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CASE REPORT

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Avulsion fractures of the anterior inferior iliac spine: the case for surgical intervention

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Abstract Two cases of avulsion fracture of the anterior inferior iliac spine are reported. One was a missed diagnosis that resulted in exostosis formation needing excision. The second case was an adolescent with significant displacement of the fragment and a primary open reduction and internal fixation was done. A high index of suspicion is necessary to diagnose this relatively rare injury and surgery has a role in carefully selected cases.

Résumé Deux cas d'avulsion-fracture de l'épine iliaque antéro-inférieure sont rapportés. Dans un cas ou le diagnostic n'a pas été fait l'évolution s'est fait vers une ossification qui a nécessité une exérèse. Le deuxième cas était un adolescent avec une fracture à grand déplacement et une réduction ouverte et fixation interne a été faite. Un haut index de soupçon est nécessaire pour diagnostiquer cette lésion relativement rare et la chirurgie a un rôle dans certains cas sélectionnés.

Introduction

Avulsion fracture of the anterior inferior iliac spine is an unusual yet interesting injury. Known as the “sprinter's fracture” [1], it primarily occurs in sports such as football, rugby and soccer, during the kicking phase. These injuries respond to conservative treatment with bed rest, analgesia and gradual mobilization, with a normal outcome [4].

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Case reports

Case 1

A 25-year-old man was referred to the orthopedic clinic with persistent left groin pain. The onset of pain dated back to an injury sustained while attempting to take a penalty kick in a game of football 2 years previously. He was treated as a case of “adductor strain” with rest, analgesia and physiotherapy. He continued to have pain in his groin, which was aggravated by flexion of the hip. Inspection of his lower extremities and pelvis revealed no visible deformity. A moderately tender lump was palpable over the anterior aspect of the left hip in the region of the anterior inferior iliac spine. Range of movement of both hips was within normal limits with discomfort on resisted flexion. Plain radiographs of the pelvis showed an avulsed anterior

Fig. 1 Lateral radiograph of the left hip of the 25-year-old man described in case 1, showing the avulsed anterior inferior iliac spine with new bone formation

Fig. 2 Lateral radiograph of the injured right hip of the 14-year-old boy described in case 2, showing avulsion of the anterior inferior iliac spine with significant displacement

inferior iliac spine with new bone formation (Fig. 1). In view of the symptoms a plan for open reduction and internal fixation was made. On exposure through a modified Smith-Petersen approach, a single mass of exuberant callus was found, which was removed surgically. Two and a half years after the operation the patient is completely asymptomatic and has returned to his normal sporting activity.

Case 2

A 14-year-old boy experienced sudden onset of pain in his right groin while attempting to kick during a football game. On examination he had moderate tenderness in the region of the anterior inferior iliac spine with weakness in straight leg raising due to pain. The range of movement of the right hip was normal. Plain antero-posterior and lateral X-rays of the pelvis showed a displaced avulsion fracture of the anterior inferior iliac spine (Fig. 2). He was initially treated with bed rest and analgesia. A plan to perform open reduction and internal fixation was made based on the significant displacement of the avulsed fragment and persistent weakness of resisted flexion of the right hip. The fracture site was exposed by using a modified Smith-Petersen approach and the anterior inferior iliac spine was displaced by 2.5 cm distally. The avulsed fragment was reattached using a 6.5 mm cancellous screw and washer. The patient was allowed to partially weight-bear on his right leg initially progressing to full weight-bearing. At 1 year after the operation, he was pain free, with full strength in the leg and able to participate actively in sport.

Discussion

The rectus femoris muscle arises from the ilium by two heads, the reflected and the straight heads. The former arises from a shallow concavity above the acetabulum and the latter from the upper half of the anterior inferior iliac spine just above the iliofemoral ligament. It functions as a diarthrodial muscle, causing extension of the leg at the knee and flexion of the thigh at the hip joint.

Avulsion fractures of the anterior inferior iliac spine are less common than those of the anterior superior iliac spine and could possibly be attributed to the early apophyseal closure of the former [2]. They usually occur in adolescents between the ages of 14 and 23 years, when the ratio of muscular strength to physeal strength is greatest [2].

These injuries are usually related to hip hyperextension and knee flexion, which place maximum exertion on the rectus femoris tendon, as in kicking a ball [4]. This sudden muscle contraction to initiate a kick causes the avulsion of the muscle origin through an open apophysis in adolescents. The conventional treatment of this injury includes bed rest and analgesia in the acute stage followed by gradual mobilization as pain allows over a period of a few weeks. The time to full recovery has been reported to vary from 3 weeks to 4 months.

The majority of these fractures heal adequately with conservative treatment. These fractures are, however, not without complications. Irving [3] reported two cases with exostosis formation after conservative treatment with rest and immobilization. These required surgical excision as they caused pain and impaired hip function. Non-union with persistent symptoms at 1 year after the injury in a patient was treated by Saluan and Weiker [5] with open reduction and internal fixation. In the first case reported here, chronic pain and disability could have been minimized by early recognition and surgical intervention. Operative intervention needs to be carefully considered in certain patients to avoid long-standing pain and disability. Indications for surgery are significant displacement of the avulsed fragment (more than 2 cm), non-union of the fracture and exostosis formation.

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