Turf Toe

OVERVIEW
You have been diagnosed with a turf toe injury. This is the common name for a sprain of the great toe metatarsophalangeal joint. It commonly occurs while playing sports on artificial turf, but occurs in other situations as well. Typically the toe is forced into upward dorsiflexion or the foot is pushed down as the toe hyperextends. This hyperextension can disrupt the ligaments and can injure the joint surfaces. Recovery can be slow and unfortunately it is a difficult joint to protect while continuing activity. The injury to the joint surface creates some degree of arthritis, which can lead to lasting pain and stiffness in the joint.

BACKGROUND
The joint at the base of the big toe is the first metatarsophalangeal joint. The anatomy of the joint allows for motion and strength. In this joint, as in any joint, the ends of the bones are covered by a smooth articular cartilage. The stability is controlled by the joint surfaces and strong fibrous ligaments. The strength for motion comes from the toe extensor and flexor muscles. This joint is important for push-off especially in sports requiring cutting or accelerating.

The plantar aspect of the joint is important. The metatarsal head articulates with the medial and lateral sesamoids on its plantar aspect. The sesamoids are contained within the tendon of the flexor hallucis brevis and are connected to the base of the proximal phalanx by the plantar plate. Medial and lateral stability of the sesamoids is imparted by the tendons of the abductor and adductor hallucis as well as by the intersesamoidal ligament. This complex stabilizes the plantar aspect of the joint.

Injury to this joint can be very debilitating for athletes. Turf toe can often progress into a chronic problem, in which the joint never really heals or heals slowly and limits return to usual physical activities. If there is wear-and-tear arthritis or traumatic arthritis to the articular cartilage, the raw bone ends can rub together. A bone spur, or overgrowth, may develop on the top of the bone. This overgrowth can prevent the toe from bending as much as it needs to when you walk. The result is a stiff and painful joint, or hallux rigidus.
DIAGNOSIS
Turf toe occurs as a hyperextension injury to the great toe. The term was originally coined for football and soccer players who injured their toes on artificial turf. Runners and other athletes who do not compete on artificial turf can also sustain this injury. Patients usually report a sudden onset of pain after a forced dorsiflexion, such as when another player falls onto the back of the foot when the joint is already maximally extended.

On physical exam, the patient walks with an antalgic gait, either externally rotating the lower extremity to avoid dorsiflexion during push-off or walking on the outside of the foot to minimize pressure on the joint. Periarticular swelling and ecchymosis vary according to the severity of the injury. Passive motion at the joint is painful and often stiff for dorsiflexion, plantar flexion, or both. Normal active range of motion of the first MTP joint is from 80° of dorsiflexion to 25° of plantar flexion.

AP, lateral, oblique, and sesamoid radiographs often show no bony abnormalities. However, occasionally a capsular avulsion fracture on the first metatarsal head or proximal phalanx can be identified. Other radiographic findings in more severe injuries include sesamoid bone fracture or intra-articular loose bodies caused by a compression fracture.

Turf toe injuries are classified into three grades. Grade one injuries show plantar or medial tenderness, minimal swelling, no ecchymosis, negative x-rays suggesting a strain or stretch injury to the plantar tendon and ligament complex. Grade two injuries show diffuse tenderness, moderate swelling, ecchymosis, restriction of motion suggesting a torn plantar ligament complex without articular injury. Grade three injuries show severe dorsal tenderness, plantar tenderness considerable swelling, ecchymosis, marked range-of-motion restriction suggesting a completely torn plantar complex with compression injury to dorsal articular surface and may represent a spontaneously reduced dislocation.

TREATMENT
The initial treatment for all grades of turf toe is rest, ice, compression dressings, elevation, and NSAIDs. Additional treatment varies with the grade of injury. Grade one injuries can usually be treated effectively with conservative measures. Patients may continue sports activity if they wear stiff-soled shoes to prevent dorsiflexion beyond 30° during the push-off phase and/or the great toe is taped to prevent dorsiflexion beyond 30°. The joint can be taped with by wrapping several layers of athletic tape from the dorsal surface of the great toe to the plantar surface of the foot. Patients with grade two injuries should refrain from athletic activities for 2 weeks and wear stiff-soled shoes. Alternately, a rigid orthosis should be inserted to limit dorsiflexion of the joint. Grade three injuries require similar protection and restriction of activities for 4-6 weeks. If these conservative measures fail, surgery for plantar capsule repair or loose-body removal may be necessary. A patient’s return to activities should progress gradually from weight
bearing to walking to jogging, using discomfort as a guide. A complete return to play should be permitted only after full-speed running and cutting maneuvers are pain free.

**EXPECTED OUTCOME AND COMPLICATIONS**
Some patients have lasting difficulty with pain and stiffness in the joint. Proper initial treatment is important and with proper care, many patients have full recovery and return to sports without limitations. When problems continue and conservative options fail, surgical options to stabilize the joint, reconstruct the ligaments, remove bone spurs, or even fuse the joint are possible to minimize long term limitations, but do not lead to full recovery and return to high level functions.

**MORE INFORMATION**
Further information can be obtained on the internet. Your local public library can help you explore these sources if you are interested. Two good internet sites for expert and peer reviewed information are the American Academy of Orthopedic Surgeons at [www.aaos.org](http://www.aaos.org) and [www.emedicine.com](http://www.emedicine.com).

**FEEDBACK**
If you have questions or comments, please contact the office or submit them to the web site at [www.pedortho.com](http://www.pedortho.com).