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**Examination and Treatment of Medial Tibial Stress Syndrome**

 When I was a high school cross country runner, almost every member of the team developed “shin splints” at some point during the season. We thought that this was just a normal part of being a runner. For some runners the pain eventually dissipated, but others had to suffer with shin pain with every step they took. In high school I thought that shin splints were inevitable and untreatable, but there are steps you can take to prevent and treat Medial Tibial Stress Syndrome (MTSS).

 There are still a lot of unknowns with MTSS, including its etiology. Some theories suggest that MTSS may be due to a traction force on the periosteum from strong calf muscles.3 Others suggest that MTSS is caused by repetitive bending loads on the tibia which causes microdamage that exceeds a threshold and can no longer be repaired.3 There may in fact be different types of MTSS with distinct etiologies.4

 MTSS affects 4-35% of athletes and military personnel.1 The strongest risk factors for the development of MTSS include foot overpronation, female gender, and a history of MTSS.3 Other risk factors include increased inversion and eversion passive range of motion (ROM), increased plantar flexor strength and ROM, greater hip internal and external rotation ROM, and a shorter running history.3

 Patients with MTSS will complain of running-induced leg pain at the middle or distal 1/3 of the posteromedial border of the tibia.3 Initially pain is present with early activity and subsides with continued exercise, but overtime pain may also be felt at rest or with simple activities.3

 During examination, patients with MTSS will usually have tenderness to palpation along the distal 2/3 of the posteromedial border of the tibia, pain with hopping, and pain on percussion.3 Runners with MTSS have greater midfoot pronation on the navicular drop test and are more likely to have early heel rise, forefoot abduction, and a propulsive gait.3 The Foot Posture Index (FPI-6) can be used to quantify the amount of forefoot and rearfoot pronation or supination.2 The MTSS Score is a patient-reported outcome measure that can be used to assess injury severity.5 Imaging has not been shown to be able to differentiate between athletes with and without MTSS, so imaging should only be used if there is concern for a stress fracture.4 Stress fractures should be considered if the patient has localized tenderness to the anterior middle 1/3 of the tibia.3

 Treatment of MTSS includes addressing risk factors and then guiding a gradual return to running. This can include prescribing shock absorbing insoles or orthotics to prevent foot overpronation and strengthening the anterior tibialis, intrinsic foot muscles, and hip musculature. Compressive splints may also be helpful in dissipating forces on the tibia.

It is currently very difficult to give patients an accurate prognosis on return to sport. It is recommended that athletes can gradually progress loading when they are able to run for 18 consecutive minutes with <5/10 pain on the Visual Analogue Scale.4 However, symptoms of MTSS can last up to 2 years, with females tending to take a longer time to recover.4

Measures to prevent MTSS include replacing shoes every 350-450 miles, stretching calves and hamstrings, gradually increasing running and jumping activities, exercising on softer surfaces, strengthening foot and hip musculature, and maintaining a healthy weight.

 Although aspects of MTSS are still a mystery, addressing modifiable risk factors can help to prevent and speed the recovery of patients suffering from MTSS.

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