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Bilateral Traumatic Posterior Hip Dislocation – A Case Report

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Learning Point of the Article:

The diagnosis and emergent management of bilateral posterior hip dislocation to minimize complications

Abstract

Introduction: Although posterior dislocation of the hip is common, bilateral posterior hip dislocation in children is an infrequent presentation. Early diagnosis and treatment are of paramount importance to prevent complications. Here, we report a case of traumatic bilateral posterior hip dislocation following a high-velocity motor vehicle accident.

Case Report: A 13-year-old boy was brought to the emergency department following high-energy trauma due to a motor vehicular accident. He was in considerable pain with both hips in flexion, adduction, and internal rotation. There was a restriction to the range of movement at bilateral hip joints. Clinical and radiological examination revealed a bilateral posterior hip dislocation.

Conclusion: Posterior hip dislocation is the most common type of hip dislocation. However, bilateral posterior hip dislocation is quite rare. This clinical presentation in the pediatric population is rarer still with very little published literature. Diagnosis and emergent treatment of the same is essential to prevent complications.

Keywords: Bilateral posterior hip dislocation, pediatric posterior hip dislocation, avascular necrosis.

Introduction

Traumatic dislocations of the hip are relatively uncommon injuries and are associated with high-energy trauma. They constitute around 5% of all dislocations [1]. Posterior hip dislocation is commonly encountered and constitutes 85–90% of all hip dislocations [2]. Bilateral dislocations of the hip are far rarer with an incidence of only 1.25% [3]. Bilateral hip dislocations have very little published literature, and what little is available is primarily in case reports. Bilateral hip dislocation in children is rarer still.

With its superior anatomical coverage and robust soft-tissue restraints, the hip joint is naturally stable and maintains its center of gravity throughout a broad range of motion [4]. Therefore, to induce hip dislocation, particularly bilateral hip dislocation, extremely high-energy trauma is necessary. Bony injuries are linked to the majority of high-energy injuries. However, due to children's anatomical peculiarities, pure dislocations are encountered without any fractures.

As with any dislocation, prompt diagnosis and emergent reduction are paramount to prevent complications like avascular necrosis (AVN). In this case report, we would like to highlight the rarity of the injury and the importance of early definitive care.

Case Report

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Author's Photo Gallery

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Figure 1: Clinical picture on presentation.

A 13-year-old boy sustained a road traffic accident where the auto rickshaw he was travelling in toppled over and he suffered an injury to both his hips. He was brought to the emergency department of our level 1 trauma center, with complaints of severe pain and deformity of bilateral hips. He was unable to bear weight and had restriction of movement in both hips.

The patient was received in the emergency room, advanced trauma life support protocol was followed and he was resuscitated. He was clinically and hemodynamically stable and had no systemic involvement in the primary survey. Both hips were maintained in flexion, adduction, and internal rotation (Fig. 1) and the range of movement was extremely painful and restricted. There was a palpable mass in the bilateral gluteal regions. There was no associated neurovascular deficit and there were no other injuries. There was no generalized ligamentous laxity that could be a pre-disposing factor for dislocation. A roentgenogram of the pelvis with both hips was performed and it revealed bilateral coxofemoral incongruence with bilateral posterior displacement of the femoral head with no concomitant fractures (Fig. 2).

The child was taken for immediate reduction under sedation within 2 h of the accident. The right hip was reduced first in the

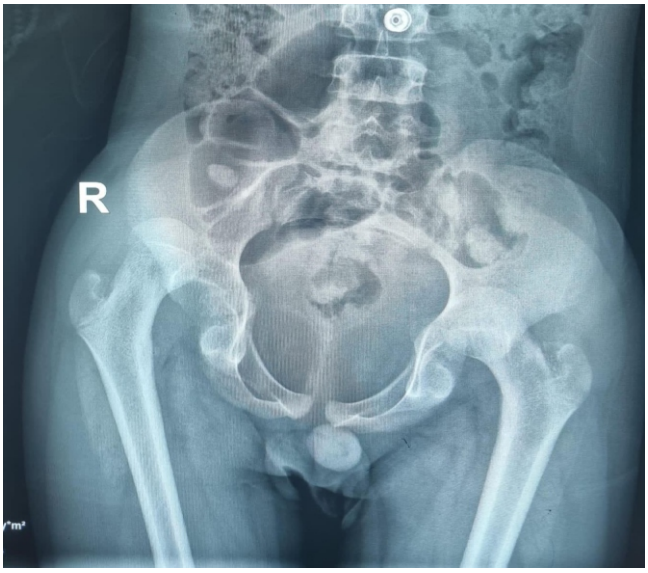

Figure 2: X-ray at presentation.

supine position using Allis' maneuver. The right hip was reduced and was stable on examination. Once the right hip was reduced, the left hip was reduced similarly utilizing the same maneuver (Fig. 3).

Both hips were stable after reduction and there was no restriction of movement on examination and no neurovascular deficit. A post-reduction X-ray was obtained which revealed concentric reduction (Fig. 4). A computed tomography (CT) scan was also performed which confirmed the concentric reduction of both hip joints with no associated osteochondral fracture (Fig. 5 and 6).

The child was advised bed rest for 4 weeks and was put on bilateral below-knee skin traction. He was made to sit and was encouraged to start active knee range of movement exercises, isometric quadriceps strengthening exercises and gluteal muscle strengthening exercises at 4 weeks. Delayed partial weight bearing was started at 6 weeks and progressed to full weight bearing at 8 weeks. He returned to normal activity at 3 months and his return to play was delayed till 6 months.

He was advised close and regular follow-up every 6 months to detect any clinical or radiological evidence of AVN. He was pain-free with a full range of movement in both hips and there were no clinical or radiological signs of AVN or post-traumatic arthritis at 14 months follow-up (Figs. 7 and 8). He was advised to continue regular follow-ups for at least 3 years post-injury to be able to detect late complications.

Discussion

Figure 3: Clinical picture after reduction.

Pure posterior hip dislocations seldom happen when the femur is flexed, adducted, and subjected to axial stress. The likelihood of a fracture affecting the femoral head or the posterior wall of the acetabulum increases with decreased flexion and adduction of the femur during an axial load, as described by Letournel and Judet [4]. Hip dislocations appear to require a greater force as one ages, with high-energy trauma being the most frequent cause of hip dislocations beyond the age of 12 [5]. In young children and adolescents, modest trauma can also occasionally result in momentary hip dislocation, which could involuntarily reduce. Comparable to adult hip dislocation, posterior dislocation accounts for up to 90% of instances reported in the literature, making it the most prevalent pattern in the pediatric population. Given the relative suppleness of their soft tissues and skeletal structures compared to adults, younger children might require less energy than older children to dislocate. Furthermore, compared to adults, the acetabulum is less profound in younger children [6].

According to Pietrafesa and Hoffman, motor vehicle collisions cause 62–93% of hip dislocations [7]. Most traumatic hip dislocations are seen in males as they have an increased predisposition for trauma and there is no observed discrepancy between the right and left side [8]. The relative laxity of soft tissues around the hip in children precludes the possibility of acetabular and femoral head or neck fractures.

The femoral head in children has an evolving pattern of blood supply that changes as the child grows. Retinacular vessels from the lateral and medial circumflex femoral arteries form a metaphyseal ring that supplies the chondro-epiphyseal region. From 4 months to 4 years, as the physis matures, it acts as a barrier to the intraosseous supply and hence, the contribution from the lateral circumflex artery decreases, and the lateral epiphyseal vessels that arise from the medial circumflex femoral artery predominate. By the age of 10, the artery of ligamentum teres develops sufficiently to provide approximately 20% of the blood supply to the femoral head [9].

Damage to the ligamentum teres and capsule occurs when the hip dislocates posteriorly. AVN might ensue from this, compromising the femoral head's blood supply from both the ligamentum teres and the retinacular veins. The risk of AVN depends more on the time to reduction than age or mechanism of injury [10]. Younger children <12 years of age produce Perthes-like changes in the femoral epiphysis while older children show adult patterns of AVN [6].

Typically, a child would present with trauma, and have an inability to walk with the limbs held in an abnormal posture with severe pain and extreme limitation to the range of movement. This is diagnostic of coxofemoral dislocation and requires prompt radiological confirmation and reduction. Pre- and post-reduction radiological investigations and neurological examination are of paramount importance.

An anteroposterior view of the pelvis with both hips is the gold standard view to look for concentric reduction and any side-to-side discrepancy. A joint asymmetry (measured from the lateral edge of the acetabular tear drop to the medial edge of the

Figure 4: Post-reduction X-ray.

Figure 5: Post-reduction computed tomography (axial).

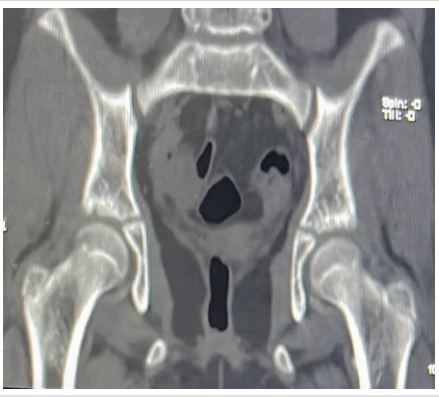

Figure 6: Post-reduction computed tomography (coronal).

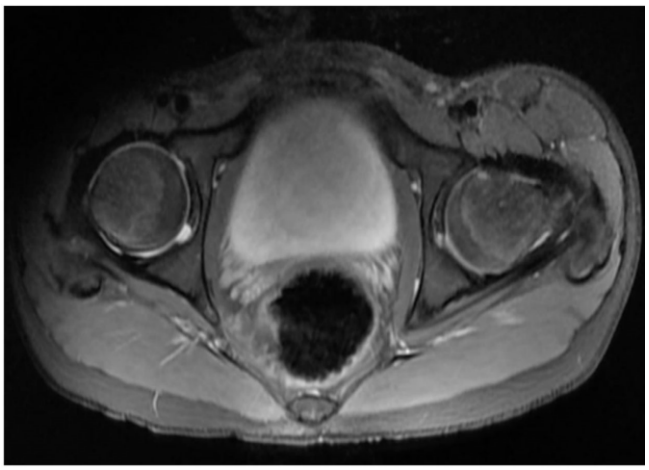

Figure 7: Magnetic resonance imaging at final follow-up (axial).

Figure 8: Magnetic resonance imaging at final follow-up (Coronal).

femoral head ossification center) of 2 mm or more is significant and could be due to hemarthrosis, soft tissue or labral interposition, or concomitant osteochondral fractures [10]. The reason must be ascertained by a magnetic resonance imaging (MRI) or CT scan if any asymmetry is found. Although CT scan has an increased exposure to radiation, the delay and logistical difficulties in obtaining an MRI on an emergency basis obviates the need for one. However, in cases of recurrent dislocation or when the CT reveals no bony abnormality, an MRI scan may be indicated to delineate the exact pathology before planning for surgery.

Immediate reduction is important in traumatic hip dislocation to prevent AVN. According to Hougaard and Thomsen, the incidence of AVN was 4.8% if the hip reduction occurred in <6 h and 58.8% if it was reduced more than 6 h and can present as post-traumatic arthritis till 4 years after reduction [11]. Kellam and Ostrum observed osteonecrosis rates of up to 43% and post-traumatic arthritis rates of 58% related to high-energy posterior hip dislocations [12]. Kellam and Ostrum showed that sciatic nerve injury was noticed in 19% of patients and stressed the importance of a thorough pre and post-reduction neurological examination [12]. Mehlman et al. reported a 20-fold increase in the rate of AVN if reduction was delayed more than 6 h [10].

In his case series, Glass and Powell noticed a 13% incidence of coxa magna following dislocation which he attributed to hyperemia post-trauma and synovitis [13]. Ahmadi and Harkess described and classified recurrent hip dislocation, which is a rare complication. Recurrent dislocation seems to be more common in children than in adults and may be associated with a defect (tear) in the capsule or attenuation of the hip capsule without a tear [14]. Traumatic arthritis is the most prevalent long-term consequence of traumatic hip dislocation, accounting for up to 24% of cases. When the dislocation is coupled with an acetabular fracture, the frequency rises to 88%, as stated by Upadhayay et al. [15]. A 2.8 % incidence of heterotrophic ossification (HO) has been reported in adults following traumatic dislocation [16]. However, the incidence of HO in children following dislocation has not been documented in the literature. Our patient did not have HO at the final follow-up.

The child had an immediate closed reduction of both hips within 2 h of trauma. Both hips were concentrically reduced and a post-reduction CT scan confirmed the same and revealed no soft-tissue interposition or intra-articular fragments. The patient was kept on bed rest for 4 weeks and gradual weight-bearing was initiated over 4 weeks. He was kept on close follow-up for 1 year and had excellent clinical and radiographic results at the final follow-up of 12 months [17]. The child was explained about the possibility of delayed presentation of AVN and post-traumatic arthritis and was educated about the importance of continuing follow-up till 4 years after the traumatic dislocation.

Conclusion

Traumatic hip dislocation is an uncommon injury in children and bilateral posterior dislocation is much rarer with very little literature evidence. In general, younger children are more susceptible to hip dislocation than older children or teenagers. In patients with hip dislocations, prompt diagnosis and a reduction goal of 6 h should be used to limit the risk of AVN in those who did not irreversibly injure the vasculature at the time

of injury. The importance of adequate rest and the indomitable need to continue follow-up to prevent complications has to be kept in mind with traumatic dislocations in children.

Clinical Message

Bilateral traumatic posterior hip dislocation in children is an uncommon clinical condition that requires prompt diagnosis and immediate reduction to prevent complications and ensure an excellent functional outcome.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

References

1. Brav EA. Traumatic dislocation of the hip: Army experience and results over a twelve-year period. J Bone Joint Surg 1962;44:1115-34.

2. Sanders S, Tejwani N, Egol KA. Traumatic hip dislocation--a review. Bull NYU Hosp Jt Dis 2010;68:91-6.

3. Shannak AO. Bilateral traumatic dislocation of the hips with ipsilateral femoral fracture. Clin Orthop Relat Res 1987;215:126-9.

4. Letournel E, Judet R. Fractures of the Acetabulum. 2nd ed. New York: Springer; 1993.

5. Vialle R, Odent T, Pannier S, Pauthier F, Laumonier F, Glorion C. Traumatic hip dislocation in childhood. J Pediatr Orthop 2005;25:138-44.

6. Herrera-Soto JA, Price CT. Traumatic hip dislocations in children and adolescents: Pitfalls and complications. J Am Acad Orthop Surg 2009;17:15-21.

7. Pietrafesa CA, Hoffman JR. Traumatic dislocation of the hip. JAMA 1983;249:3342-6.

8. Pearson DE, Mann RJ. Traumatic hip dislocation in children. Clin Orthop Relat Res 1973;92:189-94.

9. Trueta J. The normal vascular anatomy of the human femoral head during growth. J Bone Joint Surg Br 1957;39-B:358-94.

10. Mehlman CT, Hubbard GW, Crawford AH, Roy DR, Wall EJ. Traumatic hip dislocation in children. Long-term followup of 42 patients. Clin Orthop Relat Res 2000;376:68-79.

11. Hougaard K, Thomsen PB. Coxarthrosis following traumatic posterior dislocation of the hip. J Bone Joint Surg Am 1987;69:679-83.

12. Kellam P, Ostrum RF. Systematic review and meta-analysis of avascular necrosis and posttraumatic arthritis after traumatic hip dislocation. J Orthop Trauma 2016;30:10-6.

13. Glass A, Powell HD. Traumatic dislocation of the hip in children. J Bone Joint Surg Br 1961;43-B:29-37.

14. Ahmadi B, Harkess JW. Habitual dislocation of the hip. A new, simple classification and report of a case. Clin Orthop Relat Res 1983;175:209-12.

15. Upadhayay SS, Moulton A, Srikrishnamurthy A. An analysis of the late effects of traumatic posterior dislocation of the hip without fractures. J Bone Joint Surg Br 1983;65:150-2.

16. Salisbury RD, Eastwood DM. Traumatic dislocation of the hip in children. Clin Orthop Relat Res 2000;377:106-11.

17. Thompson VP, Epstein HC. Traumatic dislocation of the hip; A survey of two hundred and four cases covering a period of twenty-one years. J Bone Joint Surg Am 1951;33-A:746-78; passim.

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