Medial Tibial Stress Syndrome

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Medial tibial stress syndrome (MTSS), shinsplints, stress fractures, stress reactions, periositis, fascitis, and deep posterior compartment syndrome are all terms that have been used to describe pain along the medial tibial border. In fact, subcategories of these terms have been proposed in order to create classification systems of medial tibial symptoms.

Shinsplints, the term commonly used by lay persons, is most often seen in populations that engage in activities such as running, jumping, or marching. However, Jones et al. (1989) pointed out that most of the research on stress fractures has been conducted on military populations and that no significant data has been collected on a civilian running sample.

A study by Brynhildsen et al. (1990) found that 22% of the injuries in women's soccer were overuse injuries. Of that 22%, 72% were tibioperiostitis, or shinsplints.

This article presents a case study involving a stress fracture and stress reaction in a female soccer player. Suggested etiologies are reviewed and treatment methods are examined.

Case Report

A 17-year-old female high school soccer player presented with bilateral medial arch pain at the beginning of the 1996 season. She had no previous history of arch pain, and no acute mechanism was suggested. Signs and symptoms were localized in the area of the navicular, and the injury was assessed as a medial arch sprain due to new soccer shoes and an increase in activity. Treatment consisted of arch strengthening exercises, medial arch taping, and icing after practice.

At 2 weeks postinjury the athlete began to complain of bilateral medial shinsplints. Reevaluation demonstrated a bilateral pes planus stance and pain along the distal one-third of the medial tibial border. Reassessment suggested a posterior tibialis tendinitis or possibly a mild stress reaction. The athlete was advised to reduce training load, stretch, ice postpractice, and take anti-inflammatories.

Two weeks following reevaluation, the pain had increased. This was due in part to the athlete's noncompliance with the treatment protocol and to pressure to compete.

The athletic therapist concurred with the reevaluation and believed orthotics would relieve the arch pain and help relieve tension on the posterior tibialis tendon. Orthotics were made and the arch pain subsided within 3 days.
but the shin pain continued. The athlete took a 4-day rest and returned to play despite continuous medial tibial pain. For the next 2 weeks she practiced as pain allowed. Her condition did not improve and a doctor referral was advised.

The athlete’s pediatrician ordered a triple-phase bone scan (TPBS) to rule out a stress fracture. The TPBS revealed a “focal intense bony abnormality involving the posteromedial aspect of the right distal tibial shaft... highly consistent with an acute stress fracture,” and “milder focal increases seen in the posterior aspect of the left distal tibial shaft... somewhat more segmental and milder in intensity... suggest either evolving stress fracture or localized stress reactions” (Rutz, 1996, unpublished data from nuclear medical report) (Figure 1).

The pediatrician recommended 4 to 6 weeks rest with minimal weight-bearing activity. The athlete was highly motivated to finish the season, however, as she was a senior and the team had made the state playoffs. She was released by the physician to play to the point of pain in conjunction with strict adherence to an ice/anti-inflammatory therapy.

The athlete and her parents were also counseled on the risk of traumatic tibial failure and accepted liability for further injury. The athlete finished the season with no traumatic tibial failure and rested the prescribed 6 weeks. At 2 months postseason, she was asymptomatic and began conditioning for the softball season.

**Etiology**

Many etiologies have been credited as contributing to the pathology of shinsplints. A great deal of literature has been published suggesting that stress fractures and stress reaction are a primary cause of shinsplints. Thus a definition of stress fractures is in order.

*Tabor’s Cyclopedic Medical Dictionary* (1989) defines a stress fracture as a “fine hairline fracture that appears without evidence of soft tissue injury... occurring from repetitive micro-trauma; as with running, aerobic dance, or marching, with improper shoes, on hard surfaces, or inadequate healing time after stress” (p. 644).

Research by Jones et al. (1989), Detmer (1986), Fredericson et al. (1995), and Hulko and