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Case Report

Missed adolescent acetabular apophyseal avulsion with late hip dislocation

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ABSTRACT

Background: Chronic hip dislocation associated with acetabular apophyseal avulsion in adolescence is rare. Whilst superior acetabular rim fractures have a documented theoretical risk of hip instability, we have not found a case of chronic dislocation resulting from this.
Methods: We report a case of a 12-year-old healthy boy who initially sustained a missed right acetabular apophyseal avulsion after falling from a quad bike. This was missed on the initial radiograph and a subsequent radiograph following weight bearing a few days later showed a hip dislocation that was also missed. Upon diagnosis at 6 weeks, he underwent open reduction but also required acetabuloplasty to stabilise the hip.
Results: At 2 years follow-up, he was enjoying pain free swimming, cycling and walking. His Harris hip score was 87.
Conclusion: This case reinforces the need for recognition that in the patient presenting with knee or thigh pain, exclusion of hip pathology is required. It also explores the pitfalls of diagnosis associated with rare patterns of injury and the need for adequate investigations such as examination under anaesthetic, arthrography and MRI. The use of acetabuloplasty is shown to be a useful strategy for the unstable hip resulting from irreparable acetabular rim fracture.

1. Introduction

Acetabular fracture in adolescence is rare; increased joint elasticity, strong ligaments and thicker cartilage provide greater energy absorption before fracture.[1,8] Hip dislocation also requires increasingly high energy as joint laxity reduces through adolescence.[2]

A large UK centre may see 1–2 cases per year of paediatric acetabular fracture,[3] with the presentation being hip, thigh or knee pain in the context of trauma or vigorous movement. 65% of the cases may be associated with acute dislocation.[4] Delayed relocation beyond six hours is associated with poorer functional outcome and twenty-fold increased risk of osteonecrosis, which becomes radiographically apparent within twelve months of dislocation.[5]

Ideally acute management aims to achieve concentric reduction of the joint with restoration of joint stability.[5] Strategies vary from conservative, traction or bed rest, to operative treatment including arthrotomy, open reduction and internal fixation.

We present a rare case of missed acetabular apophyseal avulsion in a young boy who presented with late hip dislocation and sciatic neuropathy, which required an open reduction with acetabuloplasty to achieve a stable hip. He had a good clinical outcome at 2 years follow-up; however, future prognosis remains guarded.

2. Case report

A 12-year-old boy was brought to the emergency department after falling off a quad bike. He sustained a minor head injury and was complaining of right hip and knee pain. Clinical examination revealed right knee abrasion and swelling associated with thigh pain. Knee and hip radiographs were considered to be normal (Fig. 1). In retrospect, there was an acetabular apophyseal avulsion visible on the initial radiographs. Anterior cruciate ligament injury was suspected and the patient was discharged the following day mobilising on crutches partially weight bearing.

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Fig. 1. Anteroposterior radiograph of the pelvis centred on hips showing the right hip to be in joint with an acetabular apophyseal avulsion.

Fig. 3. Anteroposterior radiograph of the pelvis showing chronic dislocated hip at 6 weeks post injury.

In the clinic four days post-injury, there was complaint of pain around the knee and medial thigh tenderness. Adductor sprain was diagnosed following review of the pre-existing radiographs. He was advised to weight bear as pain allowed using crutches. That night his pain significantly increased and he re-attended the emergency department.

After examination and repeat radiographs of the painful right thigh, hip dislocation was visible on orthogonal radiographs of the femur, which was missed, and he was advised to mobilise with crutches (Fig. 2).

Two and a half weeks post-injury, he had abandoned use of crutches but complained of residual discomfort when resisted contraction of his right adductor muscles was undertaken in the clinic. He was discharged from the fracture clinic with a diagnosis of a recovering adductor sprain.

6 weeks after the injury, physiotherapist re-referred him with a shortened, adducted, externally rotated right leg. There was a sensory palsy affecting the peroneal component of the sciatic nerve. Peripheral pulses were intact. Radiographic examination showed a posterior superior complete dislocation of his right hip with fragmentation of bone from an avulsed apophysis at the margin of the acetabulum (Figs. 3–5). The following week, the patient was taken to theatre for right hip open reduction, debridement of chronic fracture dislocation, capsular advancement, reefing and repair. On finding that the hip remained unstable in adduction, a Dega osteotomy augmented by shelf acetabuloplasty was performed to improve stability.

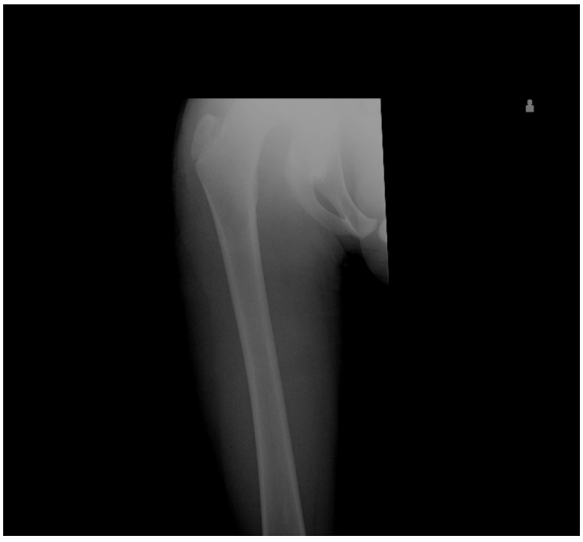

Fig. 2. Day 4 post-injury orthogonal radiograph of the femur showing dislocated hip, which was missed.

The range of movement at the end of the procedure was 10°–40° of abduction; the fixed abduction contracture was accepted rather than repositioning the capsular plication. The hip was stable in flexion to 90° in neutral and with 30° of internal and external rotation.

A hip spica was applied with the right hip in 20° of abduction, 10° of internal rotation and 20° of flexion. The left hip was held in a reciprocal position but the knee was left free on this side.

After uneventful recovery, he was discharged home a week later with instructions to mobilise from bed to chair for 6 weeks after which he was readmitted for physiotherapy.

22 months post-operation he was swimming, cycling and walking without a visible limp. After severe exertion, there was complaint of a short period of posterolateral aching around the hip. Radiographs show grade 4 osteonecrosis[6] (Fig. 6). Harris hip score was 87.[7]

3. Discussion

Avulsion of the acetabular apophysis following low velocity trauma is rare.

The majority of these acetabular fractures in children occur in combination with dislocation of the hip[11,12]; because of the cartilaginous nature of the hip, dislocation of the hip can occur without an acetabular fracture.[12]

When small fractures do occur, they may be encased with cartilage and soft tissue and may spring back to place without being evident on plain radiograph.[12]

In early adolescence, minor trauma can produce a transient hip dislocation, which may spontaneously reduce but with capsular interposition and joint incongruity.[13]

The absence of radiographic verification of dislocation or fracture of the hip in adolescent following an injury can delay the diagnosis of dislocation followed by spontaneous reduction.[13]

According to Watts,[12] acetabular fractures in children are classified into 4 categories: