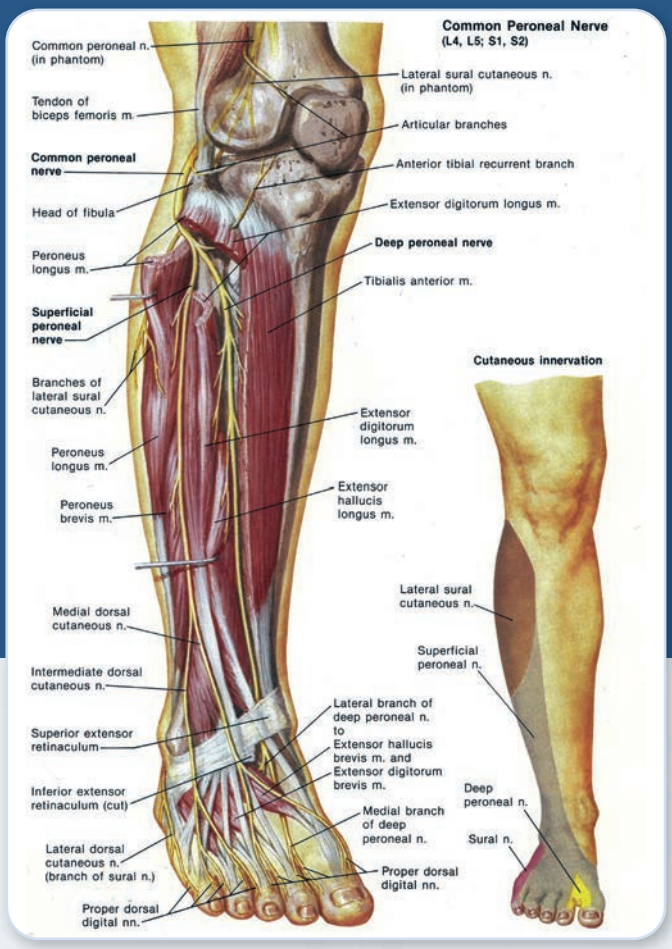
EMG LABORATORY
"COMMITTED TO EXCELLENCE IN NEURODIAGNOSTICS"

DRASKO SIMOVIC, M.D.

Peroneal Nerve Mononeuropathy

*The **peroneal nerve** (PN), also known as the **fibular nerve,** is one of the major branches of the sciatic nerve. Its nerve roots arise from the L4, L5, S1, and S2 to enter the **sciatic nerve,** which branches to the tibial and peroneal nerve in the popliteal fossa. PN then wraps around the bony prominence of the fibula – it becomes superficial at this place and, thus, prone to compression. Peroneal mononeuropathy is the most common cause of pain and sensory disturbances in the lateral lower limb and dorsal foot and weakness of the ankle dorsiflexors and evertors.*



Common Pathologies & Symptoms

Peroneal Nerve Compression

The most common issue and severity of symptoms would depend on compression severity. Compression causes myelin loss and thus slows nerve conduction. Severe compression may cause a complete conduction block. Symptoms of PN compression are:

- The hallmark symptom of peroneal nerve compression is **foot drop**, which is the inability to lift the foot and toes upward. This results in a characteristic dragging of the foot while walking.
- Patients may experience **numbness, tingling,** or a "pins and needles" sensation in the top of the foot or the front of the shin.
- **Weakness** in the muscles responsible for dorsiflexion and toe extension can occur, leading to difficulties in controlling the foot and toes.

The most common causes of PN compression are habitual leg crossing, repetitive strain injury (like kicking), knee dislocation, compartment syndrome, loss of fat pad over fibular head due to weight loss, anabolic steroid use, short cast, operative trauma and more.

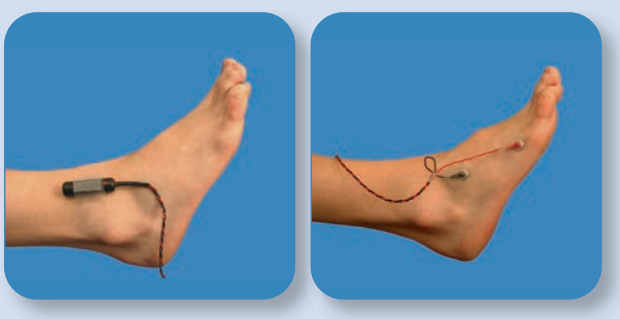
Trauma or Ischemic Injury may result in axonal damage; recovery is slower and longer and may not be complete. Symptoms of the condition would be similar to compression but more severe.

Medical Conditions can affect the peroneal nerve, including diabetes, vasculitis, neurosarcoidosis, SLE, mononeuritis multiplex, or masses. Symptoms may include numbness, weakness, and pain in the affected leg. Idiopathic PN mononeuropathy is not rare. In such cases, the cause remains unidentified.

Diagnostic approach

Patients report both motor and sensory symptoms. Hence, in PN mononeuropathy, patients experience frequent tripping due to a foot drop. Night cramps may occur in the anterior lower leg early in the course. Sensory disturbances (e.g., tingling, numbness) in the lateral lower leg and foot may be noted.

Foot weakness to complete foot drop that spares plantar flexion and foot inversion is noted (unlike in lumbosacral radiculopathy, plexopathy or sciatic neuropathy). Tapping of the nerve at the fibular head may produce pain and tingling in the peroneal sensory nerve distribution.



CAPE COD
51 Main Street #6
Hyannis, MA 02601
Tel: 508-775-2600

DRASKO SIMOVIC, M.D.
Board Certified in: Neurology, Clinical Neurophysiology, Electrodiagnostic Medicine, Disability Analysis

LAWRENCE
25 Marston Street #208
Lawrence, MA 01841
Tel: 978-687-2586

Role of Electrodiagnostic Testing

Nerve conduction studies and needle EMG aid in defining the location and type of lesion.

PN abnormalities:

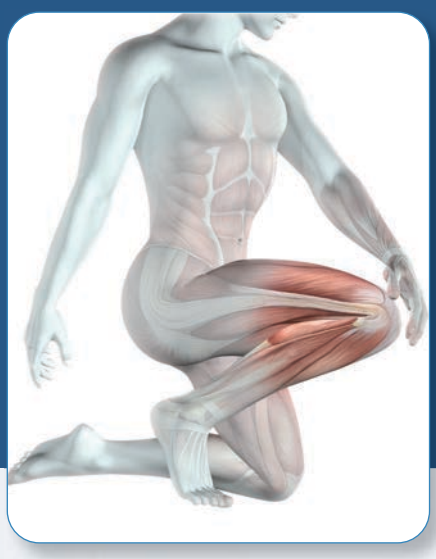
- If the lesion is at the knee, then conduction block or, less commonly, conduction velocity slowing over that segment of the nerve should be documented.
- When an axonal loss occurs in direct nerve trauma or with long-standing compression, a small compound muscle action potential may be noted.

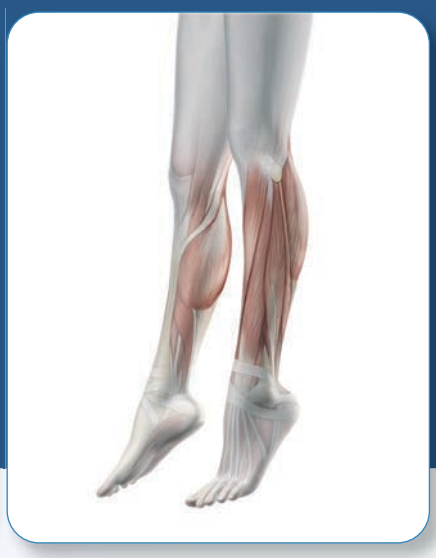
Lesion localization:

- It can be helpful in determining which nerve is involved primarily—the common peroneal nerve at the knee or one of its two branches, the superficial or deep peroneal nerve.
- The tibialis anterior or extensor hallucis longus muscles (i.e., innervated by the deep peroneal) and the peroneus longus or brevis muscles (i.e., innervated by the superficial peroneal) are useful to study for this purpose.

EMG aids differential diagnosis:

- EMG is also helpful in determining if the foot drop is due to an L5 radiculopathy or a sciatic lesion. In L5 radiculopathy, the tibialis posterior, which is a foot inverter, and the lumbosacral paraspinous muscles are involved.
- Involvement of the peroneal division of the sciatic nerve in the thigh or hip area is more difficult to determine clinically. In the thigh, the peroneal division of the sciatic nerve innervates the short head of the biceps femoris muscle, a knee flexor. As isolating this muscle clinically is difficult, EMG may be necessary to determine involvement.





Outcomes & prognosis

It depends on several factors, including the underlying cause and the severity of nerve damage:

- Traumatic injury may have a better prognosis, if promptly addressed, than chronic nerve injury due to underlying health conditions.
- In cases of mild damage, there may be a better chance of recovery, while severe damage may lead to long-lasting or permanent deficits.
- Prompt medical attention and pinpoint diagnosis like that by using EMG can prevent further damage and improve the chances of nerve recovery.

Many individuals may experience lingering symptoms after treatment. Physical therapy and rehabilitation can play a crucial role in improving outcomes.

Treatment approach

Non-pharmacological approach

Most peroneal nerve lesions respond to conservative management with rest and elimination of triggering factors such as leg crossing. Physical therapy is helpful in the recovery of function. Some individuals may benefit from splints and braces for foot and ankle support.

Pharmacological approach

Many individuals require treatment for neuropathic pain. Some of the options include antiepileptics, selective serotonin reuptake inhibitors, and μ-receptor agonists.

These medications only provide symptomatic relief. Hence, it is vital to manage the underlying causes like diabetes.

Surgical intervention

In cases of severe injury, nerve entrapment, or tumors compressing the peroneal nerve, surgery may be required to release the nerve or remove the source of compression.

Literature:

Kimura J. in: *Electrodiagnosis in Diseases of Nerve and Muscle*
Daube J. in: *Clinical Neurophysiology*
Brown W., Bolton C. and Aminoff M. in: *Neuromuscular Function and Disease*
Mendel J., Kissel J. and Cornblath D. in: *Diagnosis and Management of Peripheral Nerve Disorders*

Newsletter courtesy of:
EMG Laboratory
Drasko Simovic, M.D.
Lawrence: 978-687-2486
Hyannis: 978-775-2600
www.emglaboratory.com
Comments or suggestions?
info@emglaboratory.com