



# Avulsion Fracture of the Anterior Superior Iliac Spine

## DESCRIPTION

Avulsion fractures of the anterior superior iliac spine (ASIS) are separations of bone resulting from 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 compared with the bone, muscle, and tendon. Injury to the growth plate commonly occurs with repeated stress or vigorous exercise, and an avulsion in the growing athlete is thus 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, avulsion fracture of the ASIS is uncommon in persons who are fully grown.

The ASIS is the attachment of the *sartorius*, a thigh muscle that is important in bending the hip and knee.

## COMMON SIGNS AND SYMPTOMS

- A slightly swollen, warm, and tender area of the pelvis where the bone pulled off
- Pain with activity, especially when stretching the muscle or having to contract the muscle to perform its function, such as forceful bending of the hip or knee or stretching the thigh muscles by straightening the hip and knee
- Pain with walking, often walking with a limp
- A popping sound in the area at the time of injury
- Crepitation (a crackling sound) when the area is touched
- Bruising in the thigh 48 hours after the injury
- Weakness when bending the hip

## CAUSES

Avulsion fracture of the ASIS is caused by a powerful contraction of the sartorius muscle, such as with jumping and running sports, with force exceeding the strength of the growth plate.

## FACTORS THAT INCREASE RISK

- Sports that require jumping, such as basketball, volleyball, or high or long jumps
- Sports that require running or sprinting
- Poor physical conditioning (strength, flexibility)
- Inadequate warm-up before practice or play
- Previous thigh, knee, or pelvis injury
- Poor technique
- Poor posture

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## PREVENTIVE MEASURES

- Appropriately warm up and stretch before practice or competition.
- Maintain appropriate conditioning that includes strength, flexibility, endurance, and cardiovascular fitness training.

## EXPECTED OUTCOME

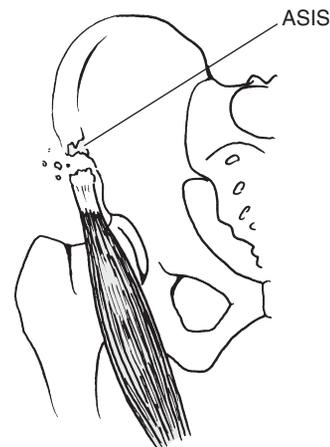
These fractures do not move too far out of normal alignment and can heal without surgery. Patients return to sports in an average of 4 to 12 weeks.

## POSSIBLE COMPLICATIONS

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

## GENERAL TREATMENT CONSIDERATIONS

Initial treatment consists of medication 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, but a referral to a physical therapist or athletic trainer may be necessary for further evaluation or treatment.



**FIGURE 1** From Shankman GA: *Fundamental orthopedic management for the physical therapy assistant*, St Louis, 1997, Mosby Year Book, p 206.

Use of crutches may be helpful for limping patients, along with rest, particularly avoiding the activity that caused the problem. Some feel surgery is beneficial to reattach the bone, although this is unnecessary in most cases.

## **MEDICATION**

- Nonsteroidal antiinflammatory medications, such as aspirin and ibuprofen, are often recommended to reduce inflammation (do not take for 7 days before surgery). Take these as directed by your physician, and contact your doctor 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 take 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.

## **WHEN TO CALL YOUR DOCTOR**

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