

Effects of a Custom-Fit Orthosis for Plantar Fasciitis

Physical Therapists are front and center in the nonsurgical treatment of plantar fasciitis, a painful foot condition that affects 10 per cent of all Americans at some time in their lives. With an estimated one million patient visits to physicians each year in the United States for this painful condition, finding effective treatment strategies has become an important research goal.

One of those treatments is the use of a custom made foot orthosis. That's the focus of this study. An orthosis is a molded piece of plastic that is made to fit each individual's foot. It is worn inside the shoe with the express purpose of taking weight off the plantar fascia while standing and walking (i.e., during weight-bearing).

The plantar fascia is a thick band of connective tissue that goes from the base of the heel to the base of each toe. It actually forms an arch the length of the foot and provides needed support during all weight-bearing activities.

What goes wrong that so many people suffer from this problem? Our understanding and thinking about plantar fasciitis has changed over the years as new studies examine the tissue more closely. Instead of active inflammation, scientists report this condition is actually more of a degenerative problem.

There probably isn't one single reason why someone starts to develop heel and foot pain from plantar fasciitis. Foot and ankle alignment certainly seem to head up the list of "reasons why I have plantar fasciitis." For example, a flat foot with no arch or a naturally high arch that is not properly supported is commonly present in patients with plantar fasciitis.

Other risk factors that may contribute to the problem include being overweight, weak plantar flexor muscles, limited ankle dorsiflexion (movement of the foot toward the face), trauma, and deformity or alignment issues in other areas of the ankle and/or foot.

Likewise, there doesn't appear to be one individual way to treat this problem successfully with each patient. Treatment options range anywhere from stretching, taping, and manual therapy to electrical therapy, steroid injections, and surgery. The idea to use splinting or bracing (orthotics) is not new either.

The authors of this study combined the temporary use of a custom foot orthosis with stretching to see how well these two treatment tools work. Patients included in the study had heel pain that was the worst when getting up after resting or inactivity. This symptom called first-step pain is typical of plantar fasciitis.

No one in the study had been treated with any other approach before trying this plan of temporary orthosis and stretching. Everyone was examined closely and measures of motion for the low back, hip, knee, ankle, and foot were taken. Clinical tests for plantar fascia problems (e.g., palpation, Windlass test) were also conducted and results recorded.

A physical therapist made the special orthotic for each patient in the study. The insert was designed to put the foot in a toe-down (plantar flexed) position with the toes turned in slightly (inversion). The goal was to take pressure off the plantar fascia during weight-bearing activities.

The orthotic was worn everyday for two weeks whenever in a standing or weight-bearing position. At the end of two weeks, a twice-daily stretching program was started. The stretches were specific to the plantar fascia, calf muscles, and ankle joint.

Patients were re-evaluated and weaned off the orthotics as symptoms improved. The therapist reheated the plastic molded orthotic and reshaped it to lower the heel as the painful symptoms decreased. Once the patient was completely orthotic-free, then a supportive shoe was recommended.

Everyone was followed for a full 12 weeks. The results showed that this type of program with temporary use of a foot orthotic followed by soft tissue stretching was quite successful in reducing foot pain from plantar fasciitis.

By the end of the first two weeks, 80 per cent of the group had a significant improvement in pain. There was an equally big change in function of the lower leg during daily activities and sports participation. Improvements were maintained through to the end of the study.

The authors suggest that the use of the orthotic as the only treatment worked for one of several reasons. First, just getting pressure off the plantar fascia and allowing it time to heal without repeated microtearing was important. Second, having the insert in contact with the foot may have helped reduce pain by changing sensory input to the brain.

It is also possible that transferring the load and pressure during weight-bearing from the heel to the forefoot helped reduce the pull on the plantar fascia. Again, this could prevent trauma to the fascia allowing healing to take place.

There are still many unanswered questions from a study like this. For example, was the stretching really needed? The idea behind stretching is that it allows the soft tissues to return to their normal length. By remaining flexible, it may be possible to prevent recurrence of the problem. The long-term effects of this program remain unknown as well.

The authors point out these and other limitations of their own study. They suggest using a temporary foot orthosis is a good place to get started in the treatment of plantar fasciitis. It is noninvasive, provides early relief of symptoms, and improves leg function quickly.

Reference: Michelle Drake, DPT, et al. The Short-Term Effects of Treating Plantar Fasciitis with a Temporary Custom Foot Orthosis and Stretching. In *The Journal of Orthopaedic & Sports Physical Therapy*. April 2011. Vol. 41. No. 4. Pp. 221-231.