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SHOULDER, KNEE & SPORTS MEDICINE

Tibial Eminence (Spine) Fracture

A tibial eminence fracture is a partial or complete fracture of the attachment of the anterior cruciate ligament (ACL), one of the four major ligaments of the knee. The ACL is a ropelike structure that helps keep the normal relationship of the femur (thigh bone) and the tibia (leg bone). This ligament is most important in sports that require pivoting, changing direction (cutting), or jumping and landing. In young children, the bony attachment of the ACL is more likely to break off (fracture) than the ligament is to tear (sprain). The ACL is also sometimes stretched in conjunction with the bone pulling off the leg bone (tibia).

Xray of Right Leg Tibial Eminence Fracture

Frequent Signs and Symptoms

- Pop or tear heard or felt at the time of injury
- Large knee swelling noticed almost immediately (within 3 hours)
- Inability to straighten knee
- Pain around the knee and difficulty standing on the leg
- Knee giving way or buckling, particularly when trying to pivot, cut (rapidly change direction), or jump; often, swelling with repeated giving way
- Occasionally, locking when there is concurrent injury to the meniscus cartilage

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Etiology (Causes)

A tibial eminence fracture is caused by force that exceeds the strength of the bone. This injury may be because of a noncontact injury (landing awkwardly or cutting while cleats are stuck to the ground) or from contact, such as getting tackled at the knee just like with ACL injuries.

Risk Factors

- Sports that require pivoting, jumping, cutting, or changing direction (basketball, soccer, volleyball) or contact sports (football, rugby)
- Poor physical conditioning (strength and flexibility)
- Athletes under 14 years of age
- Improper equipment, (long cleats)

Prevention

- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning:
  - Thigh, leg, and knee flexibility
  - Muscle strength and endurance
  - Cardiovascular fitness
- Use proper technique.
- Wear proper equipment (such as the correct length of cleats for the surface).

Outcomes

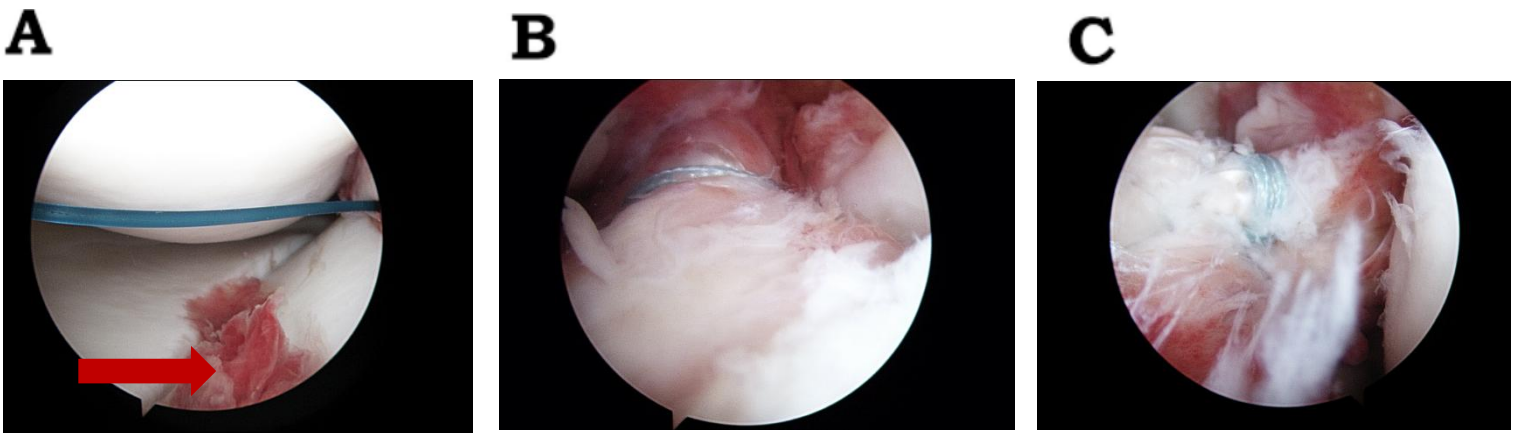
The bone will usually heal, although residual knee looseness and giving way may occur, especially with sports that require pivoting, cutting, jumping and landing. Treatment focuses on reducing the fracture and restoring the connection and function of the attached ACL.

Potential Complications

- Failure to heal (nonunion)
- Healing in a poor position (malunion)
- Frequent recurrence of symptoms, such as knee giving way, instability, and swelling
- Injury to meniscal cartilage, resulting in locking and swelling of the knee
- Injury to other structures of the knee, including the articular cartilage, resulting in arthritis of the knee
- Injury to other ligaments of the knee
- Knee stiffness
- Risks of surgery, including infection, bleeding, injury to nerves (numbness, weakness, paralysis), and need for further surgery (ACL reconstruction)

Treatment Considerations

Initial treatment consists of medications and ice to relieve pain and reduce the swelling of the knee. If the fractured bone fragment is in the proper position or can be positioned without surgery, immobilization with a brace or cast for 4 to 6 weeks is recommended. Crutches may be recommended for walking. If the bones are not in proper position, surgery is usually needed to reposition the fracture and hold it with sutures, wires, or screws. After immobilization (with or without surgery), stretching and strengthening of the injured and weakened joint and surrounding muscles (due to the injury and the immobilization) are necessary (with physical therapy). These may be done with or without the assistance of a physical therapist or athletic trainer. The sutures, wires, or screws usually do not need to be removed.



Arthroscopic images demonstrate the tibial eminence fracture (A), and sutures in the ACL fracture holding the fragment in place (B, C)

Possible Medications

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (do not take within 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Your physician may prescribe stronger pain relievers as necessary. Use only as directed.

Modalities (Heat and Cold)

- Cold is used to relieve pain and reduce inflammation. Cold should be applied for 10 to 15 minutes every two to three hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage with a cloth between the ice and your skin to prevent burning /freezing your skin.

- 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 My Office If Symptoms Worsen