A Unique Case of Common Peroneal Nerve Entrapment

RICHARD J. MYERS, MD; ELIZABETH E. MURDOCK, MS; MEHWISH FAROOQI, BS; GRACE VAN NESS, MPH; DENNIS C. CRAWFORD, MD, PHD

abstract

The authors present a case of a previously healthy 36-year-old man with a 3-day history of spontaneous complete right lower extremity foot drop. He noticed the symptoms immediately when he attempted to stand after waking from sleep. The patient had no history of similar symptoms, recent trauma, or peripheral nerve disease. Physical examination showed a slap foot gait, complete numbness of the lateral leg and dorsal foot, and 0/5 strength with ankle and great toe dorsiflexion and ankle eversion. Serum laboratory studies showed normal values. Nerve conduction studies confirmed increased latency and decreased amplitude of the right peroneal nerve at the knee, whereas electromyography showed denervation of the tibialis anterior and extensor digitorum brevis. Anteroposterior and lateral radiographs showed a normal right knee with the exception of a posterior fibular neck exostosis. Physical therapy, an ankle-foot orthosis, and a 5-day course of oral prednisone burst (50 mg) were prescribed. After 1 month of therapy without resolution, the patient underwent surgical release of the common peroneal nerve and excision of the bony prominence. Twelve days postoperatively, the patient had no sensory improvements but had improved findings on motor examination. Three months postoperatively, the patient had near-normal sensation to light touch in the superficial and deep peroneal nerves, with 5/5 strength and a normal gait. The patient returned to all activity without limitations. The authors present this unique case describing a fibro-osseous source of common peroneal compressive neuropathy and review the literature for spontaneous peroneal entrapment, highlighting the importance of prompt diagnosis and treatment. [Orthopedics. 2015; 38(7):e644-e646.]
Peroneal neuropathy, the most common compressive neuropathy in the lower extremity, may be largely underdiagnosed because of unfamiliarity with peroneal entrapment or the lack of obvious sources of compression. Prompt assessment of peroneal neuropathy is essential because delays in diagnosis and treatment are associated with poor long-term outcomes. Unfortunately, many clinicians are unaware of less common causes of this condition. To the authors’ knowledge, there is no previous description of a focal fibro-osseous band implicated in this pathologic process. This article describes a unique fibro-osseous source of common peroneal compressive neuropathy and discusses appropriate diagnosis and treatment.

**CASE REPORT**

A previously healthy 36-year-old man presented with a 3-day history of complete right lower extremity foot drop. The patient noticed the symptoms spontaneously on awakening and attempting to stand. He had no history of similar symptoms, recent trauma, or peripheral nerve disease.

Examination showed a slap foot gait, complete and painless anesthesia in the lateral leg and dorsal foot, and 0/5 strength with ankle and great toe dorsiflexion and ankle eversion. Serum laboratory findings were unremarkable. Nerve conduction studies confirmed increased latency and decreased amplitude of the right peroneal nerve at the knee, whereas electromyography showed denervation of the tibialis anterior and extensor digitorum brevis. Lateral (Figure 1A) and anteroposterior (Figure 1B) radiographs showed a normal right knee with the exception of a posterior fibular neck exostosis. Physical therapy, an ankle-foot orthosis, and a short course of oral prednisone burst (50 mg daily for 5 days) were prescribed.

After 1 month, there was no improvement with therapy, and surgical release of the common peroneal nerve (neurolysis) and fibular neck exostectomy were recommended. During neurolysis, the fascia was freed carefully from the nerve over a 10-cm extent. A remarkable discrete, thickened fascial band arising from the exostosis was observed to be causing compression of the nerve. This band ran from the fibular metaphysis proximally to the myotendinous aspect of the biceps femoris, somewhat analogous to the ligament of Struthers in the arm (Figure 2). The band was divided, freeing the nerve entirely.

On examination 12 days postoperatively, the patient had no improvements to sensory deficits but had improved findings on motor examination, grade 3/5 in the tibialis anterior, extensor hallucis longus, and peroneal muscles. On examination 3 months postoperatively, the patient had near-normal sensation to light touch in the superficial and deep peroneal nerves, with 5/5 strength and a normal gait. The patient returned to all activity without limitations.

**DISCUSSION**

The peroneal (fibular) nerve is among the most common nerves at risk for lower extremity entrapment and the third most frequent cause of focal neuropathy. Pickett estimated that the overall prevalence of peroneal nerve lesions was 1.7%, based on a series of 36 lesions in 2075 patients undergoing nerve conduction studies for all causes. Cho et al reported that 16% of their operative series of sports injury-related peroneal nerve lesions were...
caused by entrapment or compression of the nerve and reported that a large proportion of the injuries were either caused by overuse or had idiopathic origins.

Diagnosis of peroneal neuropathy is based on the characteristics of motor and sensory abnormalities, patient history, and physical examination. Affected patients show a steppage gait pattern in which the affected foot is lifted excessively from the ground during the swing phase to clear the foot from tripping, consistent with “foot drop.” A foot slap may be heard because the ankle dorsiflexors cannot control foot descent. Typically, symptoms of foot drop occur in a more chronic setting. However, in rare cases (eg, this index case), this may be the presenting symptom. Magnetic resonance imaging is often used to show compressive soft tissue (eg, ganglion or meniscal cysts) abutting the nerves. Electromyography and nerve conduction studies should be performed bilaterally for comparison and may be helpful in confirming the diagnosis and determining the severity of entrapment.

Treatment depends on the site and etiology of injury. Conservative treatment includes rest, anti-inflammatory medications, orthotics, and physical therapy. Contusion of the common peroneal nerve caused by blunt trauma can have functional recovery within days or weeks with minimal treatment. However, nontraumatic entrapments often require surgery.

As with many peripheral mononeuropathies, several soft tissue sites are implicated in compression. These include the lateral side of the popliteal fossa medial to the tendon of the biceps femoris, a fibrous band on the surface of the deep head of the peroneus longus, and the confluence of the origins of the soleus and peroneus longus muscles. In contrast to soft tissue compression, the fibula can be involved as a result of bone lesions, fractures, benign tibiofibular joint cysts, tumors, and osteophytes.

According to the literature, decompression is effective. Humphreys et al reported that 83% of patients who had preoperative motor weakness improved after surgery, and 49% of patients who had sensory disturbances and 84% of patients who had preoperative pain also showed improvement. Additionally, operative decompression can be very effective for combined motor and sensory deficits. Fabre et al examined 60 patients who were treated with operative decompression. Of these patients, 38 had both motor and sensory changes and 87% (33 patients) had a good or excellent result after surgical decompression.

Although common fibular nerve entrapment is the most prevalent entrapment neuropathy of the lower extremity, misdiagnosis because of a lack of clear symptoms, inconsistency of diagnostic tests, and a limited role for imaging studies suggests that prompt and accurate recognition requires a high level of suspicion. Delay in the diagnosis and treatment of peroneal neuropathy is associated with poor long-term recovery. Therefore, prompt assessment of the clinical syndrome is essential. In cases of mechanical compression, open neurolysis is often effective in relieving symptoms, although it may not provide complete relief in chronic cases.

References