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Case Report

Traumatic Posterior Dislocation of The Hip in A 3 Year-old Child

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ABSTRACT

Traumatic hip dislocation in children is an uncommon injury and constitutes an orthopaedic emergency. The case we present is a 3 year-old girl who dislocated her right hip posteriorly after her brother fell on her. The hip was promptly reduced with gentle manipulation and was immobilized with hip spica cast for 3 weeks. After removing the cast, protected weight-bearing was allowed for 3 weeks. Review at 6 months revealed normal examination and no evidence of avascular necrosis on radiograph. Most children have an excellent outcome after this injury. Avascular necrosis is a well-known and catastrophic complication of traumatic dislocation of the hip in children. Urgent reduction of the hip within 6 hours of injury reduces the risk of avascular necrosis.

Key words: *Traumatic dislocation, hip, children*

3 Yaşında Bir Çocukta Travmatik Posteriyor Kalça Çıkığı

ÖZET

Çocuklarda travmatik kalça çıkığı nadir bir yaralanmadır ve ortopedik bir acildir. Sunduğumuz vaka, kardeşinin üzerine düşmesi sonrası sağ kalçada posteriyor çıkık oluşan 3 yaşında bir kız çocuğudur. Kalça nazik manipulasyonla hemen yerine oturtuldu ve 3 hafta süreyle alçı ile tespit edildi. Alçı çıkarıldıktan sonra 3 hafta korunarak yük vermeye izin verildi. Altıncı aydaki muayenesi normaldi ve röntgende avasküler nekroz bulgusu yoktu. Bu yaralanma sonrası çoğu çocuk mükemmel sonuca sahiptir. Avasküler nekroz, çocuklarda travmatik kalça çıkığının iyi bilinen ve çok kötü bir komplikasyonudur. Yaralanmadan sonraki ilk 6 saatte kalçanın acilen yerine konması avasküler nekroz riskini azaltır.

Anahtar kelimeler: *Travmatik çıkık, kalça, çocuklar*

INTRODUCTION

Traumatic dislocation of the hip joint in children is rare. A greater amount of force is required to produce a hip dislocation in adolescents or adults. However in children it can occur with a relatively minor trauma, which is attributed to a ligament laxity and soft acetabulum (1).

CASE

We report the case of a 3 year-old girl who dislocated her right hip after her 8 year-old brother fell on her in the garden at home. Her parents brought her to the emergency department (ED), reporting that she was unable to move her right leg. According to the parents, she has a normal neuromuscular development with no history of diseases associated with hyperlaxity. Examination was limited due to severe pain; however her affected leg was shortened, adducted, flexed and internally rotated. There was no neurovascular deficit.

Anteroposterior radiograph of the pelvis confirmed a posterior dislocation of the right hip without any associated fracture (Figure 1). Under conscious sedation with combination of ketamine and midazolam in the ED, the hip was easily reduced with gentle manipulation using Allis technique. Total elapsed time from injury to reduction was 1 hour. Post-reduction assessment of the hip showed complete range of motion and the concentric

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***Figure 1**. Anteroposterior radiograph of the pelvis confirming right hip dislocation.*

***Figure 3**. Anteroposterior radiograph of the pelvis taken 6 months after injury. No evidence of avascular necrosis.*

reduction was cofirmed with the control radiographs (Figure 2). Neurovascular examination after reduction was normal. The patient was immobilized with hip spica cast for 3 weeks. After removing the cast, protected weight-bearing and low level activity were recommended. At 6 weeks post-injury, examination showed full range of pain-free motion, then she was allowed to return to normal activity. Review at 6 months revealed normal examination and no evidence of avascular necrosis on X-ray (Figure 3). She is scheduled for control examination for a further year.

DISCUSSION

Traumatic hip dislocations in children are relatively rare injuries and constitute a true orthopaedic emergency. Fewer than 5% of all traumatic hip dislocations occur in the less than 14-years of age (1,2). The incidence in males is three times greater and there is no difference between the sides (1). Bilateral dislocations are exceptional and occur in less than 1% (1,3). Most hip dislocations are posterior, accounting for 80% ; 16% are anterior and 4% central (1,4). An acetabular fracture is relatively common in children with central hip dislocation. Nearly 13% of traumatic hip dislocations have association with a fracture, frequently fracture of the ipsilateral femur (4). The mechanism of injury producing a hip dislocation differs with age. In younger children a trivial fall or an insignificant slip may be sufficient for dislocation because of the ligamentous laxity and soft pliable acetabulum. As the age of the child increases, hip dislocation is associated with a forceful injury, such as may result from an athletic injury or a motor vehicle accident. With increasing age, the cartilage to bone ratio diminishes and the periacetabular structures become more rigid. Therefore in older children, trauma leading to hip dislocation tends to be greater (2,3,5). The relative laxity in young children may also explain the low incidence of acetabular or femoral head fracture in this group (6). In our case, a low-energy trauma could be sufficent to lead to dislocation because of the ligamentous laxity.

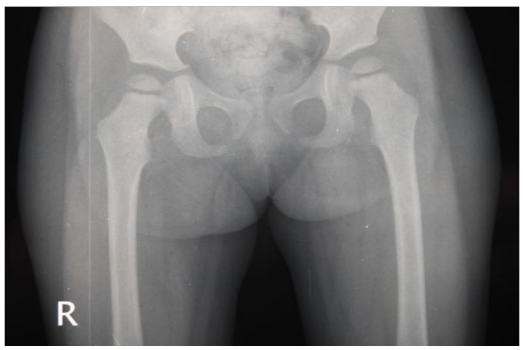

***Figure 2**. After closed reduction. There is no joint space widening compaired with the left hip.*

In posterior dislocation the affected hip is in flexion, adduction and internal rotation. The limb appears shorter than the contralateral limb and the femoral head can be palpated posteriorly. Neurovascular examination should be performed thoroughly. Prompt reduction is most important point in the treatment of traumatic dislocation of hip. This should be done ideally within 6 hours after the injury to minimize the risk of avascular necrosis (1,4-6,7). Closed reduction can be accomplished using the Allis, Bigelow or Stimson methods (4). In all methods the principal manoeuvre of hip flexion relaxes the iliofemoral ligament which forms the chief obstacle to reduction (1,4). We used Allis method due to its simplicity.

Although it is claimed that reduction should ideally be performed not in the ED but in the operating theater under general anesthesia, some authors advocate reduction in the ED with appropriate sedation (4-6,7). Reduction performed in the ED reduces the total elapsed time between injury and reduction, and this is well known as the most important factor for the vitality of femoral head (7). Because of that reduction is usually easy to achieve with gentle manipulation, reduction in the ED is recommended for most hip dislocations in children (6,8). Especially in the conditions which may cause to delay general anesthesia, such as that the operating theater is full, reduction should be performed as soon as possible in the ED. Correspondingly, we achieved successful reduction in the ED. An immediate post-reduction anteroposterior radiograph of the pelvis should be obtained to confirm concentric reduction. Inverted posterior labrum, loose osteocartilaginous fragments and tense haemarthrosis which all cause an asymmetric joint space may prevent congruous reduction. Any joint incongruity noted on radiograph should be evaluated with CT or MRI (1,6). In the presence of incongruity, open reduction may have to be considered. The surgical approach should be from the direction of the dislocation to preserve vascularity and to repair capsular defects (6). There is no consensus on immobilization and rehabilitation in the post-reduction period. Generally accepted method for younger children is immobilization in a spica cast for 3-4 weeks followed by progressive protected weight-bearing and range of motion exercise. In older children, 2-5 weeks of bed rest with or without traction followed by protected weight-bearing is recommended (1,2,6). Some authors believe that the non-weight bearing period is unrelated to outcome (1). Even in the case of a 3 year old child, weight bearing has been allowed as tolerated after the reduction (7). Our patient was immobilized with hip spica cast for only 3 weeks and was allowed to protected weight-bearing under the supervision of her parents. We did not face with any difficulty in rehabilitation process.

The most frequent serious complication after traumatic hip dislocation is avascular necrosis of femoral head (6). The incidence of avascular necrosis varies from 5 to 58%, with relation of time until reduction, severity of injury and age (1,2). Prompt reduction is the most important factor in preventing avascular necrosis. When reduction is delayed more than 6 hours, the risk of avascular necrosis increased 20-fold (9). High-energy trauma and increased age are associated with high risk of avascular necrosis. It is necessary that a child who sustained traumatic hip dislocation must be followed-up at least two year in terms of avascular necrosis. Because of that elapsed time to reduction was 1 hour and the patient was only 3 year old, we did not encounter avascular necrosis during early follow-up. Other complications which may occur include posttraumatic arthritis, coxa magna, heterotopic ossification, recurrent dislocation, sciatic nerve injury and premature epiphyseal fusion (2,10).

In conclusion, traumatic hip dislocation in children which remains an orthopedic emergency is an uncommon but significant condition. Early diagnosis and prompt reduction within 6 hours have an indispensable importance to avoid later complications such as avascular necrosis and osteoarthritis. Outcomes are usually satisfactory with an appropriate management.

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