

Tibial Stress Fractures

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ABSTRACT

CLINICAL PRESENTATION & EXAM: Distance runners are prone to stress fractures, in particular, tibial stress fractures appear to be more common due to their rear foot striking pattern (RFS). A tibial stress fracture is a bone stress injury (BSI) that usually occurs on the diaphysis of the tibia as a result of overuse. Local and radiating pain along the anterior surface of the tibia is one of the primary symptoms that patients with tibial stress fractures exhibit. An inability to bear weight on it may also occur in more serious cases. **ANATOMY & PATHOLOGY:** Bone stress is a microstrain that occurs from mechanical loading during running, and over time this microstrain may build up causing pain and localized tenderness. During high impact activities, the tibia is slightly deformed resulting in microdamage on the bone. Under normal conditions, remodeling will usually remove damaged bone as fast as it happens, but when strain becomes too much, the remodeling is unable to keep up with the pace of the microdamage. Remodeling results when osteoclasts clean out old damaged bone, and osteoblasts lay down a new layer of bone matrix. When the body is consistently overloaded during high impact activity, the microdamage will begin to appear faster than the osteoclasts and osteoblasts can repair. Eventually the damage will create a fracture. **DIAGNOSTIC TESTING & CONSIDERATIONS:** There are different ways to diagnose a BSI. As the microdamage worsens, irritation along with increased pain will result in the individual consulting a medical professional. Evaluation of the injury is assessed through the use of an X-ray, bone scan, or MRI. **TREATMENT & RETURN TO ACTIVITY:** One of the first plans of treatment is to modify the individual's activity. Ceasing high-impact activities until the fracture has been given enough time to heal is imperative. Treatment options include deep water running whereby the individual mimics the mechanics of running thereby eliminating the high impact of running on the tibia. Antigravity training involves running on a modified treadmill alleviating the amount of stress on the lower body. Another technique is gait training that involves therapy to retrain the individual's gait in order to prevent BSI's that may have occurred from poor mechanics. Correcting the mechanics of the movement may alleviate the BSI by reducing strain on the tibia. Treatment progression is gradual so as to prevent further BSI aggravation. If the individual is able to complete each stage of the treatment progression without aggravating the BSI, then the individual may be able to return to running.