Obturator Dislocation of Total Hip Arthroplasty
A Case Report

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Abstract

This study consists of a single case report of a patient who had an irreducible obturator dislocation of a total hip arthroplasty after a motor vehicle accident, not previously described in the English literature. In particular, the focus will be on offering an educated opinion on the risk factors for dislocation and difficulties encountered with this type of dislocation. The aim is to offer valuable insight based on the operative experience with this patient and to supplement the literature with the management of such a complication following total hip arthroplasty.

A 29-year-old male was involved in a motor vehicle accident (MVA) and was taken to the emergency room of another institution, where he was trauma cleared and diagnosed with a dislocation of a right total hip arthroplasty (THA), seen on radiographic examination. Closed reduction was attempted in the emergency room, with pain control and light sedation, but the procedure was unsuccessful. He was then taken to the operating room of the same hospital for another attempt at closed reduction, which was also unsuccessful. At this point, the patient was transferred to our institution.

His past history was significant for a prior vehicular accident, followed by minor hip pain, but no diagnosis of a bone injury. He subsequently developed severe hip pain and was diagnosed with osteonecrosis of the right femoral head, with secondary osteoarthritis. After a period of unsuccessful nonoperative therapy, the patient received a ceramic-on-ceramic, cementless right THA.

One year later, the current MVA occurred, with dislocation of the right THA, for which we assumed care of the patient. At the time of this last accident, the patient reported being a passenger unrestrained by a seatbelt and sitting in the back seat. During the MVA, he was flung forward, with his right knee and inner thigh striking the front seat. The patient did not sustain head trauma, and injury was isolated to the right lower extremity. On physical reexamination at our institution, he had minor skin abrasions and no neurological deficits; however, he was in distress with his right lower extremity held with the hip flexed to 70°, abducted 30°, and externally rotated. In addition, he had extreme pain on gentle hip motion. Plain radiographs were taken, and the patient was confirmed to have a greater trochanteric fracture and a right THA dislocation, with the femoral head lodged in the obturator foramen (Figs. 1 and 2).

The patient, subsequently, was brought to the operating room and general anesthesia was administered. After several minutes of muscle relaxation, closed reduction was again attempted, unsuccessfully. The patient was then prepped and draped in the lateral position. An incision was made posteriorly, and a large hematoma was evacuated from deep to the fascia. The fracture of the greater trochanter was identified, and the femoral head was visualized. The head was seated in the obturator foramen, abutting the membrane. The piriformis was dissected off of the greater trochanter, and a bone hook was placed around the prosthetic femoral neck. The bone hook was used to apply lateral traction, while an
assistant pulled on the leg to generate longitudinal traction. The prosthesis was disengaged from the obturator foramen and reduced. There was no damage to the femoral head or the acetabular component. The trochanter was then reduced and secured with a Dall-Miles cable and sleeve, and the piriformis was reattached (Fig. 3).

The patient had an uncomplicated postoperative course, progressed rapidly with physical therapy, and was discharged home on the third postoperative day. On six-month follow-up, the fracture of the greater trochanter had healed, and the patient was ambulating unassisted and pain free.

**Discussion**

Levering of the femoral component out of the acetabulum caused this traumatic dislocation. At the time of dislocation, the right femur was held abducted and fixed, as the patient’s body was propelled forward. MVAs involving unrestrained passengers have been reported as the most common cause of native hip dislocations, accounting for 62% to 93% of dislocations in various studies, although most of these are posterior dislocations and from dashboard injuries.

The success rate of closed reduction of THA dislocation has been shown to be between 94% and 97%.

No specific data is available on the success of closed reduction after an obturator dislocation, although it is likely lower due to the muscle forces generated in this type of dislocation. In most THA dislocations, the head rests proximal to the acetabulum, placing the muscles in a shortened position. In an obturator dislocation, the head is distal to the acetabulum, causing the muscles to be lengthened. This longer difference in length increases the difficulty of reducing a dislocated hip, due to the length-tension relationship of muscle. Maximal force generation of a muscle is produced at its resting length, when the maximal number of actin-myosin cross bridges are formed. When a muscle is shortened to less than the resting length, the increased actin-myosin overlap
decreases the number of cross bridges, hence, diminishing the force that can be generated. The contractile force of a lengthened muscle is also decreased compared to the resting length. However, due to the noncontractile force generated by lengthening the connective tissue, the overall force is increased. This increased force was a confounding factor in our (and presumably the prior institute’s) inability to perform a closed reduction.

Several closed reduction maneuvers for this type of dislocation have been described for native hips, such as traction in the line of the femur with the hip flexed, followed by either further abduction and gentle internal rotation or by slowly adducting the hip as longitudinal traction is released. When any of these techniques are applied to a prosthetic hip replacement, they should be performed gently, as there is a risk of disengaging the femoral head from the trunnion. If these maneuvers prove unsuccessful, as in our case, open reduction with the assistance of a bone hook should be performed, as the prosthetic femoral head may be physically lodged in the obturator foramen.

Disclosure Statement
None of the authors have a financial or proprietary interest in the subject matter or materials discussed, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.

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