Overview - Tarsal tunnel syndrome

Tarsal tunnel syndrome is caused by the entrapment of the tibial nerve.

The tibial nerve follows a curving route down the back of the leg to the ankle, where it turns and curls below the inside of the ankle. There are four compartments in this region. In three of them, muscles are routed from the leg to the foot. In the fourth, the tibial nerve and the posterior tibial vein and artery are surrounded by muscles.

Along the top of these structures lies the laciniate ligament, which forms the roof of the four compartments. There is little room for expansion if any of these structures becomes enlarged or if a foreign object intrudes into the area. If anything impinges on the space occupied by the tibial nerve (i.e., the tarsal tunnel), entrapment occurs.

Signs and Symptoms

When entrapment compresses the nerve, it causes pain, a burning sensation, and tingling on the sole of the foot. This pain usually worsens as the day progresses and can usually be relieved by rest, elevation, or massage.

Causes

Tarsal tunnel syndrome is most common in active adults, but it can also occur in children. The burning or tingling sensation it causes is a function of the compressed tibial nerve attempting to send signals between the foot and brain. An analogy can be made between the nerve and a garden hose. If a hose is drawn around a sharp corner, tension is created at the point of the bend. If the hose is pulled even tighter, it kinks and the flow of water through it is restricted. If the hose is stepped on, the flow is reduced even further.

In tarsal tunnel syndrome, the same types of forces are applied to the tibial nerve. When it is compressed by another structure, the neurological impulses through it are restricted. This causes pain, a burning sensation, and tingling. In many cases, the compression is caused by an adjacent muscle that grows too large for the area or from scar tissue that forms.

People with exceptionally flatfeet can develop tarsal tunnel syndrome because the flattened arch causes strain on the muscles and nerves around the ankle and changes their route slightly, producing compression on the tibial nerve.

In other cases, compression results from a cyst in this area. Systemic diseases such as **rheumatoid arthritis** and **diabetes** also can cause the syndrome.

Another common cause is trauma to the ankle, such as a fracture. When the injury heals, fibrous tissue, similar to a scar develops. If too much scar tissue forms, it can restrict movement in the tarsal tunnel and cause entrapment of the nerve.

Treatment

Conservative treatment such as **arch supports** and **wider shoes** may successfully relieve the discomfort of tarsal tunnel syndrome. If inflammation of the nerve is causing the compression, **nonsteroidal anti-inflammatory drugs** (NSAIDs) may be prescribed.

Due to potentially significant gastrointestinal and cardiovascular **side effects**, NSAIDs should only be used as instructed.

Steroid injections also may prove effective, although care must be taken during administration to avoid injury to the vein and artery. If the problem is caused by flat feet, custom **orthotics** can help restore the foot's natural arch (see Orthotics).

If conservative treatment measures are unsuccessful, surgical treatment may be necessary. An incision is made behind and below the inside of the ankle and the surgeon cuts the laciniate ligament, providing room for expansion of the nerve. If a cyst is impinging on the nerve, it can be removed. This procedure typically provides enough space to prevent the nerve from being compressed.