



Traumatic obturator hip dislocation in a five-year-old boy: open reduction after a six-week delay in diagnosis

Beş yaşındaki çocukta travmatik obturator kalça çıkığının altı hafta gecikmeyle açık redüksiyonu

Mehmet ALBAYRAK, Ahmet DOĞAN, Y. Bilge SUREL

Istanbul Education and Research Hospital Clinic of Orthopaedics and Traumatology

Çocuklarda göreceli olarak nadir görülen travmatik kalça çıkıkları, özellikle beş yaşından küçük çocuklarda önemsiz sayılabilecek travmalar sonrası oluşabilir. Altı hafta önce yaktan düşme öyküsü olan beş yaşındaki erkek çocukta diz ağrısı vardı. Fizik muayenede sol travmatik obturator kalça çıkığı saptandı. Geç kalınmış olması nedeniyle, kapalı redüksiyon denemeksizin açık redüksiyon ve kapsülorafi uygulandı. Bir yıl sonra yapılan kontrolde hastanın yakınmasız olduğu ve fonksiyonel kısıtlamasının olmadığı görüldü.

Anahtar sözcükler: Çocuk; kalça çıkığı/tanı/radyografi/cerrahi.

Hip dislocations are relatively uncommon in children, they may occur before five years of age as a result of seemingly trivial trauma. A 5-year-old boy was admitted with knee pain six weeks after a fall from bed. Physical examination showed obturator dislocation of the left hip. Owing to the late presentation and without attempting closed reduction, the patient was treated with open reduction and capsulorraphy. At the end of a year follow-up, the patient had no complaints and no functional restriction.

Key words: Child; hip dislocation/diagnosis/surgery/radiography.

Traumatic hip dislocations are relatively uncommon in children. The acetabulum of the children who are < 5 years is composed of only a soft cartilage, having an overall ligamentous laxity to prevent any hip dislocation. Certain traumas are required in older children for dislocations due to the more bone stock of the acetabulum in those ages and more tense ligaments. Although lately complications appear, many of the hip dislocations in children can be easily reduced and treated without any complications. Early complications that may occur following the traumatic hip dislocations include neurovascular damage, presence of another fracture, epiphyseal injuries, inability to reduce, and non-concentric reduction while avascular necrosis, coxa magna, arthritis and recurrent dislocations may appear in the late period.

This paper presents management of a late traumatic hip obturator dislocation in a five-year old child with open reduction.

Case report

A five-year old boy was admitted to the emergency polyclinic with a history of fall from bed and complaint of a knee pain immediately after the trauma, but no pathology was found during the evaluations on the knee pain. However, when the patient presented to our polyclinic six months after the trauma due to increasingly worsened gait disturbances, he was diagnosed with left traumatic obturator anterior dislocation of the hip as a result of the clinical and radiological evaluations, and therefore hospitalized (Figure 1).

Because of the late presentation following the trauma, he underwent open reduction without any attempt for closed reduction. Although reduction was primarily attempted through a medial approach, it was failed as the interior part of acetabulum was filled, and capsule was adhered to the acetabulum and its surrounding. Therefore, the hip was secondly approached through anterior iliofemoral incision. The hip was reduced by means of both incisions, followed by a capsulography and an external immobilization with a pelvipedal cast (Figure 2).

As no early post-operative complications were observed, the cast was removed at the end of the second month, followed by initiation of a rehabilitation program including active and passive hip exercises.



Figure 1. An anteroposterior pelvic radiography shows the left obturator dislocation during presentation to the hospital.



Figure 2. A post-operative early anteroposterior pelvic radiograph shows that the reduction was achieved.

At the end of the third month, limping and difficulty in walking were observed in the patient. Physical examinations showed that the range of motion for the hip was within the normal limits except a 20-degrees of limitation for internal rotation and a 25-degrees of limitation for abduction on the left hip. At the end of the sixth month, it was found that the patient had no complaint; range of motion was completely normal, and he was able to easily walk, sit and crouch (Figure 3). At the one-year follow-up, no complaints and no clinical and radiographic pathology were found (Figure 4a). During the magnetic resonance imaging (MRI) for control purposes, no pathological finding suggestive of any avascular necrosis was observed (Figure 4b).

Discussion

Traumatic hip dislocations are very uncommon in children.^[1-13] Those dislocations are divided into two as anterior and posterior depending on the line combining the anterior superior iliac spine with the sciatic tubercle. In anterior and posterior dislocations, they are further classified as superior and inferior depending on the line combining the superior pubic ramus with the greater sciatic notch.^[2] Our patient had an obturator dislocation, which is the most frequent type of anterior inferior dislocations.



Figure 3. Evaluations at month 6 show that the patient was able to fulfill all functions easily.

The anterior inferior dislocation occurs when the hip is at flexion while the anterior superior dislocation emerges as a result of forceful external rotation applied when the hip is at extension. The anterior inferior dislocation in our case appears to be contributed by the external rotation force added when the hip was at flexion during the trauma.

Several studies have shown that there is a relation between the patient's age and the severity of trauma leading to dislocation.^[3-6,8] It has been suggested that low energy-traumas may result in traumatic hip dislocations in younger age groups because of their more elastic periarticular structures.^[7]



Figure 4. (a) No characteristics were demonstrated by the anteroposterior pelvic radiography at the end of the first year. (b) The magnetic resonance imaging showed no evidence in favor of avascular necrosis.

Not all traumatic hip dislocations lead to severe and incapacitating symptoms in children, and sometimes, even ambulation is possible. Similarly, our patients had only a knee pain, and he was able to walk. Presence of mild symptoms may delay the treatment or may lead to misdiagnosis. In our case, late diagnosis delayed the treatment, which might have been resulted in the shortness of limbs and contracture development. Plain radiographs usually confirm the diagnosis. The radiographs should also be evaluated for any accompanied acetabular and/or femoral proximal fractures as ipsilateral femoral fractures were defined in some patients.^[2]

For acute cases, immediate closed reduction and immobilization are the choice of treatment while traction and open reduction followed by immobilization are indicated for delayed cases. A long-term traction sometimes may have a positive effect on the reduction.^[7] Traction, extensive soft tissue release or primarily femoral shortening can be considered if open reduction is required. In delayed cases, open reduction is challenging and may always not be satisfactory. If, even, the hip reduction is maintained, advancing atrophy may result in a painful and rigid hip. Elongation of the dislocation time has a negative impact on the outcome. Our patient had no post-traumatic shortness, but he developed approximately 40 degrees of hip flexion contracture. No traction was performed before the surgery. During the surgery, reduction and capsule repair were performed following the release of the hip flexor and adductor muscle.

The concentric reduction is achieved either spontaneously or manually in children following the traumatic hip dislocations. In case the pain continues or the radiography shows an incongruent hip joint following the reduction, a soft tissue interposition should be suspected between the joint surfaces, and it should be evaluated by arthrography, computed tomography or MRI. If the presence of a soft tissue interposition becomes evident, the tissue needs to be surgically removed. It should be kept in mind that sometimes a single incision may not be sufficient for open reduction in such cases, which are delayed for reduction.

Information on the immobilization period after the reduction is contradictory in the literature. The prevalent opinion is that the immobilization may

range from 4 to 6 weeks up to 4 to 6 months depending on the severity of the intervention and the healing time of soft tissues. However, some authors indicate that this period should be around 2 to 3 months^[9] or four months^[10] as well as there are some others who claim that the immobilization period has no impact on the outcome.^[11] The main point that must be considered during the adjustment of immobilization or non-weight bearing is to prevent development of an avascular necrosis of the femoral head. In our case, the immobilization period was two months where it is very unlikely to develop avascular necrosis of the femoral head in such a short time.

Late complications of the traumatic hip dislocations include avascular necrosis of the femoral head, enlargement of the femoral head, recurrent dislocations and hip dysplasia.^[1,2,7,8,12,13] The most common one is the enlargement of the femoral head. Its main characteristics are sclerosis, flattening and reossification of the epiphysis in children less than 12 years of age.^[1] Fragmentation is not common in each case. None of the cases have remarkable clinical problems. Presence of avascular necrosis of the femoral head is inevitable in traumatic hip dislocations where the acetabulum has been damaged. Our patient had no acetabular impairment.

Avascular necrosis is the most severe complication that may develop following a traumatic hip dislocation, and it is an indication of bad prognosis. Development of avascular necrosis has been reported to range from 3% to 58% following the traumatic hip dislocations.^[1] Among leading factors are advanced age of the patient, delayed time to reduction, severity of the trauma and presence of fractured dislocations.^[2,7] Some authors claim that there is no correlation between the severity of trauma and development of avascular necrosis.^[1] Children with hip dislocations should be followed up for a long period of time as the development of avascular necrosis may take place up to three years.^[1,2,4,7,8,12,13] It is likely that younger age of our patient, lack of a

high-energy trauma and absence of any accompanied fracture reduced the development of avascular necrosis in our case. However, any likelihood to develop an avascular necrosis cannot be excluded as the reduction was performed six weeks after the trauma and post-operative follow-up was only one year. The prognosis following the traumatic hip dislocations is better in children than in adults; however, the underlying cause still needs to be clarified.

References

1. Salisbury RD, Eastwood DM. Traumatic dislocation of the hip in children. *Clin Orthop Relat Res* 2000;(377):106-11.
2. Yamamoto K, Ko M, Masaoka T, Shishido T, Imakiire A. Traumatic anterior dislocation of the hip associated with ipsilateral femoral shaft fracture in a child: a case report. *J Orthop Surg* 2004;12:126-32.
3. Vialle R, Pannier S, Odent T, Schmit P, Pauthier F, Glorion C. Imaging of traumatic dislocation of the hip in childhood. *Pediatr Radiol* 2004;34:970-9.
4. Hamilton PR, Broughton NS. Traumatic hip dislocation in childhood. *J Pediatr Orthop* 1998;18:691-4.
5. Rieger H, Pennig D, Klein W, Grunert J. Traumatic dislocation of the hip in young children. *Arch Orthop Trauma Surg* 1991;110:114-7.
6. Barquet A. Traumatic hip dislocation in childhood. A report of 26 cases and review of the literature. *Acta Orthop Scand* 1979;50:549-53.
7. Blasler RD, Hughes LO. Hip dislocations in children. Fractures and traumatic dislocations of the hip in children. In: Beaty JH, Kasser JR, editors. *Rockwood & Wilkins' fractures in children*. 5th ed. Philadelphia: Lippincott Williams & Wilkins; 2001. p. 929-39.
8. Price CT, Pyevich MT, Knapp DR, Phillips JH, Hawker JJ. Traumatic hip dislocation with spontaneous incomplete reduction: a diagnostic trap. *J Orthop Trauma* 2002;16:730-5.
9. Freeman GE Jr. Traumatic dislocation of the hip in children: a report of seven cases and review of the literature. *J Bone Joint Surg [Am]* 1961;43:401-6.
10. Funk FJ Jr. Traumatic dislocation of the hip in children: factors affecting prognosis and treatment. *J Bone Joint Surg [Am]* 1962;44:1135-45.
11. Pearson DE, Mann RJ. Traumatic hip dislocation in children. *Clin Orthop Relat Res* 1973;(92):189-94.
12. Mehlman CT, Hubbard GW, Crawford AH, Roy DR, Wall EJ. Traumatic hip dislocation in children. Long-term follow-up of 42 patients. *Clin Orthop Relat Res* 2000;(376):68-79.
13. Sahin V, Karakas ES, Turk CY. Bilateral traumatic hip dislocation in a child: a case report and review of the literature. *J Trauma* 1999;46:500-4.