What's Afoot

Chronic Inversion Sprain

by L.A. Sidari, Podiatrist

This patient presents to the clinic with a history of recurrent ankle sprain. The patient feels that the foot is laterally unstable even when only walking. When running and turning the problem appears to be worse. It is not always painful but when the ankle is twisted swelling can occur.

Biomechanical Examination Tips

The most common foot type susceptible to this injury is the Cavus (high arch) foot type with a rigid plantarflexed 1st ray or forefoot valgus or a high rearfoot varus. Lateral ankle sprain is one of the most common ankle injuries among sportsmen and women. For the purposes of this article we will confine ourselves to a foot with a rigid forefoot valgus of 6 degrees and greater.

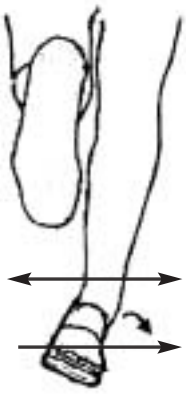

Figure 1: *Inversion Sprain Mechanism*

On examination of a foot with a forefoot valgus you will note that the 1st metatarsal is plantarflexed (lower) than the plane of the lesser metatarsals, you may see the hallux "trigger" with contraction deformity or a bulge on the medial side of the 1st metatarsophalangeal joint or big toe joint.

The patient is placed in a prone position with the foot hanging free, the subtalar joint is placed in neutral and then the degree of forefoot valgus can be measured *(see Figure 2).*

During propulsion, the centre of gravity must be shifted toward the opposite foot. In a foot with a forefoot valgus deformity, the rearfoot must first invert to pronate the midtarsal joint, around its longitudinal axis before propulsion can occur. Propulsion is thus delayed and lateral postural instability occurs.

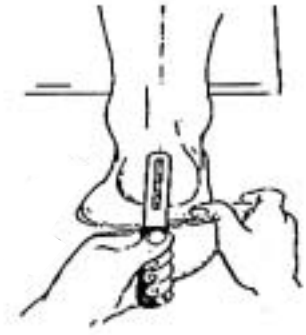

Figure 2. *Measurement of Forefoot Valgus*

In this case the patient is complaining of mild discomfort and occasional swelling after activity. It is probable that this is repetitive strain or overstretching of the ligament without disruption to the integrity of its fibres.

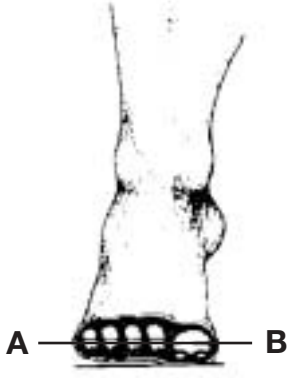

Figure 3: *Inverted rearfoot at heel off too early - forefoot everted relative to the neutral subtalar position leads to lack of stability at position A.*

The patient often states "now every time I walk on a pebble I go over my ankle" - this is a sure sign of lack of proprioception and will need re-education of muscle and balance. ***(cont'd on page 2)***

VASYLI

Chronic Inversion Sprain - cont'd

Differential Diagnosis is also important as fractures and other problems eliciting lateral ankle instability and pain may be treated differently so if you are in doubt use the rest padding and refer on to the appropriate specialist.

Treatment Suggestions

The main consideration is to reduce the stress and inflammation to the area, this is done by resting the area either by taping or using rest padding. If the symptoms are severe keep the area non weight bearing, the use of ICE to reduce inflammation, massaging in an anti-inflammatory gel or the use of local injection of non-steroidal anti-inflammatory agents.

Figure 4: *Place an Ice Pack on ankle and elevate.*

Mechanically, we need to reduce the stress on the ankle and reinstate the efficiency of the lateral ligaments especially through propulsion, this can be done by forefoot valgus padding and taping, AOL or VASYLI functional orthoses or a combination of all modalities.

1. If a forefoot valgus or plantar flexed 1st Ray are present then correction must be placed under the lesser metatarsals, this may consist of felt padding or appropriate posting of the correct angle from the 1st to the fifth metatarsal heads on a mouldable or other form of orthoses.

Figure 5: *Posting a device*

Figure 6:

2. Using padding on the foot, you place either a felt or genlite wedge pad of 3 - 6 degrees depending on the degree of deformity from the 1st through to 5th met heads and tape it in place, this padding can then also be incorporated with an ankle stabilising taping method if either is not enough on its own (ie: Stirrup tape for the ankle).

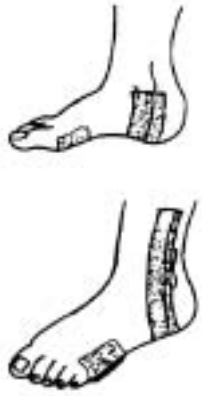

Figure 7: *Use of strapping with padding*

3. If the ankle instability is severe then strapping the ankle and foot is important until some of the integrity is returned to ligamentous structures - this could take a few weeks.

Once the structural integrity has returned then the orthoses should be able to control the osseous malalignment of the forefoot to allow normal function.

Remember that these modalities should be used in conjunction with normal anti-inflammatory treatment and exercise programs and not on their own for best results. #