

Morton's Neuroma

<http://www.podiatrychannel.com/mortonneuroma/>

Morton's neuroma is an enlarged nerve that usually occurs in the third interspace, between the third and fourth toes. To understand why this occurs, it is helpful to look at the anatomy of the foot (see [Anatomy of the Foot and Ankle](#)).



Morton's Neuroma

Click on the image to view a larger version.

Problems often develop in this area because part of the lateral plantar nerve combines with part of the medial plantar nerve here. When the two nerves combine, they are typically larger in diameter than those going to the other toes. Also, the nerve lies in subcutaneous tissue, just above the fat pad of the foot, close to an artery and vein. Above the nerve is a structure called the deep transverse metatarsal ligament. This ligament is very strong, holds the metatarsal bones together, and creates the ceiling of the nerve compartment. The ground pushes up on the enlarged nerve with each step and the deep transverse metatarsal ligament pushes down. This causes **compression** in a confined space.

The reason the nerve enlarges has not been determined. **Flat feet** can cause the nerve to be pulled more medially than normal, which can cause irritation and possibly enlargement of the nerve. The syndrome is more common in women than men, possibly because women wear confining shoes more often. **High heels** cause more weight to be transferred to the front of the foot and **tight toe boxes** create lateral compression. As a result, there is more force being applied in the area and the nerve compartment is squeezed on all sides. Under such conditions, even a minimal enlargement in the nerve can elicit pain.

Symptoms

The most common symptom of Morton's neuroma is **localized pain** in the third interspace between the third and fourth toes. It can be sharp or dull, and is worsened by wearing shoes and by walking. Pain usually is less severe when the foot is not bearing weight.

Diagnosis

Morton's neuroma is the most common cause of localized pain in the third interspace and these diagnostic tests produce good indications of the condition. It is also important to rule out other, potentially serious, problems.

The podiatrist commonly **palpates** the area to elicit pain, squeezing the toes from the side. Next he or she may try to feel the neuroma by pressing a thumb into the third interspace. The podiatrist then tries to elicit **Mulder's sign**, holding the patient's first, second, and third metatarsal heads with one hand and the fourth and fifth metatarsal

heads in the other and pushing half the foot up and half the foot down slightly. In many cases of Morton's neuroma, this causes an audible click, known as Muldor's sign.

An **x-ray** should be taken to ensure that there is not a fracture. X-rays also can be used to examine the joints and bone density, ruling out arthritis (particularly rheumatoid arthritis and osteoarthritis).

An **MRI** (magnetic resonance imaging) is used to ensure that the compression is not caused by a tumor in the foot. An MRI also determines the size of the neuroma and whether the syndrome should be treated conservatively or aggressively. If surgery is indicated, the podiatrist can determine how much of the nerve must be resected. This is important, because different surgical techniques can be used, depending on the size and the position of the neuroma. Because MRIs are expensive, some insurance companies are reluctant to pay for them. If the podiatrist believes an MRI is necessary, he or she can persuade the insurance company to pay for it by presenting data to support the recommendation.

Treatment

In most cases, initial treatment consists of padding and taping to disperse weight away from the neuroma. If the patient has flat feet, an **arch support** is incorporated. The patient is instructed to wear shoes with **wide toe boxes** and avoid shoes with high heels. An injection of **local anesthetic** to relieve pain and a **corticosteroid** to reduce inflammation may be administered. The patient is advised to return in a week or 2 to monitor progress. If the pain has been relieved, the neuroma is probably small and caused by the structure of the patient's foot and the type of shoes the patient wears. It can be relieved by a custom-fitted **orthotic** that helps maintain the foot in a better position.

Conservative treatment does not work for most patients and minor surgery usually is necessary. Two surgical procedures are available. The **dorsal** approach involves making an incision on the top of the foot. This approach permits the patient to walk soon after surgery because the stitches are not on the weight-bearing side of the foot. The podiatrist maneuvers the instruments carefully through many structures and cuts the deep transverse metatarsal ligament, which typically causes most of the nerve compression. This procedure can lead to instability in the forefoot that may require attention in the future.

The second procedure involves a **plantar** approach, in which the incision is made on the sole of the foot. The patient must use crutches for about 3 weeks and the scar that forms can make walking uncomfortable. The advantage of the plantar approach is that the neuroma can be reached easily and resected without cutting any structures.

Surgical Complications

The surgical area contains very small blood vessels, nerves, and muscles and complications can occur. Once the neuroma is removed, the empty space may fill with blood, resulting in a painful **hematoma**. There is a risk for infection, necessitating careful monitoring by the podiatrist and patient. If the incision site becomes **warm or red** within a day or two after surgery, or if the patient runs a **fever**, the surgeon must be contacted immediately.

Recurrence is another possibility. The stump of nerve remaining after resection can begin to grow again. If this occurs, the nerve grows in width and length, creating a burning pain that can be treated by injection or further surgery.