

Case Report

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Closed reduction of posterior hip dislocation with ipsilateral femoral shaft fracture: A case report

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Abstract

Introduction: Posterior hip dislocation with ipsilateral femoral shaft fracture is a unique injury pattern that has been reported in the orthopedic literature recently. Manual closed reduction of the posterior hip dislocation is exceedingly difficult due to the inability to gain adequate traction of the distal femur fragment. Therefore, the hip dislocation is most often managed in the operative setting.

Case presentation: We report the case of a 21 year old female at 32 weeks gestation with a traumatic posterior hip dislocation and ipsilateral femoral shaft fracture. Manual closed reduction of the hip was successfully performed in the emergency department and the femoral shaft fracture was managed with retrograde intramedullary nailing.

Conclusion: With the goal of decreasing the risk of avascular necrosis and limiting general anesthetic requirements, this case serves as a testament to the value and efficacy of attempting closed hip reduction maneuvers despite ipsilateral femoral shaft fractures.

Introduction

The combination of hip dislocation and ipsilateral femoral shaft fracture is a rare injury pattern with an estimated incidence of 1 in 100,000 [1]. Although it is widely known that hip dislocations should be managed expeditiously to avoid avascular necrosis of the femoral head, multiple distracting injuries or medical comorbidities may lead to delays in care. In the presence of an associated ipsilateral femoral shaft fracture, closed reduction may prove challenging. We report the case of a 21-year-old pregnant female at 32 weeks gestation who sustained a right posterior hip dislocation and ipsilateral femoral shaft fracture. This was successfully treated with closed reduction under IV sedation in the emergency department prior to surgical fixation. The patient was informed that data concerning the case would be submitted for publication, and she provided consent.

Case presentation

A 21-year-old pregnant female at 32 weeks gestation was brought to a Level 1 Trauma Center by Emergency Medical Services following a head-on motor vehicle collision (MVC) in which she was an unrestrained passenger. The patient was hemodynamically stable on initial trauma assessment with a Glasgow Coma Score of 15 and reassuring fetal heart tones. Physical examination revealed a neurovascularly intact right lower extremity with shortening and internal rotation along with diffuse pain. Radiographic imaging demonstrated a right posterior hip dislocation and displaced transverse fracture of the femoral diaphysis (Figures 1a and 1b). Other orthopaedic injuries included second, third, and fourth metatarsal fractures of the right foot. Under conscious sedation in the emergency department, closed reduction of the hip was successfully performed through a combination of both the Allis and Bigelow maneuvers while the patient was positioned on her left side

(Figure 2). More specifically, the affected hip was flexed while maintaining inline traction, aided by counter traction applied to bilateral anterior superior iliac spines. Then, direct pressure was applied to the greater trochanter to reduce the femoral head into the acetabulum. After reduction was confirmed radiographically, the patient was placed in balanced skeletal traction and later taken to the operating room following clearance from Obstetrics and Gynecology.

The patient was positioned supine on the operative table with a bump under her right hip to decompress the inferior vena cava and a led apron over her pelvis. First, the mid shaft femur fracture was addressed via retrograde intramedullary nailing using a transtendinous approach. Intraoperative fluoroscopy confirmed adequate reduction and restoration of femoral length, alignment, and rotation. Two distal interlocking screws were placed and one proximal screw was inserted using the perfect circle technique (Figure 3a). The metatarsal fractures were then addressed. Using K-wire fixation, the third and fourth metatarsals were reduced which led to spontaneous reduction of the second metatarsal fracture (Figure 4). Final fluoroscopic images were negative for femoral neck fracture (Figure 3b).

At the two month postoperative visit, the patient was weight bearing as tolerated and ambulating well without immobilization, reporting minimal right leg and foot discomfort. Her pregnancy was carried to 36 weeks and standard vaginal delivery occurred without complication. At this time, radiographs confirmed appropriate osseous healing without evidence of fixation failure or femoral head necrosis (Figure 5).

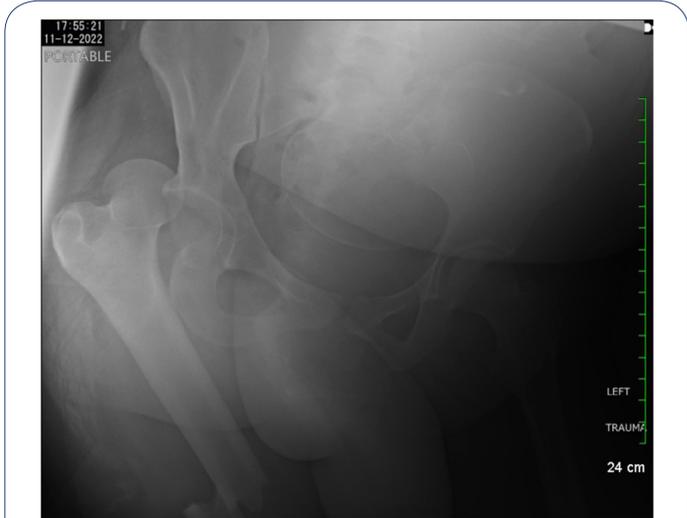


Figure 1b: One view pelvis X-ray displaying posterior hip dislocation.

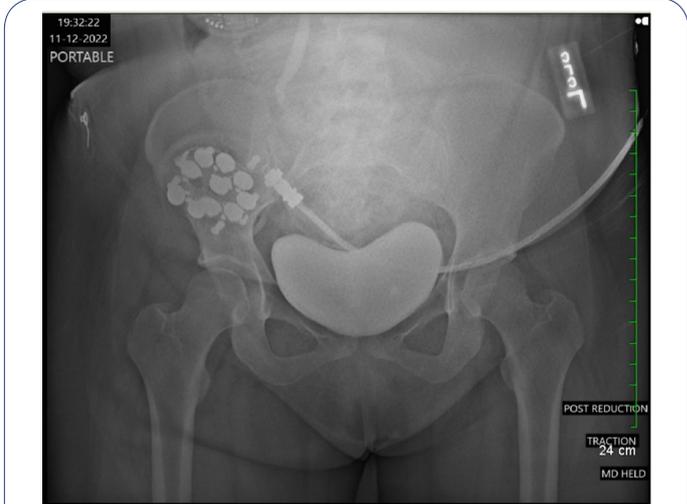


Figure 2: One view pelvis X-ray post reduction displaying adequate reduction.



Figure 1a: One view right femur X-Ray displaying femur fracture.

Figure 3a: Intra-operative plain film displaying intra-medullary rod in place with distal locking screws.

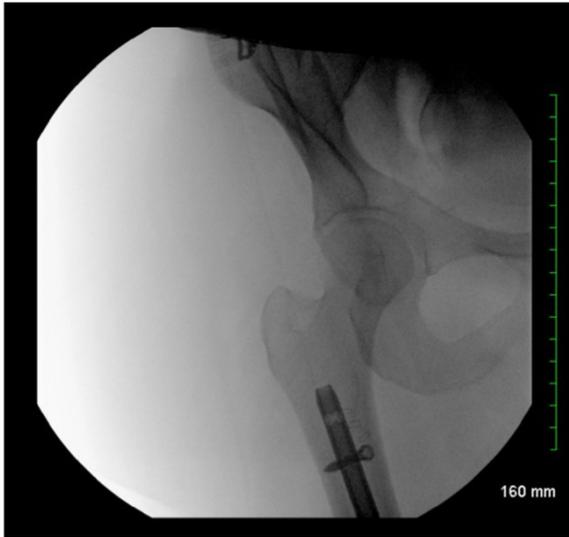


Figure 3b: Final intra-operative films displaying no femoral neck fracture.



Figure 4: Intra-operative films demonstrating proper reduction of third, fourth, and fifth metatarsals.



Figure 5: Two months post-operative one view pelvis X-ray demonstrating in place acetabular head.

Discussion

Traumatic dislocation of the hip with associated ipsilateral femoral shaft fracture is an uncommon injury pattern. A 1948 review article estimates the incidence of this dual injury as 1 in 100,000 [1]. The first reported case was in 1824, and by 1977, only 98 cases had been cited in the literature [2,3]. Recently, however, there has been an increasing number of published case reports describing this injury combination [4,9]. Prior studies have reported that, when present with a known femoral shaft fracture, the initial diagnosis of a hip dislocation is missed in approximately 50% of cases. This can be a costly oversight, since optimal management of hip dislocation requires reduction within 6 hours of diagnosis to avoid avascular necrosis of the femoral head and further chondral damage with need for subsequent total hip arthroplasty [10-13]. Missed diagnosis of hip dislocation can partially be attributed to the mechanism of injury commonly associated with this injury pattern. Hip dislocation and ipsilateral femur fracture have been shown to occur as the result of two distinct forces: an axial load on the flexed hip which dislocates the femoral head posteriorly, and a separate lateral force which fractures the femoral shaft [11]. These forces are commonly seen in high-energy MVC's, which are likely to have other, non-orthopaedic, distracting injuries. The characteristic positioning of patients with hip dislocations, namely hip adduction, flexion, and internal rotation, may be masked in the presence of ipsilateral femoral shaft fractures. This is thought to be due to the femoral shaft fracture acting as a corrective osteotomy and therefore altering patient positioning [11]. Additional factors may have placed this patient at an elevated risk for delayed diagnosis of a hip dislocation, including her pregnancy status and attention towards the health of the fetus. Furthermore, efforts to adequately resuscitate both the patient and fetus may have delayed operative clearance and prolonged the time to surgery. This highlights the importance of timely closed reduction in the emergency department to decrease the risk of avascular necrosis.

In the setting of an ipsilateral femoral shaft fracture, achieving adequate in-line traction is inherently more difficult [14-16]. Due to this, most hip dislocations with ipsilateral femoral shaft fractures are initially managed operatively using bone clamps, Steinmann pins, or External Fixators [4,5,17]. Given the known risks of additional anesthesia to the fetus such as pre-term labor and low birth weight, every effort was made to achieve a closed reduction of the hip dislocation while in the Emergency Department [18,19].

Conclusion/clinical message

This case demonstrates the importance of a thorough musculoskeletal exam in high-energy trauma patients in order quickly and accurately identify injuries that may require immediate management such as a hip dislocation. This case also serves as a testament to the value and efficacy of attempting closed hip reduction maneuvers despite ipsilateral femoral shaft fractures, with the goal of decreasing the risk of avascular necrosis and limiting general anesthetic requirements.

Declarations

Consent: The patient was informed that data concerning the case would be submitted for publication, and she provided consent.

Competing interests: The authors declare that they have no competing interests.

Author's contributions: HK performed the literature review, manuscript writing, manuscript editing, and manuscript submission. DL performed literature review and manuscript editing. MZ performed literature review and manuscript editing. SK performed manuscript editing. RL performed manuscript editing and functioned as the senior advisor.

References

1. Wilteberger BR, Mitchell CL, Hedrick DW. Fracture of the Femoral Shaft Complicated by Hip Dislocation. *J Bone Joint Surg Am.* 1948; 30(1): 225-228.
2. Cooper, Astley BART, FRS. S to the K. A Treatise on Dislocations and on Fractures of the Joints: Fractures of the Neck of the Thigh-bone. *Med Sci Anal Ser.* 1822; 3(11).
3. Ehtisham SM. Traumatic Dislocation of Hip Joint with Fracture of Shaft of Femur on the Same Side. *J Trauma.* 1976; 16(3): 196-205.
4. Alhammoud A, Alnouri M, Arbash MA, Baco AM. Posterior Hip Dislocation with Ipsilateral Femoral Head and Shaft Fracture - Using a Temporary External Fixator as a Method for Closed Reduction. *J Orthop case reports.* 2016; 6(5): 44-46. doi:10.13107/jocr.2250-0685.624.
5. Iftekhar N, Rasool T, Zhitny VP, Rasool S. Ipsilateral Posterior Hip Dislocation and Femur Shaft Fracture - A Rare Presentation. *J Orthop case reports.* 2020; 10(7): 3-5. doi:10.13107/jocr.2020.v10.i07.1892.
6. Rana R, Patra SK, Khuntia S, Jain M, Patro BP. Traumatic Posterior Dislocation of Hip with Ipsilateral Fracture of Shaft of Femur: Temporary Fixator-assisted Reduction and Final Fixation with Interlocking Nail. *Cureus.* 2019; 11(8). doi:10.7759/cureus.5488.
7. Kassou N, Naam A, El Alami B, et al. Traumatic Dislocation of the Hip Associated To Ipsilateral Femoral Shaft Fracture in a Racing Driver. *IOSR J Dent Med Sci e-ISSN.* 2017; 16(5): 81-84. doi:10.9790/0853-1605078184.
8. Sidibe M, Bah ML, Sylla FM, Camara M, Soumah A, Ntungwanayo S. Traumatic posterior dislocation of hip with ipsilateral fracture of shaft of the femur: external maneuvers reduction and osteosynthesis by screw plate about a case and review of literature at Tambacounda regional hospital in Senegal. *Int J Res Orthop.* 2022; 8(5): 602. doi:10.18203/issn.2455-4510.intjresorthop20222193.
9. Galois L, Pfeffer F, Kermarrec I, Traversari R, Mainard D, Delagoutte JP. Posterior dislocation of the hip with concomitant ipsilateral fractures of both the femoral head and shaft: A case report. *Eur J Orthop Surg Traumatol.* 2001; 11(2): 129-131. doi:10.1007/BF01682494.
10. Dawson-Amoah K, Raszewski J, Duplantier N, Waddell BS. Dislocation of the hip: A review of types, causes, and treatment. *Ochsner J.* 2018; 18(3): 242-252. doi:10.31486/toj.17.0079.
11. Helal B, Skevis X. Unrecognised dislocation of the Hip in Fractures of the Femoral Shaft. *J Bone Jt Surg.* 1967; 49(2): 293-300.
12. Henry A, Bayumi MR. Fracture of the Femur with Luxation of the Ipsilateral Hip. *Br J Surg.* 1934; 22.
13. Dehne E, Immerman E. Dislocation of the Hip Combined with Fracture of the Shaft of the Femur on the Same Side. *J Bone Jt Surg - Am Vol.* 1951; 33(3): 731-745.
14. Gazzotti G, Patrizio L, Dall'Aglio S, Sabetta E. Low-Energy Traumatic Obturator Hip Dislocation with Ipsilateral Femoral Shaft Fracture in a Patient with Omolateral Knee Arthroplasty. *Case Rep Orthop.* 2016; 2016(c): 1-5. doi:10.1155/2016/8754893
15. Verdonk R, De Smet L. Hip dislocation combined with femoral shaft fracture: Two cases treated with the Iardenois hoop. *Acta Orthop.* 1984; 55(2): 185-186. doi:10.3109/17453678408992334
16. Slater RNS, Allen PR. Traumatic Hip Dislocation with Ipsilateral Femoral Shaft Fracture in a Child: an "open and closed" case. *Int J Care Inj.* 1992; 23(1): 60-61.
17. Harper M. Traumatic Dislocation of the Hip with Ipsilateral Femoral Shaft Fracture: a Method of Treatment. *Injury.* 1982; 13(5): 391-394.
18. Devroe S, Bleeser T, Van De Velde M, et al. Anesthesia for Non-Obstetric Surgery During Pregnancy in a Tertiary Referral Center: a 16-year retrospective, matched case-control, cohort study. *Int J Obstet Anesth.* 2019; 39: 74-81.
19. Okeagu CN, Anandi P, Gennuso S, et al. Clinical management of the pregnant patient undergoing non-obstetric surgery: Review of guidelines. *Best Pract Res Clin Anaesthesiol.* 2020; 34(2): 269-281. doi:10.1016/j.bpa.2020.04.004.