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Case Report
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A rare disease to be considered in forefoot pain: Morton's neuroma

Ali Pakırdaşı[1]*

[1]Department of Orthopedics and Traumatology, University of Health Sciences, Kayseri City Training and Research Hospital, 38060, Kayseri, Turkey

***Corresponding author:** Ali Pakırdaşı, MD, University of Health Sciences, Kayseri City Training and Research Hospital, 38080, Kayseri, Turkey; pakirdasia@gmail.com

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Abstract

Morton's neuroma, one of the causes of severe forefoot pain, is not a true nerve-based tumoral pathology, contrary to what is expected. Diagnosis can be made with comprehensive anamnesis, detailed physical examination and descriptive radiological examinations. Various conservative and surgical treatment options are available. In this study, we presented two cases diagnosed with Morton's neuroma.

Keywords: Morton's neuroma, intermetatarsal ligament, interdigital nerve, surgery, foot

Introduction

Morton's neuroma is a disease characterized by burning pain radiating to the forefoot and toes, sometimes presenting with hypoesthesia, and characterized by the feeling of stepping on a pebble while walking [1-3]. Its etiopathogenesis has been attributed to the compression of the interdigital nerve between the metatarsal heads [1]. Due to the entrapment of the interdigital nerve under the transverse intermetatarsal ligament, it has also been defined in the literature with names such as "interdigital neuritis, interdigital nerve compression syndrome". Therefore, it is not a true neuroma [1-3].

Morton's neuroma is more common in women [2]. This is attributed to the fact that women more often wear narrow toe box, high-heeled shoes than men and that the 4th and 5th metatarsals, which are mobile, press against the 1st and 2nd metatarsals, which are immobile, resulting in entrapment of the interdigital nerve under the intermetatarsal ligament [3].

Morton's neuroma is frequently seen in the 3rd web space and less frequently in the 2nd web space [2,4]. Diagnosis is made by detailed anamnesis and physical examination [1-4]. If there is any doubt, the relief of symptoms with the injection of 2 ml of lidocaine under the intermetatarsal ligament supports the diagnosis [1-4]. Direct radiography, ultrasonography (USG) or magnetic resonance imaging (MRI) can be used for diagnosis [1-4]. Direct radiography helps to exclude bony pathologies, while USG and MRI help to demonstrate neuroma [4].

There are conservative treatment methods in the treatment of Morton's neuroma such as personalized shoes and insoles, physical therapy exercises, corticosteroid injections, metatarsal pads, and anti-inflammatory drugs [6]. In patients who do not respond to these treatment methods, there are surgical methods such as neuroma excision and release of the transverse metatarsal ligament [5]. In this study, we presented two cases diagnosed with Morton's neuroma.

Case report

Case 1

A 58-year-old female patient. She has no known chronic disease or history of regular medication use. She applied to our clinic with a complaint of left forefoot pain for approximately seven years. The patient's pain intensity was measured as 10 when evaluated with the Visual Analog Scale (VAS). The patient, who described that her complaints increased with wearing narrow-toed shoes and that she felt like a pebble was stabbing the sole of her foot while walking, stated that her pain is not relieved with the anti-inflammatory treatment, shoe changes and corticosteroid injections previously recommended at another clinics. During physical examination, the patient, who described severe pain with compression of the metatarsals from the 2nd web space and had a mass approximately 1x1 cm palpable in the same region, was asked for an MRI with a preliminary diagnosis of Morton's neuroma. While no osseous pathology was observed on the patient's radiographs to explain her complaints, the mass in the 2nd web space was evaluated in favor of Morton's neuroma on MRI. Surgery was recommended for the patient as a result of the examinations.

The patient was placed on the table in a supine position under spinal anesthesia and a tourniquet was applied but not inflated. After preoperative cleansing with povidone-iodine and draping of

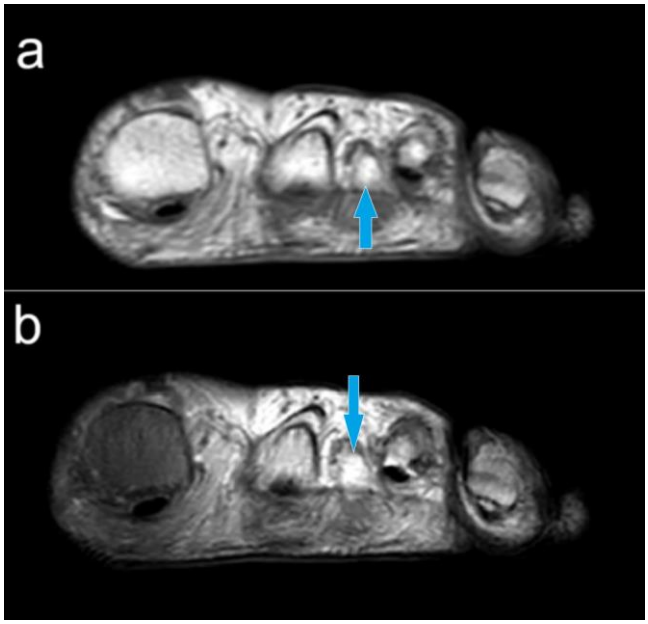

Fig. 1: a) T1 MR image, b) T2 MR image of Morton's neuroma located between the 2nd and 3rd metatarsal heads of the patient's foot (arrow).

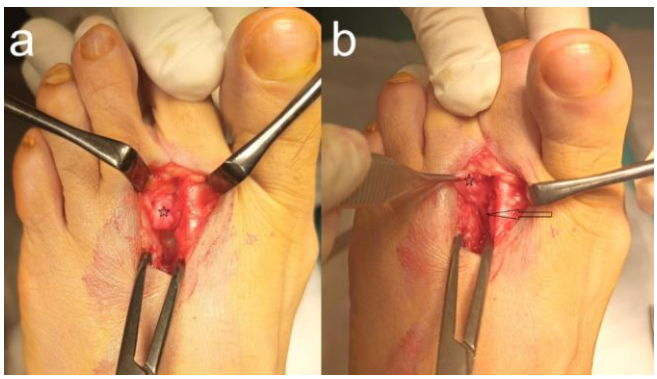

Fig. 2: a) Intraoperative view of Morton's neuroma in the 2nd web space of the left foot (asterisk), b) Nerve trace view associated with Morton neuroma in the 2nd web space of the left foot (arrow).

the surgical field, a longitudinal incision of approximately three cm was made in the dorsal part of the left foot in the 2nd web space, and the skin and subcutaneous tissue were passed. The transverse metatarsal ligament was incised. The interdigital nerve tract was followed. A neural mass was seen at the field of the patient's complaints during preoperative palpation. The mass was excised with careful dissection, preserving the digital structure. The mass was sent to pathology for examination. The layers were closed (Figures 1 and 2). The pathology of the excised tissue was reported as Morton's neuroma.

Case 2

A 43-year-old female patient. She has known hypothyroidism and is regularly taking levothyroxine. She has been describing a

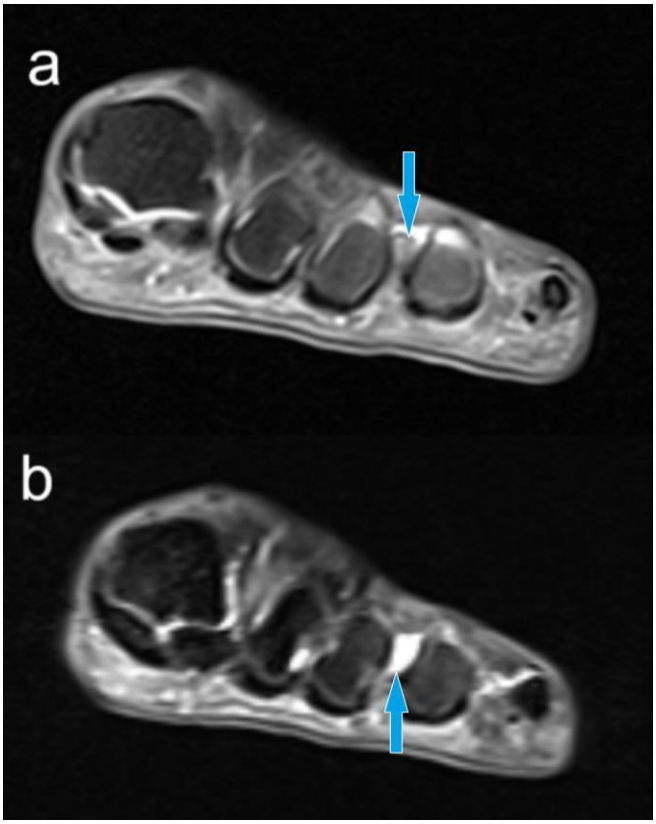

Fig. 3: a) T1 MR image, b) T2 MR image of Morton's neuroma located between the 3nd and 4rd metatarsal heads of the patient's foot (arrow).

stinging sensation on the plantar aspect of her left foot for six years and a feeling of stepping on a pebble while walking. The patient's pain intensity was measured as eight when evaluated with the VAS. The patient, who was recommended to change her shoes and take anti-inflammatory medication at another clinics, did not benefit from the treatments. In the physical examination, there is a painful mass approximately 2x2 cm palpable in the 3rd web space. In the physical examination, the patient, who described severe pain with compression of the metatarsals in the 3rd web space, was asked for an MRI with a preliminary diagnosis of Morton's neuroma. While no osseous pathology was observed in the patient's radiographs that would explain her complaints, the mass in the 3rd web space was evaluated in favor of Morton's neuroma in the MRI. Surgery was recommended for the patient as a result of the examinations. The patient was placed on the table in the supine position under spinal anesthesia, a tourniquet was applied and inflated to 180 mmHg. After preoperative cleansing with povidone-iodine and draping of the surgical field, a longitudinal incision approximately 3 cm was made from the 3rd web space on the dorsal side of the left foot to the skin and subcutaneous fascia. Extensor tendons were retracted. The transverse metatarsal ligament was incised while preserving the digital structures. A structure resembling Morton's neuroma was detected in the 3rd web space. It was excised in total. It was sent to pathology for examination. The layers were closed (Figures 3 and 4). The pathology of the excised tissue was reported as Morton's neuroma.

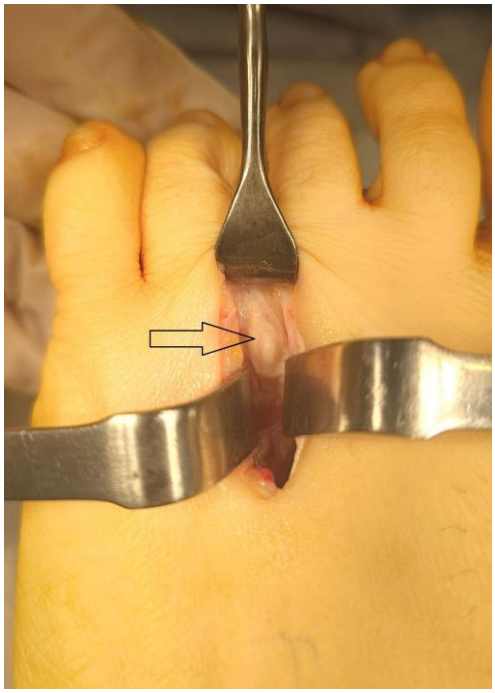

Fig. 4: Intraoperative view of Morton's neuroma in the 3rd web space of the left foot (arrow).

Discussion

Although Morton neuroma was firstly described by Civinini in 1835 as a fusiform swelling of the digital nerve, it was described in 1876 with Thomas Morton's 15 disease series [4]. Although conservative methods are recommended as the first choice in the treatment of the disease, there are studies in the literature to the contrary [5]. In conservative treatment, methods such as wide shoe preference, activity restriction, manual therapy can be tried. Local injection and ablation applications are among the treatment methods before surgery [2-4]. In the systematic review and meta-analysis conducted by Matthews et al., nonsurgical treatment methods were evaluated in Morton neuroma, and corticosteroid injection and manipulation/mobilization applications were shown to be more effective in reducing pain [6]. Conservative treatment was not preferred again because the patients in this case report had a history of corticosteroid injections, used anti-inflammatory drugs, changed shoes but did not benefit [4,5]. Plantar and dorsal approaches have been described in the literature for the surgical treatment of Morton's neuroma [7]. No significant advantage of the two incisions has been shown over each other [6,7]. Since we have more clinical experience with the dorsal approach, the dorsal approach was preferred in both patients [7,8]. There are neurectomy or nerve decompression options in the surgical treatment of Morton's neuroma [8-13]. Neurectomy is the most commonly applied surgical method in cases that do not respond to other treatment methods [7,8]. In addition, when compared to other peripheral entrapment neuropathy treatments such as carpal tunnel syndrome and cubital tunnel syndrome in orthopedics, it is the only surgery in which the nerve is excised [8]. In a long-term follow-up study of 41 patients who underwent neurectomy, VAS scores were poor in only 7% of the patients, and the best result was reported in neuromas larger than 3 mm that underwent surgery within the first 12 months [9]. One of the most important complications of neurectomy surgery is recurrence, and it is recommended to excise the nerve proximally to avoid this [10]. In order to avoid this complication in this case, excision was made 3 cm proximal to the distal metatarsal ligament [9-13]. Treatment of Morton neuroma, which is one of the causes of pain in the forefoot, should be started diagnosing with detailed physical examination, comprehensive anamnesis and investigating possible causes in the differential diagnosis [7-13]. All treatment options should be presented to the patient in the treatment planning of Morton neuroma [6-13]. Depending on the patient's pain and the impact on quality of patient life, surgical approaches can be applied with experienced teams besides to conservative treatment. In conclusion, it is useful to keep this rare disease in mind in order to diagnose patients with non specific foot pain.

Author contributions

Author contributed to the study conception and design. Material preparation, data collection and analysis were performed by Ali Pakırdaşı. The first draft of the manuscript was written by Ali Pakırdaşı and author commented on previous versions of the manuscript. Author read and approved the final manuscript.

Statements and declarations

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Conflict of Interest

The authors declare that they have no conflict of interest.

Ethical statement

The authors confirm that this retrospective study was conducted in accordance with the ethical standards set forth in the Declaration of Helsinki and its later amendments.

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