

TIBIAL STRESS FRACTURE



■ ■ ■ Description

A tibial stress fracture is a complete or incomplete break in the larger of the two leg bones (tibia) caused by intense exercise or repetitive pressure on the extremity. The wear and injury to the bone exceeds the bone's ability to heal and repair the injury, resulting in a breakdown of the bone, causing a stress or fatigue fracture. This is the most common bone to sustain a stress fracture in athletes. It can occur anywhere within the tibia.

■ ■ ■ Common Signs and Symptoms

- Vague, diffuse pain or ache and occasionally tenderness and swelling in the leg or calf
- Uncommonly, bleeding and bruising in the leg
- Weakness and inability to bear weight on the injured extremity
- Paleness and deformity (sometimes)

■ ■ ■ Causes

A stress fracture is caused by repetitive forces greater than the bone can withstand. It usually occurs when there is an imbalance between bone injury and bone remodeling (healing) and usually follows a change in training or performance schedule, equipment, or intensity. It is also associated with a bone's ability to heal, which may be impaired when there is a loss of menstrual period in women.

■ ■ ■ Risk Increases With

- Previous stress fracture
- Military recruits and particularly distance runners
- Bony abnormalities (including osteoporosis and tumors)
- Metabolic disorders, hormone problems, and nutritional deficiencies and disorders (anorexia or bulimia)
- Loss of or irregular menstrual periods in women
- Poor physical conditioning (strength and flexibility)
- Sudden increase in the duration, intensity, or frequency of physical activity
- Running on hard surfaces
- Poor extremity alignment, including flat feet
- Inadequate footwear with poor shock-absorbing capacity

■ ■ ■ Preventive Measures

- Appropriately warm up and stretch before practice or competition.
- Maintain appropriate conditioning:
 - Leg muscle strength
 - Endurance and flexibility
 - Cardiovascular fitness
- Wear proper footwear; change shoes after 300 to 500 miles of running.

- Use proper technique with training and activity.
- Gradually increase activity and training.
- For women with menstrual period irregularity, treat hormonal disorders, such as with birth control pills.
- Correct metabolic and nutritional disorders.
- For runners with flat feet, wear cushioned arch supports.

■ ■ ■ Expected Outcome

This condition is usually curable with appropriate treatment, although return to sports may average 1 year from the onset of treatment.

■ ■ ■ Possible Complications

- Failure to heal (nonunion), especially when the stress fracture involves the front part of the middle third of the tibia and when the radiographs show a black line (a sign of poor healing response)
- Recurrence of stress fracture
- Stress fracture progressing to a complete and displaced fracture
- Risks of surgery, including infection, bleeding, injury to nerves (numbness, weakness, paralysis), and need for further surgery
- Another stress fracture, not necessarily at the same site (occurs in 1 in 10 patients)

■ ■ ■ General Treatment Considerations

Initial treatment consists of medications and ice to relieve pain and relative rest from the activity that caused the fracture. Occasionally crutches may be recommended to protect the bone while it heals. Menstrual, nutritional, and metabolic abnormalities need to be identified and treated appropriately to help healing and prevent recurrence. After rest, gradual return to activity is recommended. Uncommonly, bone stimulators, which provide electrical currents to the bone, may be recommended. Physical therapy may be helpful in gradually increasing strength of the muscles and bones after stress fracture and in maintaining cardiovascular fitness while waiting for the bone to heal. Surgery is rarely necessary, although it may be offered for fractures that do not heal after 6 months despite appropriate conservative treatment.

■ ■ ■ Medication

- 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.
- Topical ointments may be of benefit.

- Narcotic pain relievers may be prescribed by your physician for severe pain. Use only as directed.

■ ■ ■ **Notify Our Office If**

- Symptoms get worse or do not improve in 2 weeks despite treatment
- The following occur after immobilization or surgery (report any of these signs immediately):
 - Swelling above or below the fracture site
 - Severe, persistent pain
 - Blue or gray skin below the fracture site, especially under the nails, or numbness or loss of feeling below the fracture site
- New, unexplained symptoms develop (drugs used in treatment may produce side effects)

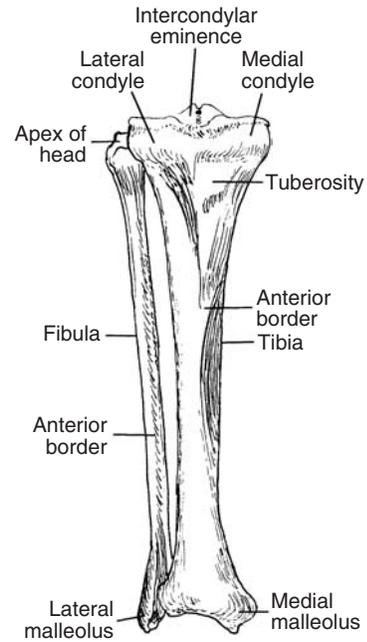


Figure 1

From Nicholas JA, Hershman EB: The Lower Extremity and Spine in Sports Medicine. St. Louis, Mosby Year Book, 1995, p. 524.

Notes:

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Notes and suggestions