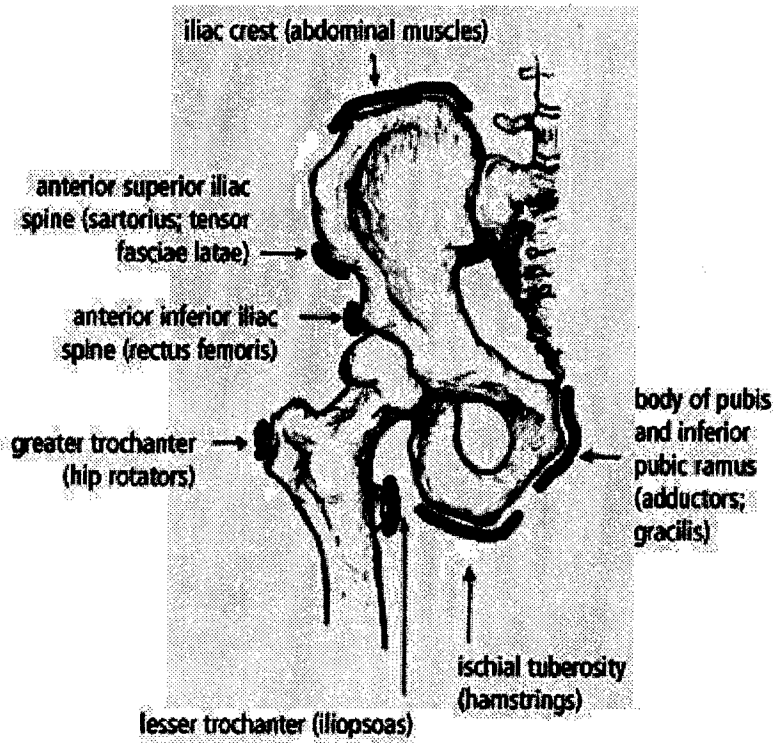


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<http://secure.childrensmemorial.org>

/cme/images/content/LaBella\_spring05\_Fig3.gif, Accessed 5/2006

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Injuries at the pelvic area in young athletes due to training can be Apophyseal or Apophysitis. The apophysis is the growth cartilage site where a major tendon inserts on the growing bone. The apophysis has its own growth plate that is separate from the physeal plate. Apophyseal injuries occur in skeletally immature athletes, as an acute injury, primarily between the ages of 13 and 25. Apophysitis is a chronic injury due to traction at the tendon insertion area. As a result we have a gradual onset of pain with no clear history of injury. Examination reveals tenderness to palpation at the musculotendinous insertion into the bone.

Apophyseal avulsion fractures are usually acute, and the displaced fragment may be bony or cartilaginous. The mechanism of injury is from a violent muscle contraction that occurs across an open apophysis. Sudden onset of pain, swelling, and weakness are usual the symptoms of an apophyseal avulsion fracture. Generally, there is no history of direct trauma. Radiographs is always necessary to confirm the diagnosis. Treatment of all of the apophyseal is usually non operative.

Apophyseal injuries are unique to patients with skeletal immaturity. Apophyseal injuries involve inflammation at the site of a major tendinous insertion onto a bony prominence that is undergoing active growth. Several theories have been postulated to account for the development of apophyseal injuries. The first theory is that injury develops from a major traumatic event to the apophysis, such as a violent contraction that avulses a portion of the apophysis and is followed by inflammation. A second theory is that injury develops from repetitive microtrauma to the apophyseal area, which causes multiple tiny avulsion fractures. This process is followed by an inflammatory cycle, which is believed to develop from repetitive running and jumping in such sports as soccer, basketball and distance running. A third theory is that injury is due to a macrotraumatic event that is either preceded or followed by multiple episodes of repetitive microtrauma to the apophysis.

Another factor in the occurrence of apophyseal injury is the element of growth.(4) In athletes with skeletal immaturity who are going through a growth spurt, significant muscle-tendon imbalance commonly develops. Muscle-tendon imbalance manifests as tight and inflexible muscle groups. Such a muscle-tendon imbalance occurs because

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muscle development lags behind bony development. This relative inflexibility can adversely affect the developing apophysis by increasing the traction forces on this site. This sequence of events sets up an environment that is conducive to the development of apophyseal injuries, especially with the addition of repetitive microtrauma from sports activity.

Ice should be used at the beginning and rest. Then stretching, strengthening, and proprioception. Most of these injuries are managed conservatively, and indications for surgical fixation are exceedingly rare only in significant displaced avulsions. Premature return to sport may result in re-injury.

Anterior superior iliac spine avulsion (ASIS) occurs during sudden contraction of the sartorius when the hip is extended with the knee flexed. On clinical examination, localized tenderness and/or swelling is present and flexion and abduction of the thigh provokes the symptoms. On x-rays displacement of the ASIS is noted. Marked displacement is rare.

Anterior inferior iliac spine avulsion (AIIS) can result after contraction of the rectus femoris with kicking. Examination reveals local tenderness and swelling in the region of the AIIS and exacerbation with active flexion. On x-rays demonstrate displacement of the AIIS.