

Gait Style as an Etiology to Chronic Postural Pain

Part I. Functional Hallux Limitus

HOWARD J. DANANBERG, DPM*

A common, but locally asymptomatic and therefore rarely recognized functional inability of the first metatarsophalangeal joint to dorsiflex strictly during gait is described. Normal motion is present in this joint during nonweight-bearing examination; therefore this is referred to as functional hallux limitus. Since this joint forms the pivot about which the entire body advances during each step, this disturbance in function, when repeated thousands of times on a daily basis, can alter foot and postural biomechanics. It can cause and perpetuate many chronic postural ailments, including lower back pain. When functional hallux limitus is specifically addressed in an orthotic treatment plan, 77% of long-term chronic postural pain patients exhibit 50% to 100% improvement in their overall condition, in spite of failing previous therapy on their specific site of pain and never exhibiting any foot symptomatology.

In 1990, DiNapoli et al¹ published the results of a randomized, retrospective study. This project examined the effects of objectively fabricated foot orthoses on patients with chronic postural symptoms, eg, lower back pain, knee arthritis, temporomandibular joint dysfunction syndrome, and myogenic headaches. Patients were selected based on the following criteria. They had to have had chronic symptoms for more than 1 year; most were of at least 3 to 5 years' duration. None had complaints of foot symptoms, although all were examined and found to have an entity known as functional hallux limitus. All had been previously examined by either family doctors or specialists, and 34% had undergone extensive therapy including surgery, which had been unsuccessful.

Thirty patients who fit the specific criteria required were selected for this study. Twenty were then selected at random and used for the review. All had been examined by the Electrodynamogram System^{®1} and underwent a process where test foot orthoses were fitted, then adjusted according to the Electrodynamogram System examination findings. Re-examination was continued until suitable Electro-

dynamogram system analysis was obtained. All testing was performed in a single session. Once completed, the test orthosis served as a template for the fabrication of a permanent orthosis designed with the Kinetic Wedge^{®2}. The Kinetic Wedge is a device that promotes plantarflexion and eversion of the first metatarsal during the peak stress point during the step. This is designed to prevent the formation of functional hallux limitus and its eventual sequelae.

In a follow-up interview done 2 years after the initial orthoses were dispensed, the results of this treatment were evaluated. Seventy-seven percent of the patients reported that their postural symptoms were at least 50% to 100% improved by the use of the orthoses. Twenty-three percent were 25% to 50% improved. None were worse and all continued to use their orthotic devices. All related increased activity levels with decreased symptoms related to the use of their orthotic devices (Fig. 1).

Functional hallux limitus is an entity that has been previously described.³ In order to explain it in context with chronic postural complaints, it is best broken down into two elements: focal and global.