

Feet gouty tophus as a Morton's neuroma pretender

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Introduction

Gout is a disease characterized by high blood uric acid levels and monosodium urate crystal deposits in joints and extra-articular tissues.¹ This chronic condition is often associated with the presence of gouty tophi. Gout is most often seen in feet at the level of the first metatarsal-phalangeal joint. This condition has been called the great pretender, due to the wide onset spectrum that has been described.² The purpose of this publication is to present a case of a gouty tophus atypically located, as a Morton's neuroma's pretender as first symptom of the condition.

Case

A 52 year-old male consults for selective fourth metatarsal (4M) pain with 12-month history, together with paresthesia and neuritic pain radiated to the third interdigital space; no known history of other conditions. At physical examination, he feels pain at palpation under the 4M head and neck, with neither metatarsal-phalangeal instability nor hyperkeratosis.

Morton's neuroma is assumed to be the condition, and differential diagnoses with other conditions that cause metatarsal pain are set out. The patient is asked to take imaging studies to supplement physical examination.

The anterior-posterior, lateral and oblique foot X-rays show an image of calcium density with blur limits on the 4M neck (Figure 1).

Three D reconstruction CD scanning shows a calcium density, multi-lobulated, space occupying bulge that does not involve the 4M plantar cortex (Figure 2). The image is interpreted as a calcified plantar bulge and, among possible diagnoses, bizarre parosteal osteochondromatous proliferation (Nora's lesion), florid reactive periostitis, parosteal osteosarcoma, osteochondroma and myositis ossificans are set out.

In this context and in view of the diverse differential diagnoses, a puncture-biopsy is prescribed. The material is analyzed by the Pathology Department, which reports urate crystal deposits with giant cells that look like gouty tophi.

The lesion is removed by plantar approach verifying a tumoral lesion of granular looks, opaque, whitish, doughy, located between the 4 M neck and the digital flexor tendons with no involvement of the plantar cortex (Figure 3).

A week-rest is prescribed with no weight bearing and, then, progressive weight bearing as tolerated. The patient is referred to the Rheumatologic Department for treatment of high blood uric acid levels, with good results.

At 24-month follow-up, he had neither symptoms nor signs of recurrence.

Conflict of interests: The authors have reported none.



▲ **Figure 1.** Feet anterior-posterior and oblique X-rays. They show an image of calcium density and blurred limits on the neck of the fourth metatarsal bone.



▲ **Figure 2.** Three D reconstruction CT scan showing a calcium density, multi-lobulated image that does not involve the plantar metatarsal cortex.



Figure 3. Plantar approach. There is a tumoral lesion of granular looks between the fourth metatarsal bone and the digital flexor tendons.

Discussion

Gout shows a self-limited acute stage with recurrent synovitis crisis and a chronic stage with structural and inflammatory disorders in joints and peri-articular tissues. Once in a while there can be tophi with no gout history. Tophi are monosodium urate crystal bulges surrounded by a granulomatous reaction, which are most frequently seen at hallux metatarsal-phalangeal level, although they can also occur somewhere else, like foot dorsum, sesamoid bones, astragalus bone, scaphoid bone, first metatarsal space, and fifth metatarsal bone.³⁻⁷

There are neither reports of tophi at the level of the plantar aspect of the 4M neck, nor are there such of gout onset as Morton's neuroma.

Gout is known as the great pretender of diverse disorders, such as infections, soft tissues tumors, malignant skin conditions, metastasis and neurologic compression syndroms.^{2,8,9-11}

Medical findings in our patient are typically those seen in Morton's neuroma. It is necessary to set out medical differential diagnoses with other causes of metatarsal pain, such as metatarsal-phalangeal instability and synovitis.¹² The images seen in the foot X-ray and the CT scan lead us to evaluation and diagnosis of a calcified bulge.

There are no reports of calcium plantar bulges that cause metatarsal pain and interdigital neuritis. Among the conditions that we have to take into account at the time of analyzing images are bizarre parosteal osteochondromatous proliferation, florid reactive periostitis, osteochondroma, myositis ossificans and parosteal osteosarcoma.¹³⁻²¹

Myositis ossificans affects the elbows, the thighs, the shoulders and the calves; it is rarer in feet and hands. In general, there is history of injuries that cause necrosis and

bleeding. Histological analysis shows a central area with fibrous tissues, an intermediate area with osteoblastic tissue and bone reaction around the lesion.^{15,18,21}

Bizarre parosteal osteochondromatous proliferation is a benign bone lesion that occurs in the third and fourth decades of life. It is all about exophytic bone growth linked to the periosteum that involves neither bone cortex nor bone marrow. It has initially been described in proximal and medial phalanges, and metacarpal and metatarsal bones. It can follow an injury. The rate of post-operative recurrence is high.¹³⁻²¹

Florid reactive periostitis is almost always very symptomatic and it can have similar radiological looks. Histological analysis shows no bizarre chondroid proliferation. Contrarily to bizarre parosteal osteochondromatous proliferation, it is associated with low recurrence rates.

Osteochondroma stands for 20-50% of all bone tumors. It involves mainly long bones in the lower limbs. Involvement of small bones in feet and hands is lower (10%). It affects metaphyses. The injury can be isolated or multiple. It is made up of cortical bone and bone marrow covered by a cartilage layer, and it shows communication with the bone marrow.^{20,21}

Parosteal osteosarcoma is hardly found in the bones of feet and hands; it is more frequently seen in long bones. Most of them affect the bone diaphysis. It shows stripes parallel to the periosteum and new bone in the core of the lesion.^{18,19}

In view of the diversity in differential diagnoses seen in this case, we performed puncture-biopsy. After histological analysis we performed complete resection by plantar approach. The material was taken to the Pathology Department, where they found urate crystal deposits surrounded by giant cells that looked like gouty tophi.

Conclusions

This case illustrates the variable gout onset. We believe that a considerable amount of both medical and imaging

differential diagnoses should be taken into account. In the case of a symptomatic tophus, in order to get good results it is necessary to perform surgery associated with medical treatment.

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