Apophysitis describes a chronic traction injury at the insertion site of a tendon. There is a gradual onset of pain with no clear history of injury. Without adequate preventive methods, an avulsion fracture may result. The case is here reported of an apophyseal avulsion fracture of the anterior superior iliac spine in an adolescent caused by playing football before the end of treatment for apophysitis. An open reduction and internal fixation was performed followed by a rehabilitation programme. No complications occurred, and the patient had returned to his previous level of sporting activity after six weeks.

CASE REPORT

Multiple osteochondroses and avulsion fracture of anterior superior iliac spine in a soccer player

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On physical examination, he had tenderness, crepitation, and swelling over the right ASIS, and was unable to straight raise his right leg because of the pain. There was no active flexion-extension or internal-external rotation.

Posteroanterior pelvis and posteroanterior and lateral hip radiographs of both sides were obtained. Unilateral avulsion of the ASIS was revealed (fig 2). The avulsed fragment was displaced 2.5 cm. Blood tests showed no acute phase reactants or markers of inflammation such as anti-streptolysin O, C reactive protein, rheumatoid factor, or erythrocyte sedimentation rate. Open reduction and internal fixation was our treatment of choice. The surgical approach was started by a small anterior ilioboreal incision. After exploration of the avulsed fragment (fig 3), we manipulated it and debrided the area on the anterior part of the iliac bone. The preliminary reduction was achieved by towel clamp after debridement of the undersurface of the mostly osteochondral fragment. This was 2 × 3 cm in size and very strongly attached to the hip flexor muscles. The fragment was reduced into its original place and internally fixed by two cortical screws with washers and one K wire (figs 4 and 5).

The fixation was stable and no motion was observed during the preoperative control of the passive range of motion of the hip.

The rehabilitation programme was as follows. On the first day after surgery, the patient was taught to mobilise on crutches. During the first week, he started exercises to improve hip mobility. Two weeks after the operation, he started to gradually decrease use of crutches. Four weeks after the operation, he was allowed to start easy training. Six weeks after the operation, he had returned to his normal training and competition routine (fig 6). Eight weeks after the operation, he started to play at the competitive level. There were no complications.
DISCUSSION

In this case report, our patient had Osgood-Schlatter’s disease in both knees and an avulsion fracture in the right ASIS. To the best of our knowledge, this is the first report of a combination of two cases of apophysitis on the same side.

Apophyses are specific regions of ossification where longitudinal growth takes place. Generally, strong muscles are inserted on to these structures. In young athletes, overuse injuries to these structures may result in apophysitis. Avulsion fractures of the apophyses usually occur as a result of a sudden contraction of muscle on immature bone. Injuries of the ASIS, the anterior inferior iliac spine, and the ischial tuberosity have been described in children and adolescent footballers, caused by a sprint or sudden flexion of the hip during the kicking phase. In our case, hyperextension of the hip and flexion of the knee resulted in the avulsion fracture of the ASIS with apophysitis during the kicking. This suggests that treatment of apophysitis should be undertaken more seriously than was thought to prevent serious situations such as avulsion fractures.

Avulsion fractures around the pelvis are usually treated by conservative means, consisting of initial bed rest, non-weight bearing, and gradual mobilisation. Most previous reports of injuries located at the iliac crest, ASIS, and anterior inferior iliac spine have shown good or excellent recovery. When displacement of the avulsed apophysis is more than 2 cm, a surgical procedure is recommended. Therefore, we performed open reduction and internal fixation in our case. There are reports of track athletes who achieved return to sport four weeks after surgery. As our patient was involved in a contact sport, we only allowed him to return to sporting activity at the 6th week and to play football at the 8th week. At the 6th month follow up, he had no symptoms and continued to play football.

Generally, there is a history of overuse in the background of apophysitis in athletes. Overuse injury to a tissue results from repetitive submaximal loading. The process starts when repetitive activity fatigues a specific structure such as tendon or bone. With sufficient recovery, the tissue adapts to the demand and is able to undergo further loading without injury. Without adequate recovery, microtrauma develops and stimulates the body’s inflammatory response, causing the release of vasoactive substances, inflammatory cells, and enzymes that damage local tissue. As we observed apophysitis in both the knee and ASIS on the right side, the dominant kicking side of the patient, cumulative microtrauma from repetitive activity may be one of the underlining causes of this clinical injury.

In conclusion, when apophysitis is diagnosed in an adolescent athlete, other regions exposed to high loads should also be evaluated.
Avulsion fracture after apophysitis

What is already known on this topic
Apophysitis describes a chronic traction injury at the tendon insertion site. It is characterised by gradual onset of pain with no clear history of injury. An apophyseal avulsion fracture is usually acute, and the displaced fragment may be bony or cartilaginous. Apophyseal injuries occur in skeletally immature patients.

What this study adds
Treatment of apophysitis should be undertaken more seriously than previously to prevent serious situations such as avulsion fractures. When apophysitis is diagnosed in an adolescent athlete, other regions exposed to high loads should also be evaluated.

References