

# AVULSION FRACTURES OF THE ANTERIOR INFERIOR ILIAC SPINE (AIIS)



## ■ ■ ■ Description

Avulsion fractures are separations of bone due to pulls of muscle-tendon units. These may occur in fully grown athletes, although in the pelvis they tend to occur more commonly in skeletally immature (growing) athletes. This is due to the relative weakness of the growth plate as compared with the bone, muscle, and tendon. The growth plate is an area of relative weakness, and injury to it commonly occurs with repeated stress or vigorous exercise. An avulsion in the growing athlete thus is a separation of bone at the growth plate. A similar injury in adults is a muscle-tendon strain. Because the pelvic growth plates close at skeletal maturity, this problem is uncommon in persons who are fully grown.

The AIIS is the bony attachment of part of one of the quadriceps (thigh) muscles, the rectus femoris. The quadriceps are important in bending the hip and straightening the knee.

## ■ ■ ■ Common Signs and Symptoms

- A slightly swollen, warm, and tender area in the front of the hip
- Pain with activity, especially stretching the muscle or having the muscle contract to perform its function (forcefully bending the hip or straightening the knee or stretching with the knee bent and hip straight [the hurdler's stretch])
- Pain with walking (often walking with a limp)
- Pop heard in the area at the time of injury
- Crepitation (a crackling sound) when the area is touched
- Bruising in the thigh 48 hours following the injury
- Weakness when bending the hip

## ■ ■ ■ Causes

- A powerful contraction of the quadriceps muscles, such as with kicking sports, with force exceeding the strength of the growth plate

## ■ ■ ■ Risk Increases With

- Sports that require kicking, such as soccer, football kicking, and rugby
- Poor physical conditioning (strength and flexibility)
- Inadequate warm-up before practice or play
- Previous thigh, knee, or pelvis injury
- Poor technique
- Poor posture

## ■ ■ ■ Preventive Measures

- Appropriately warm up and stretch before practice or competition.
- Maintain appropriate conditioning:
  - Strength, flexibility, and endurance
  - Cardiovascular fitness

## ■ ■ ■ Expected Outcome

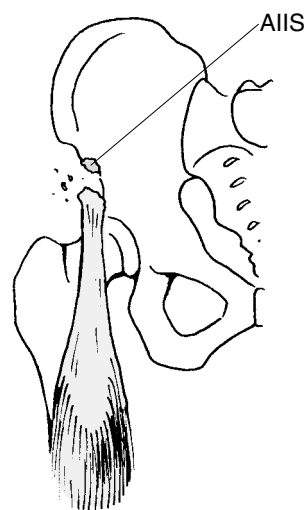
These fractures do not move too far out of normal alignment and can heal without surgery. Patients return to sports in an average of 4 to 12 weeks.

## ■ ■ ■ Possible Complications

- Recurrent symptoms and quadriceps strains, especially if activity is resumed too soon
- Prolonged healing time if usual activities are resumed too early
- Nonunion (no healing of bone)
- Malunion (healing in a bad position)
- Weakness of the hip and knee

## ■ ■ ■ General Treatment Considerations

Initial treatment consists of medications and ice to relieve pain, stretching and strengthening exercises (particularly of the thigh muscles), and modification of activities. The exercises can all be carried out at home for acute cases, or a referral to a physical therapist or athletic trainer may be necessary for further evaluation or treatment. Use of crutches while limping may be helpful. Relative rest, particularly avoiding the activity that caused the problem, is helpful. Some feel surgery is beneficial to re-attach the bone, although this is unnecessary for most cases.



**Figure 1**

From Shankman GA: Fundamental Orthopaedic Management for the Physical Therapy Assistant. St. Louis, Mosby Year Book, 1997, p. 206.

**■ ■ ■ Medication**

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen, are often recommended to reduce inflammation (do not take within 7 days before surgery). Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur. Other minor pain relievers, such as acetaminophen, may also be used.
- Pain relievers may be prescribed as necessary. Use only as directed and only as much as you need.

**■ ■ ■ Heat and Cold**

- Cold is used to relieve pain and reduce inflammation for acute and chronic cases. Cold should be applied for 10 to 15 minutes every 2 to 3 hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.

- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

**■ ■ ■ Notify Our Office If**

- Symptoms get worse or do not improve in 4 weeks despite treatment
- New, unexplained symptoms develop (drugs used in treatment may produce side effects)

Notes:

(Up to 4400 characters only)

Notes and suggestions