

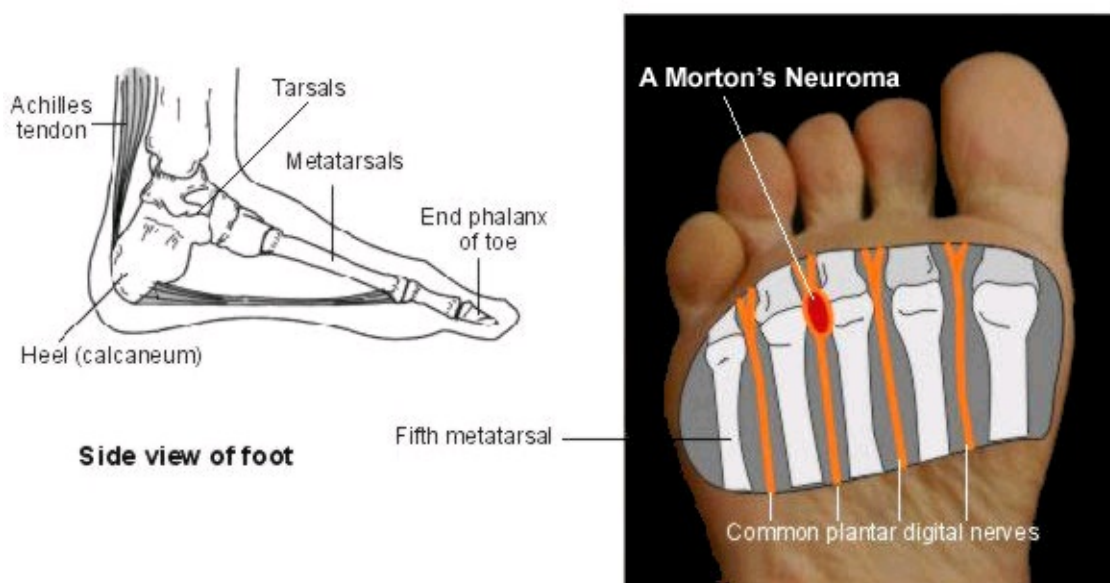
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Morton's Neuroma

Morton's neuroma is a condition that affects one of the nerves that run between the long bones (metatarsals) in the foot. The exact cause is not certain. Symptoms include pain, burning, numbness and tingling between two of the toes of the foot. About a quarter of people just need simple treatments including modification of their footwear. Sometimes surgery is needed for long-standing (chronic) symptoms.

Some anatomy of the foot

There are many bones in the foot. They can briefly be divided into the tarsal bones, the long bones (metatarsals) and the phalanges. The tarsal bones are the larger bones that form the back section of the foot, with the calcaneum being the largest. There are five metatarsal bones and these are given names from the first to the fifth. The first metatarsal bone is the largest and is the bone that joins to the big toe. Each toe has three phalanges, except the big toe which only has two.



There are many nerves, muscles and ligaments within the foot. Of note, the common plantar digital nerves run between the metatarsal bones in the foot. These have branches that supply sensation to the skin of the toes.

What is Morton's neuroma?

Morton's neuroma is named after Dr Morton who first described this condition in 1876. It is sometimes called Morton's metatarsalgia or interdigital neuroma.

It is a condition that affects one of the common plantar digital nerves that run between the long bones (metatarsals) in the foot. It most commonly affects the nerve between the third and fourth metatarsal bones, causing pain and numbness in the third and fourth toes. It can also affect the nerve between the second and third metatarsal bones, causing symptoms in the second and third toes.

Morton's neuroma rarely affects the nerve between the first and second, or between the fourth and fifth, metatarsal bones. It tends to affect only one foot. It is rare to get two neuromas at the same time in the same foot.

What causes Morton's neuroma?

Some say that this condition should not be called Morton's neuroma as, in fact, it is not actually a neuroma. A neuroma is a non-cancerous (benign) tumour that grows from the fibrous coverings of a nerve. There is no tumour formation in Morton's neuroma.

The exact cause of Morton's neuroma is not known. However, it is thought to develop as a result of long-standing (chronic) stress and irritation of a plantar digital nerve. There are a number of things that are thought to contribute to this. Some thickening (fibrosis) and swelling may then develop around a part of the nerve. This can look like a neuroma and can lead to compression of the nerve.

The anatomy of the bones of the foot is also thought to contribute to the development of Morton's neuroma. For example, the space between the long bones (metatarsals) in the foot is narrower between the second and third, and between the third and fourth metatarsals. This means that the nerves that run between these metatarsals are more likely to be compressed and irritated. Wearing narrow shoes can make this compression worse.

Sometimes, other problems can contribute to the compression of the nerve. These include the growth of a fatty lump (called a lipoma) and also the formation of a fluid-filled sac that can form around a joint (a bursa). Also, inflammation in the joints in the foot next to one of the digital nerves can sometimes cause irritation of the nerve and lead to the symptoms of Morton's neuroma.

Who gets Morton's neuroma?

About three people out of four who have Morton's neuroma are women. It commonly affects people between the ages of 40 and 50 but can occur at any age.

Poorly fitting or constricting shoes can contribute to Morton's neuroma. It is more common in women who habitually wear high-heeled shoes or in men who are required to wear tight (constrictive) footwear. It may also be more common in ballet dancers.

What are the symptoms of Morton's neuroma?

People with Morton's neuroma usually complain of pain that can start in the ball of the foot and shoot into the affected toes. However, some people just have toe pain. There may also be burning and tingling of the toes. The symptoms are usually felt up the sides of the space between two toes. For example, if the nerve between the third and fourth long bones (metatarsals) of the right foot is affected, the symptoms will usually be felt up the right-hand side of the fourth toe and up the left-hand side of the third toe. Some people describe the pain that they feel as being like walking on a stone or a marble.

Symptoms can be made worse if you wear high-heeled shoes. The pain is relieved by taking your shoe off, resting your foot and massaging the area. You may also experience some numbness between the affected toes. Your affected toes may also appear to be spread apart, which doctors refer to as the 'V sign'.

The symptoms can vary and may come and go over a number of years. For example, some people may experience two attacks of pain in a week and then nothing for a year. Others may have regular and persistent (chronic) pain.

How is Morton's neuroma diagnosed?

Morton's neuroma is usually diagnosed by your doctor listening to your symptoms and examining your foot. Sometimes your doctor can feel the 'neuroma', or an area of thickening in your foot, which may be tender.

Sometimes, your doctor may suggest an **ultrasound scan** or **MRI scan** to confirm the diagnosis but this is not always necessary. Some doctors inject a local anaesthetic into the area where you are experiencing pain. If this causes temporary relief of pain, burning and tingling, it can sometimes help to confirm the diagnosis and show the doctor where the problem is.

What is the treatment for Morton's neuroma?

Non-surgical treatments

Simple treatments may be all that are needed for some people with a Morton's neuroma. They include the following:

- **Footwear adjustments** including avoidance of high-heeled and narrow shoes and having special orthotic pads and devices fitted into your shoes.
- **Calf-stretching exercises** may also be taught to help relieve the pressure on your foot.
- **Steroid or local anaesthetic injections** (or a combination of both) into the affected area of the foot may be needed if the simple footwear changes do not fully relieve symptoms. However, the footwear modification measures should still be continued.
- **Sclerosant injections** involve the injection of alcohol and local anaesthetic into the affected nerve under the guidance of an ultrasound scan. Some studies have shown this to be as effective as surgery. However, this may not be widely available in the UK yet.
- **Cryotherapy**, or freezing, is sometimes used but is not widely available in the UK.

Surgical treatments

If these non-surgical measures do not work, surgery is sometimes needed. Surgery normally involves a small incision (cut) being made on either the top, or the sole, of the foot between the affected toes. Usually, the surgeon will then either create more space around the affected nerve (known as nerve decompression) or will cut out (resect) the affected nerve. If the nerve is resected, there will be some permanent numbness of the skin between the affected toes. This does not usually cause any problems.

You will usually have to wear a special shoe for a short time after surgery until the wound has healed and normal footwear can be used again.

Surgery is usually successful. However, as with any surgical operation, there is a risk of complications. For example, after this operation a small number of people can develop a wound infection. Another complication may be long-term thickening of the skin (callus formation) on the sole of the foot (known as plantar keratosis). This may require treatment by a specialist in care of the feet (chiropody).

What is the outlook (prognosis) for Morton's neuroma?

About one person in four will not require any surgery for Morton's neuroma and their symptoms can be controlled with footwear modification and steroid/local anaesthetic injections. Of those who choose to have surgery, about three out of four will have good results with relief of their symptoms.

Recurrent or persisting (chronic) symptoms can occur after surgery. Sometimes, decompression of the nerve may have been incomplete or the nerve may just remain 'irritable'. In those who have had cutting out (resection) of the nerve (neurectomy), a recurrent or 'stump' neuroma may develop in any nerve tissue that was left behind. This can sometimes be more painful than the original condition.

Can Morton's neuroma be prevented?

Ensuring that shoes are well fitted, low-heeled and with a wide toe area may help to prevent Morton's neuroma.

Further reading & references

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