



The greater trochanter located in the acetabulum in a girl with developmental dysplasia of the hip: an unusual complication after redislocation

Gelişimsel kalça displazisi olan bir genç kızda asetabulum yerleşimli büyük trokanter: Tekrarlayan çıkık sonrasında oluşan dışı komplikasyon

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Unstable closed reduction often leads to unsatisfied function. Abnormal force transmission after unstable closed reduction can cause pain, episodes of instability and restriction of range of movement. There is a limited number of literature data which suggests overgrown greater trochanteric located in the acetabulum as a false femoral head without any functional deterioration. In this article, we reported a five-year-old girl with developmental dysplasia of the left hip redislocated following closed reduction. After five-years of follow-up, overgrown greater trochanter was located in the left acetabulum and it unexpectedly resulted in a satisfied function. The unforeseen overgrown greater trochanteric as a false femoral head may lead to a satisfactory function at five-years after reduction. However, long-term follow is required, as its role in early-onset degenerative osteoarthritis remains inconclusive.

Key words: Developmental dysplasia of the hip; femur; recovery of function.

Stabil olmayan kapalı redüksiyon, genellikle tatmin edici olmayan fonksiyon ile sonuçlanır. Stabil olmayan kapalı redüksiyon sonrasında anormal kuvvet iletimi ağrıya, instabilite ataklarına ve hareket aralığı kısıtlılığına yol açabilir. Literatürde asetabulum yerleşimli aşırı derecede büyüyen büyük trokanterin fonksiyonel bozulma olmaksızın hatalı femur başı olabileceğini öngören sınırlı sayıda veri mevcuttur. Bu yazıda, kapalı redüksiyon sonrasında tekrarlayan sol kalça çıkığı ile gelişimsel displazisi olan beş yaşındaki bir kız olgu sunuldu. Beş yıllık takip sonrasında aşırı derecede büyüyen büyük trokanter sol asetabulumda yerleştirildi ve bu işlem, beklenmedik şekilde tatmin edici fonksiyon ile sonuçlandı. Redüksiyon sonrasında beşinci yılda yalancı femur başı olarak büyük trokanterin beklenmedik aşırı düzeyde büyümesi, tatmin edici bir fonksiyon ile sonuçlanabilir. Ancak, bu durumun erken başlangıçlı dejeneratif osteoartritteki rolü kesin olarak bilinmediğinden, uzun süreli takip gerekmektedir.

Anahtar sözcükler: Gelişimsel kalça displazisi; femur; fonksiyon iyileşmesi.

The goal of treating developmental dysplasia of the hip is to obtain and maintain a stable, concentrically-reduced hip joint at as early an age as possible while minimizing complications.^[1] Unfortunately, in 12%-43%^[2] of cases a stable concentric reduction of the hip cannot be achieved after closed reduction.

Unstable reduction such as resistant subluxation and redislocation often leads to unsatisfactory function. Abnormal force transmission can cause pain, episodes of instability and restrictions of range of movement, which result in trouble walking and require secondary surgery.

We describe a redislocation of closed reduction accompanied by good function, for the overgrown greater trochanter was located in the patient's left acetabulum.

CASE REPORT

A five-year-old girl was referred to our clinic due to left developmental dislocation of the hip (Tonnis IV) (Figure 1). Because of poor financial circumstances, the parents refused the open reduction proposal we offered and insisted on closed reduction without operation. Informed consent was obtained from the patient's parents. Longitudinal unilateral skin traction

with 2.5 kg of weight was started with her hip in 45° of flexion and neutral abduction. Later, the hip was abducted into 40° by degrees and taken into full extension. After 15 days traction, gentle closed concentric reduction under general anesthesia was successfully achieved. The patient was treated in a spica cast for a total of four months. After the spica was removed, a plastic splint was fitted to maintain the same position for a further two years' full-time wear, followed by four months of night-time-only use. A radiograph of the pelvis was taken every three months. The patient was followed up for five years and four months.

A radiograph of the pelvis with the hips in the spica was taken right before the spica was removed showed subluxation of her left hip and slight overgrowth of the greater trochanter. Two years and eight months after reduction, the overgrown greater trochanter was located in her left acetabulum, making the head of femur dislocated anterosuperiorly (Figure 2 and Figure 3). After following up over five years and four months, her left hip was stable, painless, with slight decrease of hip movement with positive Trendelenburg. She can



Figure 1. A radiograph shows developmental dislocation of the hip on the left side. It was classified as Tonnis IV.

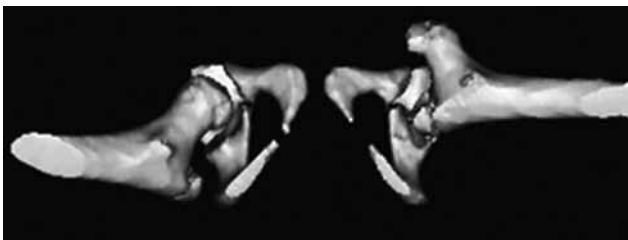


Figure 2. Two years and eight months after reduction, A 3 dimensional (3-D) reconstruction CT scan shows the overgrown greater trochanter was located in patient's left acetabulum as a false femoral head, while the real head dislocated.

walk independently one kilometer or more without discomfort.

DISCUSSION

Closed reduction under general anesthesia is typically attempted in children aged 24 months or younger for developmental dysplasia of the hip.^[3] At the age of five, open reduction combined with pelvic and/or femoral osteotomy is the preferred therapy. In our case, closed reduction was performed on this five-year-old girl because of the parents' insistence, even though open reduction was more appropriate. Advanced age paved the way for the subsequent subluxation and redislocation.

Most acetabular remodeling happens in the first three years after reduction,^[4] and the majority of the acetabular shape is determined by the age of eight years.^[5] Considering the retarded acetabular development and progressive subluxation during the spica-wearing process and reoccurrence of dislocation during the period of plastic-splint-wearing, we decided to extend the time of wearing plastic splint until three-years after reduction when she turned eight.

Overgrowth of the greater trochanter usually occurs secondary to avascular necrosis of the femoral head. Within hips classified as Kalamchi and MacEwen's group IV,^[6] overgrowth of the greater trochanter results in coxa vara. In our case, no evidence of avascular necrosis of the femoral head was found according to the diagnostic criteria made by Salter et al.^[7] We suspect that the greater trochanter kept bearing forces on the level of the acetabulum after the anterior superior dislocation of the femoral head, thus the overgrowth of the greater trochanter was observed.



Figure 3. The direct anteroposterior pelvic roentgenograms shows the femoral head redislocated anteromedially, and the overgrown greater trochanter served as a load-bearing false femoral head.

Few reports in the literature exist to guide us in the next step of treatment. During the last two-years of follow-up, the patient's greater trochanter continued to grow and remodel as the acetabulum sculpted. This false femoral head offered a relatively stable ball-and-socket joint that could deliver the forces down smoothly. Due to the good function, we decided not to perform a second procedure on the patient for the time being.

An unstable closed reduction often shows a link with unsatisfied function and impaired gait, which demands a secondary operation. The unforeseen overgrown greater trochanter as a false femoral head achieves a satisfactory function at five years after reduction. However its role in early-onset degenerative osteoarthritis remains inconclusive. To let the hip remain as it is, or to restore its normal anatomic structure, that is the question. To answer this question, long-term follow-up is needed.

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Declaration of conflicting interests

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