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S1 dermatomal numbness: Radiculopathy or Morton's neuroma

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ABSTRACT

Morton's neuroma refers to a degenerative, compressive neuropathy affecting one of the common digital nerves in the forefoot, typically situated between the heads of the third and fourth metatarsal bones. The condition arises primarily due to repetitive compression and mechanical irritation of the interdigital nerve, particularly beneath the plantar portion of the transverse intermetatarsal ligament. Although historically labelled a "neuroma," this entity lacks neoplastic features and is instead characterised by perineural fibrosis and nerve degeneration. It is known by several alternative terms in medical literature, including interdigital neuritis, intermetatarsal neuroma, Morton's metatarsalgia, interdigital neuralgia, interdigital nerve entrapment, and interdigital compression neuropathy (1, 2).

This case report describes a 45-year-old female patient with a typical Morton's neuroma, who underwent surgical treatment after experiencing symptoms for over 15 years.

CASE REPORT

A 45-year-old female patient had been experiencing persistent pain in her right foot for more than 15 years. During this period, she underwent multiple courses of physical therapy without significant improvement. Over time, the pain progressed to the point where she was unable to walk normally due to severe discomfort.

The patient was referred to a neurosurgeon under the suspicion of lumbosacral radiculopathy, primarily because she reported numbness in her right foot. MRI of the lumbar spine ruled out a suspected disc herniation. Also, neurological examination did not reveal any signs consistent with radicular deficit. The straight leg raise test

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(Lazarevic/Lasegue sign) was negative, and although the patient complained of numbness and pain in the S1 dermatome distribution, her symptoms were not consistent with lumbar nerve root compression.

On further clinical evaluation, focal tenderness was detected upon palpation between the third and fourth metatarsal bones of the right foot. Additionally, the metatarsal squeeze test was positive, as well as the Mulder's click test. Given these findings, the patient was referred for magnetic resonance imaging of the foot, which revealed a lesion suspicious for a Morton's neuroma at the typical location in the right foot (Figure 1).

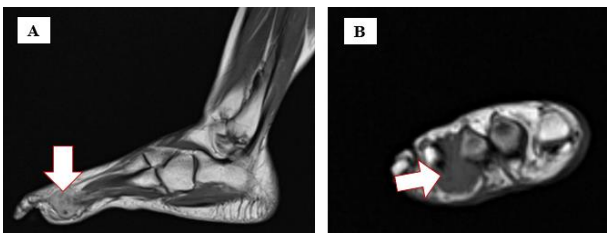

Figure 1. Magnetic resonance imaging of the foot in the sagittal (A) and coronal (B) planes. The arrow indicates the typical appearance of Morton's neuroma, particularly evident in image B, where it has a teardrop shape.

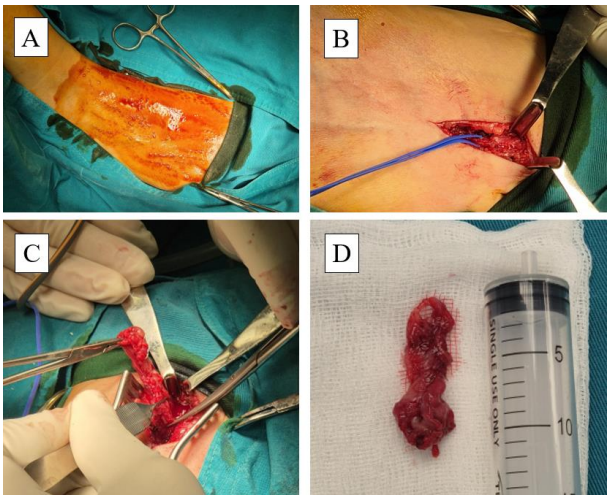

Figure 2. (A) Preoperative Setting. (B) Dissection following transection of the metatarsal ligament and securing the proximal nerve segment with tape. (C) Transection of the proximal segment of the affected interdigital nerve. (D) Completely resected Morton's neuroma.

Following preoperative preparation, the patient underwent surgical excision of the neuroma. Intraoperatively, a typical Morton's neuroma was identified and resected (picture 2). The postoperative course was uneventful, and the patient was discharged on the second postoperative day. At the one-month follow-up, the patient was asymptomatic, reported no pain or numbness, and was able to walk without difficulty. Histopathological analysis confirmed the diagnosis of Morton's neuroma. The specimen showed perineural fibrosis, nerve fiber degeneration, and fibrotic thickening of the epineurium and perineurium, consistent with a chronic compressive neuropathy.

Discussion

Morton's neuroma is best understood as a chronic entrapment neuropathy involving the common plantar digital nerve, most often arising within the third intermetatarsal space. Although traditionally termed a "neuroma," it does not represent a true tumor; instead, it reflects a degenerative process marked by perineural fibrosis and progressive nerve damage caused by repetitive mechanical compression of the interdigital nerve beneath the transverse intermetatarsal ligament. The disorder is most frequently observed in middle-aged patients and shows a higher prevalence among women, likely related to biomechanical influences such as footwear that increases forefoot loading and pressure (2, 3). In our case, the patient was a woman in her fifth decade of life, representing a demographically and epidemiologically typical presentation.

The symptoms of Morton's neuroma are frequently variable and not highly specific. Patients typically report a burning pain localized to the forefoot, often accompanied by paresthesia or numbness radiating into the toes. Because these complaints can resemble radicular sensory symptoms, the condition may initially be interpreted as related to spinal pathology. This overlap in clinical presentation can lead to diagnostic uncertainty and may delay recognition of the underlying peripheral nerve condition (1, 2, 4). Delayed diagnosis of Morton's neuroma has been described in several studies, primarily due to the nonspecific nature of symptoms and the wide range of differential diagnoses that include metatarsalgia, stress fractures, peripheral neuropathy, and lumbosacral radiculopathy. In many patients, symptoms persist for prolonged periods before the correct diagnosis is established (1, 4). In the present case, the patient experienced persistent symptoms for more than 15

years before the neuroma was identified. This unusually long diagnostic delay highlights the importance of considering interdigital nerve pathology in patients with chronic foot pain that does not respond to conservative therapy. Particular attention should be given in cases where patients do not respond to treatment directed at presumed spinal pathology. In such situations, especially when pronounced radicular-like symptoms are present, including pain, burning, or paresthesia in the foot, a thorough local examination of the foot should be routinely performed. This approach is essential to avoid misdiagnosis and to ensure timely identification of peripheral nerve conditions such as Morton's neuroma.

Physical examination continues to play a central role in diagnosing Morton's neuroma. Typical findings include focal tenderness within the intermetatarsal space, elicitation of symptoms with compression of the metatarsal heads, and a palpable or audible Mulder's click. When these clinical signs raise suspicion, imaging techniques such as ultrasonography or magnetic resonance imaging can be employed to support the diagnosis. MRI is particularly valuable due to its superior soft-tissue resolution, enabling clear visualization of interdigital nerve enlargement and helping to rule out other causes of forefoot pain (4, 5).

Management of Morton's neuroma typically starts with non-operative measures, such as modification of footwear, use of orthotic devices, physiotherapy, and local corticosteroid injections. However, in cases where symptoms persist or lead to marked functional impairment, surgical resection of the involved nerve segment is considered the definitive option. According to the literature, operative treatment is associated with high rates of symptom improvement and patient satisfaction (3). In our case, surgical resection of the neuroma resulted in complete resolution of both pain and sensory disturbances. Given the prolonged duration and severity of symptoms at presentation, we opted for immediate surgical intervention without attempting conservative management. Histopathological examination confirmed the diagnosis by demonstrating characteristic findings of chronic compressive neuropathy, including perineural fibrosis and degenerative nerve changes.

This case highlights the need to include Morton's neuroma in the differential diagnosis of patients with chronic forefoot pain accompanied by sensory disturbances that may resemble radiculopathy. When symptoms persist despite conservative management, a focused clinical assessment of the intermetatarsal spaces, along with appropriate imaging of the foot, is warranted to ensure accurate diagnosis and to minimize delays in identifying the underlying condition.

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