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Misdiagnosed Morton's versus Hauser's neuroma

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Abstract

Introduction: Morton's and Hauser's neuromas are interdigital neuromas that occur at the third and second intermetatarsal space, respectively. Patients typically present with numbness or pain in the affected toes that is exacerbated with activity. Overpronation, activities that increase forefoot pressure, tight shoes, and female sex are associated, although males can also be affected. Etiology is believed to involve collapse of the transverse arch, increased traction and inflammation of the digital plantar nerves, entrapment by the transverse interdigital ligament, and scar tissue formation. Their identical etiology is one of the reasons behind the similar presentations of interdigital neuromas and their source of diagnostic confusion.

Case Description: The patient is a 23-year-old male with no significant past medical history complaining of shooting pain in his right foot for three weeks that began abruptly. He denied wearing narrow toed shoes. Physical exam elicited tenderness at the right second and third digits. X-ray of the foot was negative. He was unsuccessfully treated for a plantar injury, then a pinched nerve. MRI indicated neuromas at the second and third intermetatarsal webspace, and he was diagnosed with Morton's neuroma. He continued to fail conservative treatment and eventually underwent surgery to remove the neuromas. A 8x6mm and 3x2mm webspace neuroma was removed from the second and third intermetatarsal webspaces, respectively, and his symptoms resolved.

Discussion: This case presents a misdiagnosed neuroma that was likely treated with an incorrect conservative treatment regime, prolonging patient discomfort and increasing treatment time and medical fees. It also exposes the misconception that plantar neuromas are all grouped together under the diagnosis of Morton's neuroma. Education is necessary to differentiate between interdigital neuromas, ensuring more accurate diagnosis and better management of this common dysfunction. Further research should be conducted to determine the best treatment algorithm, taking into consideration the patient's symptomatology and neuroma size.

Keywords: Morton's, Hauser's, interdigital, plantar, neuroma

Introduction

Morton's neuromas are the most common interdigital neuromas and occur at the third intermetatarsal space between the third and fourth distal metatarsals ^[1, 2]. Patients typically present with numbness or pain in the affected toes that is exacerbated with activity. The etiology is believed to involve collapse of the transverse arch, leading to increased traction and inflammation of the respective digital plantar nerves, subsequent entrapment by the transverse interdigital ligament, and scar tissue formation.

Hauser's neuromas are similar interdigital neuromas that occur at the second intermetatarsal space between the second and third distal metatarsal ^[3, 4]. Their etiology is identical, and one of the reasons behind their similar presentation and source of diagnostic confusion.

Regarding both Morton's and Hauser's neuromas, overpronation, activities that increase forefoot pressure, tight fitting shoes, and female sex are also associated, although males can be affected as well. Mulder sign may be elicited on physical examination of a patient with Morton's neuroma, where pain and a "click" is reproduced by squeezing the third and fourth metatarsal heads together while applying pressure within the interdigital space ^[4].

Case Description

The patient is a 23-year-old male with no significant past medical history that presented to the podiatrist complaining of shooting pain in his right foot for three weeks that began abruptly while at rest. He added that he had difficulty ambulating during the three weeks because of the pain. He denied wearing narrow toed shoes. At the time of presentation, vital signs were all within normal limits. Pertinent review of systems was negative. Physical examination indicated tenderness on the right plantar region around the second and third toes. An X-ray of his right foot was negative.

The patient was diagnosed with a plantar foot injury of his right foot, and his foot was put in a hard sole shoe cast for six weeks.

After six weeks, the patient still reported sharp, shooting pain, now with numbness. At this point, the patient was informed that he may have a pinched nerve by the podiatrist and was started on oral steroids. After one month with no resolution, the patient was prescribed custom orthotics, however, they provided minimal relief and the patient returned to the clinic two months later. This time, the patient was given two cortisone injections with sclerosing agents at the second and third intermetatarsal spaces which provided relief for six weeks.

However, after the six weeks, the patient returned complaining of the same pain with the same intensity. An MRI was ordered and indicated a neuroma at the second intermetatarsal webspace, a smaller neuroma at the third intermetatarsal webspace, and intermetatarsal bursitis. He was diagnosed with Morton's neuroma. The patient was given a sclerosing injection of alcohol and lidocaine in conjunction with corticosteroids which provided moderate relief for two months.

After the two months, the patient returned with the same complaints and was subsequently scheduled to undergo surgery. During surgery, the Lisfranc ligament was noted to be intact, however the neuroma was significantly larger than anticipated. An 8x6mm second webspace neuroma and a 3x2mm third webspace neuroma was removed. The patient underwent physical rehabilitation for four weeks, and his symptoms finally resolved 10 months after initial presentation.



Fig 1: MRI-3T image showing enhancement in the second metatarsal webspace

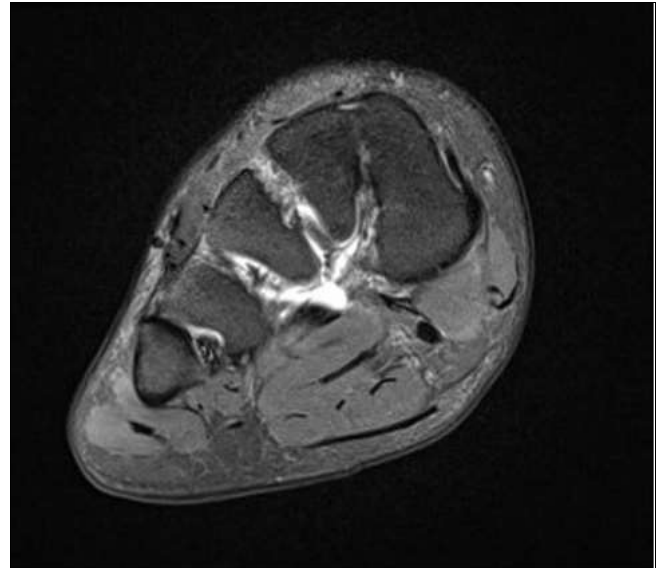


Fig 2: MRI-3T image showing enhancement in the second and third metatarsal webspaces

Discussion

Education is necessary to differentiate between interdigital neuromas, ensuring more accurate diagnosis and better management of this common and hindering dysfunction. While interdigital neuromas have similar symptoms and presentations, their location will reveal the accurate nomenclature for the correct diagnosis. Heuter's neuroma occurs at the first intermetatarsal space between the first and second distal metatarsals. Hauser's neuroma occurs at the second intermetatarsal space between the second and third distal metatarsals. Morton's neuroma occurs at the third intermetatarsal space between the third and fourth distal metatarsals. Lastly, Iselin neuroma occurs at the fourth intermetatarsal space between the fourth and fifth distal metatarsals. Orthotics and ergonomic footwear are often used in non-invasive treatment of neuromas of the foot in order to redistribute plantar pressure away from the neuroma, allowing for healing. Steroid and/or sclerosing injections are often the next step. If the patient still has not obtained significant pain relief, they will typically undergo one of three surgical treatments: neurectomy, neurolysis, or osteotomy. In a neurectomy, the entire nerve affected by the neuroma is excised. In a neurolysis, only the neuroma is excised, and the rest of the healthy nerve is left intact. Lastly, in an osteotomy, the metatarsal adjacent to the neuroma is reduced to provide more room for the nerve to heal and prevent future irritation.

This case presents an example of a misdiagnosed neuroma that likely was treated with an incorrect orthotic or conservative treatment regime, prolonging patient discomfort and increasing treatment time and medical fees. Eliminating the confusion regarding naming may result in more accurate visualization on imaging, which is typically done using ultrasound or MRI, because clinicians will have better guidance on where to focus their attention when looking for the presence of neuromas.

These suggestions, combined with activity modification, ergonomic footwear, custom orthotics, and steroid injections, may prevent the need for more invasive management, such as surgical decompression and removal, and the negative sequelae associated with inactivity due to pain.

Conclusion

Our patient's experience is a testament to the common misconception that plantar neuromas are commonly grouped together under the diagnosis of Morton's neuroma, creating confusion and prolonging symptoms^[6, 7]. For this reason, it is important for clinicians to be aware of the naming of foot neuromas. There is a very limited amount of literature available regarding the different neuromas and the challenges in differentiating them from a diagnostic standpoint. Due to the reduction in quality of life that interdigital foot neuromas cause, and the prolongation of symptoms that can occur when misdiagnosed, further research should be conducted to determine the best treatment algorithm, taking into consideration the patient's symptomatology and size of the neuroma on imaging.

Acknowledgments

Conflict of Interest

The authors declare no conflict of interest

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