arthroplasty (THA) is common, occurring in 0.3% to 10% of primary THA patients and up to 26.6% of patients who have undergone revision THA (1–4). Current literature indicates that an attempt at closed reduction in the Emergency Department (ED) is indicated, and can usually be achieved with a relatively high success rate (1,5). Germann et al. reported a 91% successful reduction rate when reduction is attempted by the emergency physician or by the emergency physician and orthopedist (1). If instability after primary or revision total hip arthroplasty becomes a problem, or if postoperative dislocation is a concern when performing THA, the orthopedist may choose to use a constrained acetabular liner (Figure 1). The Howmedica-Osteonics constrained liner (Stryker Orthopaedics, Mah-

CASE REPORT

A 73-year-old man presented to the ED with complaints of left hip dislocation. He stated he was sitting in a recliner and leaned forward and twisted to the left when he felt a pop in the left hip. He denied pain but was unable to bear weight on the leg. He arrived in the ED via Emergency Medical Services. Distal neurovascular status was intact, and he had good capillary refill in the left lower extremity. The left leg was observed to be shortened and internally rotated. He had a history of frequent dislocations after bilateral hip arthroplasty. The left THA was revised 2 years earlier to include a constrained acetabular liner. Radiographic images of the left hemipelvis revealed a superior dislocation of the femoral head portion of his total hip prosthesis. There was no evidence of

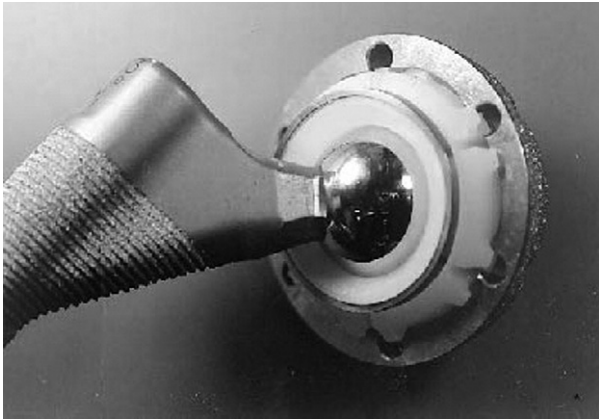


Figure 1. Constrained acetabular device pictured ex vitro. From: Harman MK et al. Closed reduction of constrained total hip arthroplasty. *Clin Orthop Relat Res* 2003;(414):121–8 (7). Reprinted with permission.

fracture, and the constrictor ring was visualized lateral to the rim of the acetabulum (Figure 2).

Initial reduction attempt was performed under procedural sedation with etomidate (20 mg i.v.). After sedation was achieved, the emergency physician attempted reduction using the Allis maneuver, in which the patient's hip

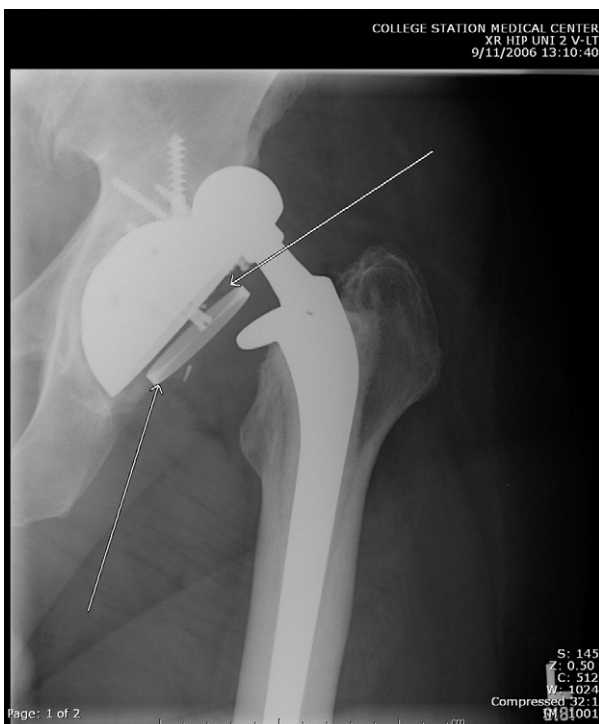


Figure 2. Anteroposterior view of left hip shows superior dislocation of the femoral head. The radiolucent polyethylene liner, not visible on plain films, normally accepts the femoral head. The metal ring seen lateral to the acetabular component then locks the liner around the femoral component.

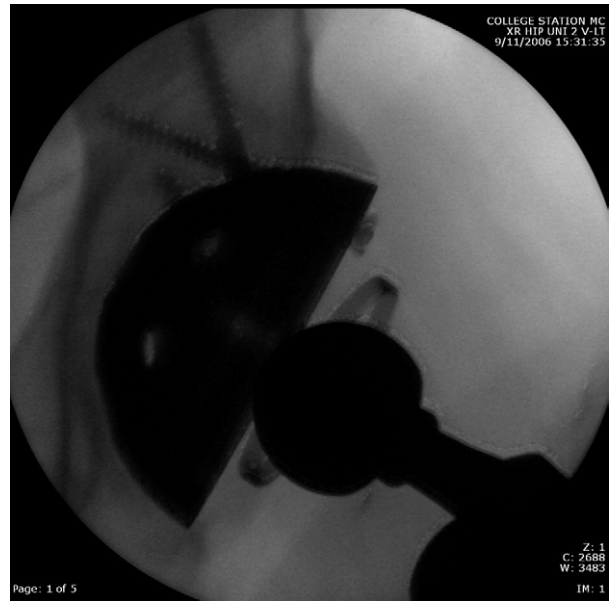


Figure 3. Fluoroscopic image showing the femoral head poised at the opening of the acetabulum.

and knee are flexed to 90 degrees and the physician applies external and internal rotation of the hip while pulling upward on the femur (8). It was initially thought that reduction was successful; a pop was felt upon reduction and the leg appeared lengthened. However, post-reduction films showed the hip had become superiorly dislocated once again.

At this point, the consulting orthopedic surgeon was contacted. The case was discussed and it was determined that the acetabular liner likely made the initial reduction attempt unsuccessful. The orthopedist stated that a dislocation of this type of prosthesis requires open reduction that needed to be done by the doctor who performed the arthroplasty. Unfortunately, the patient had just moved to the area and initial attempts to contact the patient's out-of-town orthopedist were unsuccessful.

The emergency physician then decided to attempt reduction again under procedural sedation using fluoroscopy. The patient was pre-medicated with lorazepam (Ativan, Baxter Healthcare Corp., Deerfield, IL) 2 mg i.v. and then given etomidate 20 mg i.v. After adequate sedation was obtained, the hip was adducted 10 degrees, the knee was flexed, and traction was applied. The femoral head was manipulated to sit lateral to the rim of the acetabular prosthesis. This was confirmed by anteroposterior and lateral fluoroscopic imaging (Figure 3). The hip was then abducted 30 degrees and pressure was applied over the greater trochanter by multiple assistants. An audible click was noted and radiographic images confirmed that the femoral head component had passed through the constrainer ring located lateral to the acetab-

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