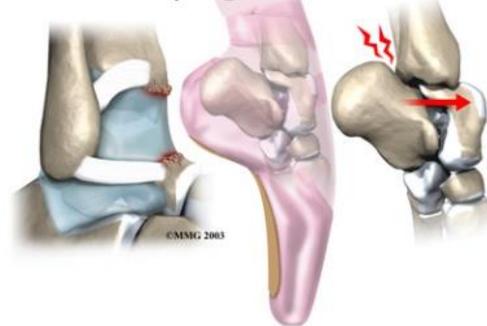




Pedorthic Intervention and Orthotic Design for Patients with Symptomatic Anterior Lateral Ankle Impingement

Ankle Impingement



The role of the Pedorthist is to work collaboratively with the patient's physician to produce conservative yet effective footwear/orthotic intervention for many foot pathologies and/or injuries should surgery or more invasive methods not be required or yet deemed necessary.

Today, I want to focus on a very common complaint I see in my practice. That is, rear-foot Talocalcaneal, sub fibular impingements, usually initiated with sinus tarsi impingements and inflammation.

Anatomy

During the motion of ankle dorsiflexion, the tibia approaches the front of the talus. This places compressive forces on the structures at the front of the ankle joint. If these forces are in excess or beyond what the ankle can withstand, damage and inflammation of these structures can occur.

Regarding Fibular involvement, there are two primary connective tissues involving the anterior impingement relating to the fibula. These are the Anterior/Inferior Talofibular Ligament (AITF) which connects the superior aspect of the talus to the fibula and the Anterior Talofibular (ATF), passing from the anterior margin of the fibular malleolus, anteriorly and medially, to the talus bone, in front of its lateral articular facet.

Continued irritation in the lower edge of the AITFL and the front of the ATFL can thicken these ligaments. The irritated ligaments become vulnerable to getting pinched between the tibia and talus as the foot is dorsiflexed. These ligaments may also begin to rub on the joint capsule of the ankle. This can inflame the synovial lining of the capsule, a condition called *synovitis*. In many cases, a spur also known as an osteophyte can form.

The other relevant anatomy is primary in the articulating joint between the tibia and the calcaneus with articular cartilage serving as a 'cushion' as the two bones slide upon each other. With excessive movement, this cartilage can become inflamed.



This is especially true for athletes who repeatedly bend the ankle upward (dorsiflexion), such as baseball catchers, basketball and football players, and dancers. Over time, irritation along the front edge of the ankle can lead to impingement. Also, athletes and general trauma resulting in several mild ankle sprains or one severe sprain are most likely to have anterior impingement.

Location and Causes

The impingements most commonly occur in the articulating areas inferior and anterior to the lateral malleolus/sinus tarsi, talocrural joint.

These pathologies occur primarily in patients with severe Adult Acquired Flat Foot syndrome, a Pes Planus foot with rear-foot valgus deformity. A recent study of severe flat foot deformity suggested a 92% incidence of first sinus tarsi impingement and a 66% incident of calcaneofibular impingement versus negligible rates for those with no rear foot valgus/flat foot (Malicky ES, et.al 2005). Long term or excessive strain to the Anterior Talo-fibular joint can result in in spurs most commonly in the articulating area inferior to the fibula and the superior edge of the talus.

The impingement in the lateral aspect of the hindfoot may first occur within the sinus tarsi and then involve the calcaneofibular region.

There are many causes of these impingements which range from trauma to excessive mobility of the subtalar joint again due to flat foot deformity. The condition is also common in athletes with sprains resulting in severe inversion of the ankle resulting in sprain. Some other common causes are:

- Adult Acquired Flat Foot Deformity.
- Contributing to AAFF is a patient with excessive weight and/or obesity placing strain on the subtalar joint and Posterior Tibial Tendon.
- A tear of the anterior talofibular ligament that binds the subtalar joint together.
- Long term excessive dorsi-flexion of the subtalar joint (i.e. baseball catcher, dancers).
- Damage to the cartilage of the joint (an osteochondral defect).
- Injury to the subtalar joint, especially where the joint ends up less tightly bound together allowing too much motion to occur.
- Degenerative disease of the subtalar joint (flat foot deformity is an example).
- Long-term inflammation of the soft tissue within the sinus tarsi.

Pedorthic Interventions and Examination

- Stability of the subtalar joint may be initially improved with the use of an orthosis.
- Ankle braces intended for may be useful for some athletes, but the overall design of these braces may not significantly improve the stability of the subtalar joint during athletic activities.
- Foot orthosis have also been recommended as a method for limiting motion at the subtalar joint and reducing symptoms.
- The types of shoes the athlete is using for training, practices, and competition should also be considered, as well constructed shoes can restrict excessive rearfoot movements
- Whether utilizing the traditional Harris Mat or today's digital pressure mapping applications (I prefer the Harris Mat for many reasons), A Harris Mat Impression below can reveal a good deal of compelling information;
- Manual Examination of the foot, tenderness, inflammation, and range of motion.

Footwear Recommendations

- General recommendations for footwear/shoes include:
 - Shoes with a straight last in cases of AFF
 - A Firm heel counter
 - Added Cushioning on inside lateral Topline of the shoe
 - Rigid material through the midsole.
 - Shoes should also be assessed for wear as materials within a shoe beginning to break down before the external material show signs of deterioration.
- Footwear NOT recommended includes:
 - A lateral top-line of a shoe that will interrupt the surface area protecting the anterior/inferior area being affected
 - A neutral or hour glass shaped shoe assuming AFF
 - Lack of cushioning on the topline of the shoe

Orthotic Recommendations and Design

The use of a foot orthosis with an athletic shoe should be considered together with an ongoing assessment of the shoe orthotic, and foot 'marriage' is needed to provide adequate support of the foot and ankle throughout an athlete's cycle of training and competition or any adult with a rearfoot impingement.

With the assumption of the impingement cause primarily being AFF, the following orthotic design should be considered:

- A Moderate to low heel cup
- Medial and lateral heel flanges extended to mid-shaft of the 1st and 5th metatarsal
- Trim lime to eliminate direct pressure of the bursa at styloid process or proximal base of 5th metatarsal bone.
- 1st MTH Cutout to potentially enhance Peroneal Function
- Large Medial Skive
- Medial forefoot and rearfoot Posting
- Semi Rigid to Rigid Materials
- Mid-tarsal Support
- These fabrication methods will reduce pronation, better control the subtalar joint and provide more space through the sinus tarsi area.

For more information or to discuss how our practice can be off assistance to you and your patience, please call: 954.773.4850 -or- email: rob@own2feet.care web-site: www.own2feet.care

Until next time!

Rob

