



*Dynamic Chiropractic* – September 1, 1995, Vol. 13, Issue 18

## **Peripheral Nerve Entrapment Syndromes Often Seen in a Sports Injury Practice**

### **Part II: Lower Extremity**

By David BenEliyahu

Editor's Note: Part I of Dr. BenEliyahu's article appeared in the July 17th issue.

In review, entrapment neuropathies have some common features: pain is usually ever present and can be severe at night or after exertional activity; there is often retrograde pain distribution; and the nerve trunks are tender both proximal and distal to the lesion site.

#### **Peroneal Nerve**

The peroneal nerve may be injured or entrapped at the knee due to injury at the fibular neck. This may be an acute compression injury causing neuropraxia. It may be due to fracture, tight casts, or a forcible inversion injury of the ankle causing a stretch injury to the nerve. It may be due to repetitive microtrauma like in occupations requiring squatting, as well as compressive phenomena from ganglionic cysts or tumors. There are two branches of the peroneal nerve: the deep peroneal nerve, and the superficial peroneal nerve, and either may be involved. The superficial nerve can cause pain over the lateral leg and ankle. The deep peroneal nerve may be entrapped at the "anterior tarsal tunnel," under the inferior extensor retinaculum, or the tendon of the extensor hallucis brevis. Osteophytes at the talonavicular joint may also contribute to entrapment. Typically recurrent ankle sprains play a role in deep peroneal nerve entrapments. Superficial peroneal nerve entrapments may occur distally as it exits the deep fascia in a short fibrous tunnel. Again this seems to occur in athletes who have had chronic repetitive ankle sprains subjecting the nerve to stretch injury.

## **Sural Nerve Entrapment**

Entrapment of the sural nerve may be seen in runners, especially those with a history of repetitive ankle sprains leading to fibrosis and subsequent entrapment. The patient will often complain of lateral ankle/foot pain with shooting pain and paresthesias. Sensory hypoesthesia and a positive Tinel's sign is often seen. In the May 1995 issue of *Chiropractic Sports Medicine*, I reported on a case of a runner/hurdler who had developed tingling of the lateral foot. Subsequent electrodiagnostic testing with nerve conduction and evoked potentials revealed evidence of sural nerve entrapment. After a short period of chiropractic sports medicine (i.e., soft-tissue and manipulative therapy), post-treatment electrodiagnostic testing revealed a normalization of latencies and amplitudes.

## **Tarsal Tunnel Syndrome**

There are two types of tarsal tunnel syndrome (TTS): anterior and posterior TTS. In posterior TTS the posterior tibial nerve is entrapped at the medial malleolus. In anterior TTS, the deep peroneal nerve is entrapped as described earlier. The patient will often complain of pain and sensory loss in the dorsal foot. In posterior TTS, there is often pain and burning at the sole of the foot. Many patients find that the pain is worse at night, or when they rest after a period of activity. Sensory loss may be seen at the plantar surface of the foot, with a positive Tinel's sign at the medial malleolus, and weakness of the intrinsic foot muscles. Etiologies may include sprains, fractures dislocation, and foot hypermobility. Polyneuropathy may also contribute to the development of the TTS (i.e., diabetes mellitus) by a "double crush" type of mechanism that is also seen with carpal tunnel syndromes.

## **Sciatic Nerve**

In about 10 percent of the population the sciatic nerve pass through the two bellies of the piriformis muscle and may cause a sciatic nerve entrapment often termed the "piriformis syndrome." The sciatic nerve may also get entrapped in some cases in a myofascial band between the biceps femoris m. and the adductor magnus m. Soft tissue techniques such as "active release" can help reduce myofascial entrapments.

## **Interdigital Neuromas**

This involves interdigital nerve entrapment at the metatarsals. The athlete will often complain of burning pain over the involved metatarsal head with radiation to the toes. It is exacerbated by prolonged standing and walking. The etiology may be traumatic such as seen in runners and joggers, or from repetitive use of

high heels altering foot biomechanics, or from foot posture alterations such as hyperpronation. Conservative chiropractic care with foot orthotic prescription are often helpful. Due to mechanical irritation of the interdigital nerve there are fibrotic changes around the nerve with swelling and cystic changes, this has sometimes been called a Morton's neuroma. If conservative care fails, podiatric surgery may become necessary.

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