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Case Report

Rheumatoid nodule presenting as a Morton's neuroma in the foot: An important differential diagnosis to consider☆

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ABSTRACT

A 51-year-old lady with a background of rheumatoid arthritis presented to the foot and ankle clinic with pain and a typical history of Morton's neuroma. Examination revealed a palpable swelling over the right foot in the third intermetatarsal space. Following failed conservative management, the patient underwent excision of the neuroma. Histology revealed of necrotizing granulomas with peripheral palisading and no evidence of features specific to a neuroma. This has rarely been described previously and supports the concept of rheumatoid synovitis and nodules producing symptoms mimicking Morton's neuroma/metatarsalgia.

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Introduction

Lewis Durlacher initial described interdigital neuroma in 1845 [1]. His description was subsequently expanded by T.G. Morton in 1876. He described "a peculiar and painful affection of the fourth metatarsophalangeal articulation." This was resultant from the pinching of the lateral planter nerve between the fourth and fifth metatarsal heads [2].

Morton's neuroma is a nonmalignant enlargement of the common plantar digital nerve, seen typically at the second or third intermetatarsal space [3]. It is more common in middle aged females. Many clinicians consider Morton's neuroma a primary cause of metatarsalgia and a key differential diagnosis in any patient presenting with forefoot pain. Patients present with a burning sensation on the plantar aspect of the foot between the metatarsal heads of corresponding toes [4]. Pain is aggravated by weightbearing, walking,

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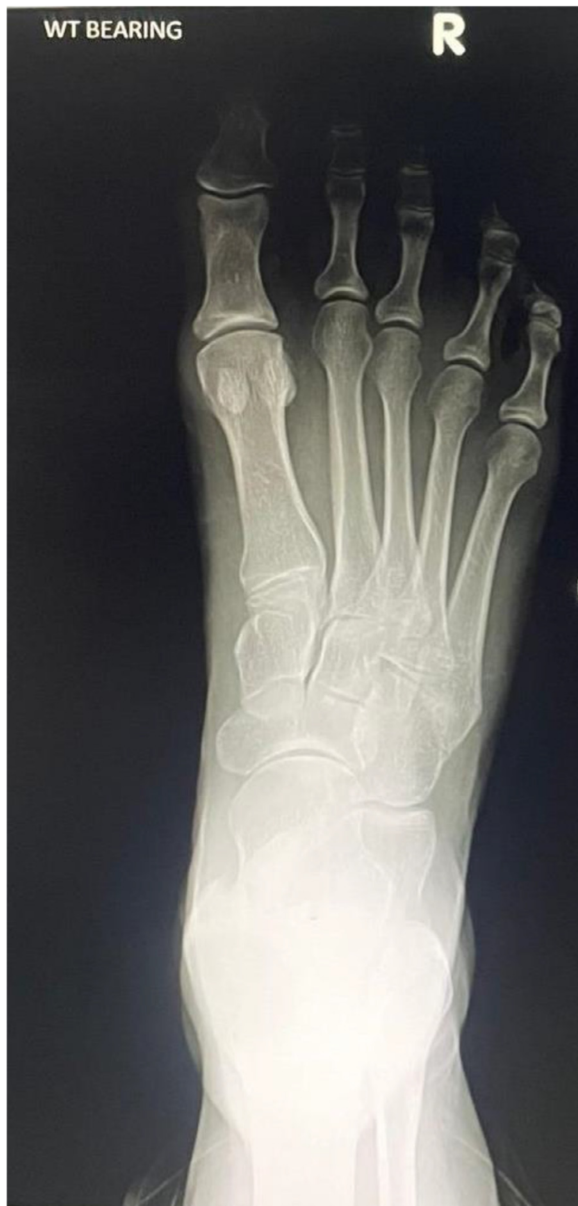

Fig. 1 – Anterior-posterior radiograph of the right foot, demonstrative of no gross abnormality.

and wearing narrow toe box shoes, and relieved by subsequent rest. Other symptom manifestations include paresthesia in the plantar aspect of web space, shooting pain and the sensation of walking on a lump on the ball of the great toe [5].

Despite Morton's neuroma being described as a clinical syndrome over a century ago, its mechanism of injury and pathogenesis is still not fully understood by researchers [3,5]. Many have hypothesized the theory of compression and tension of the interdigital nerve around the transverse intermetatarsal ligament as the primary etiology, others have considered the primary etiology cause as recurrent repetitive microtrauma, equinus deformity or autonomic neuropathy [6].

Diagnosis of Morton's neuroma is made clinically with tenderness over the plantar aspect of the involved webspace with a palpable neuroma and a positive Mulder's click on examination. Clinical examination has been proven to be more sensitive and specific than imaging modalities such an ultrasound scan and magnetic resonance imagining [7]. When considering the variability of patient symptom presentation, the treatment modality choice has provided active debate of recent time [5,7]. Conservative management has been associated with a high degree of variable success rate [8]. Nonoperative treatment methods such as wide show box with firm sole and metatarsal pad have unpredictable outcomes, with only 20% of patients having complete resolution of symptoms [9]. Corticosteroid injections with local anesthetic is also considered futile in long term follow-up outcomes of 6 months and 12 months [10]. Currently, Surgery is considered the treatment of choice with either dorsal or plantar approach. Surgical resection has shown good long-term results, with improvement in 78 % of cases [11]. The dorsal approach is currently the most popular, it involves 3-4 cm incision just proximal to the involved webspace and blunt dissection to avoid injury to branches of superficial peroneal nerve [12]. Postoperatively, histopathology is essential when considering a formal diagnosis.

Rheumatoid nodules and Morton's neuroma share many of the same clinical manifestations and therefore can be misinterpreted for one another. The best way to distinguish between the two is by a combination of an accurate physical examination, detailed history taking, radiological imaging and histopathological findings correlation [13,14]. Rheumatoid nodules producing symptoms mimicking Morton's neuroma, is an extremely rare occurrence, with few studies published in the literature [6]. We report a case report of a rheumatoid nodule presenting as a Morton's neuroma in the foot. Informed consent was obtained from the patient prior to being included in the case report.

Case report

A 51-year-old lady with a background of long-standing rheumatoid arthritis (15 years) presented to the foot and ankle clinic with a 6 month history of pain and swelling over the right foot in the third intermetatarsal space. Pain was exacerbated by walking and relieved on rest. Upon clinical examination there were no pins or needles. There was however splaying visible at the forefoot with a palpable swelling associated with an audible positive Mulder's click over the third intermetatarsal space. There were no obvious callosities in her forefoot and no plantar displacement of the metatarsal heads. A clinical diagnosis of Morton's neuroma was made. An ultrasound scan of the right foot showed a swelling in the 3rd and 4th intermetatarsal space in keeping with the clinical diagnosis of Morton's Neuroma. Radiographs of the feet did not reveal any abnormality (Figs. 1 and 2).

After unsuccessful conservative management with special orthotics the patient opted for operative management. The patient underwent surgery, with a dorsal approach used in the corresponding intermetatarsal space. Intraoperatively, a large soft tissue mass 2.5-3 cm in diameter involving the digital

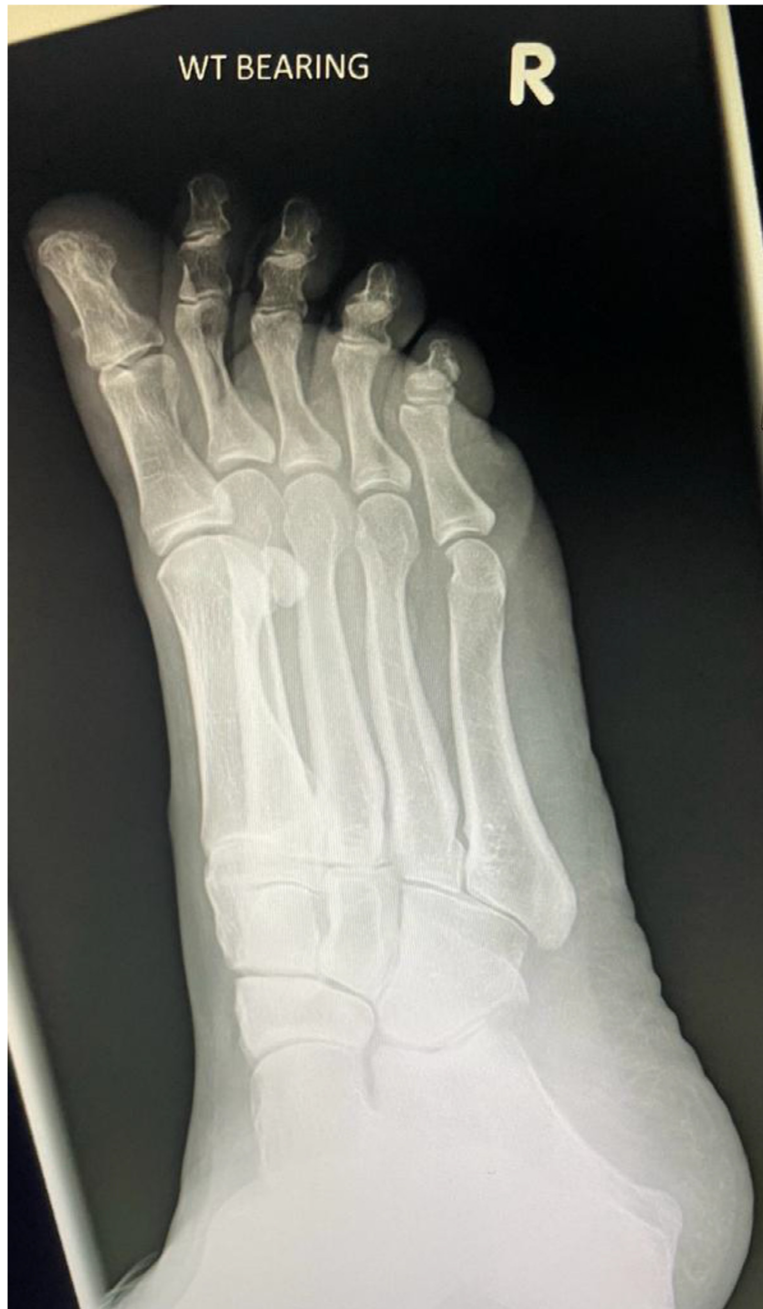

Fig. 2 – Oblique radiograph of the right foot, demonstrative of no gross abnormality.

nerve and capsule of the second metatarsophalangeal (MTP) joint was noted, along with necrosis of the underlying fat pad.

Histopathology concluded the mass of the operative specimen consisted of necrotizing granulomas with peripheral palisading and no evidence of features specific to a neuroma, dysplasia nor malignancy. The presence of granulomatous lesions was indicator that it was indicative of a rheumatoid nodule.

Postoperatively the wound healed well and at 6-month review in outpatient clinic the patient was pain free and happy with the outcome of surgical removal. She was subsequently discharged from the clinic.

Discussion

Also called interdigital neuroma, Morton's neuroma is a common cause of pain and/or paresthesia in the forefoot. It is a common paroxysmal neuralgia affecting the forefoot, typically in the third interdigital space. Since the first description of the interdigital neuroma by Durlacher in 1845, there has been controversy as to its pathogenesis [1,2,6]. Rheumatoid arthritis has been implicated by several authors as an association.

In 1956, Vainio and Ritama described 5 patients with interdigital neuromas from their practice, of these 5 patients

3 patients had rheumatoid arthritis [11]. In one of the patients there was an intimate association of the neuroma with a rheumatoid nodule similar to the relationship found in our patient. The involvement of Rheumatoid nodules and their association with Morton's Neuroma has also been reported by Hofbauer et al. [12,13].

Zielaskowski et al. [14] reported multiple neuromas coexisting with rheumatoid synovitis and a rheumatoid nodule. The patient presented with a primary complaint of pain and a burning sensation on the plantar aspect of her left foot of 3 months' duration. Additionally, the burning sensation was located at the third intermetatarsal space and radiated into the third and fourth toes. She was initially treated with neuroma infiltration, and then underwent surgical management. Two soft tissue masses were excised with a dorsal excision. On histology, both masses were coexistent Morton's neuroma and chronic rheumatoid synovitis and one of the masses was consistent with rheumatoid nodules. Following surgical excision, the patient had complete pain relief.

In 2012, Chaganti et al. [6] described rheumatoid nodules mimicking Morton's metatarsalgia as a rare occurrence. In their case series study, they report 3 patients (5 feet) presenting with symptoms and signs of Morton's neuroma due to underlying rheumatoid nodules. Two patients had bilateral involvement. Histology of the excised mass showed presence of a rheumatoid nodule and Morton's neuroma in 4 feet and a rheumatoid nodule and unremarkable nerve bundles in 1. Out of these 3 patients, only 1 patient has a past medical history of rheumatoid arthritis.

Conclusion

The foot is a common location of rheumatoid arthritis manifestation and should not be overlooked. Rheumatoid synovitis and nodules producing symptoms mimicking Morton's neuroma have been reported in the literature but is still rare. We therefore recommend that a nodule of rheumatoid origin should be considered in the differential diagnosis of Morton's neuroma especially in patients with a known history of rheumatoid arthritis. The presence of a rheumatoid nodule in the foot may also be the first manifestation of rheumatoid arthritis, and hence requires prompt referral to the rheumatology team for further investigation. After an accurate diagnosis, pharmacological rheumatoid arthritis control and physical medicine and rehabilitation programs are crucial to optimal clinical and functional improvement.

Clinical message

The case is rare, at the time of writing there are only a handful of published papers detailing a Rheumatoid nodule presenting Morton's neuroma in the foot. Our hope is that this information can be used by surgeons to inform their decisions and improve patient outcomes.

Patient consent

We can confirm that written, informed consent for publication of their case was obtained from our patient.

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