

# Tarsal tunnel syndrome caused by a talocalcaneal joint amyloidoma in a long-term haemodialysis patient: a case report

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## ABSTRACT

We present a case of tarsal tunnel syndrome caused by an amyloidoma arising from the talocalcaneal joint in a 64-year-old man with a long history of haemodialysis. He presented with numbness in the medial plantar area of the right foot without any antecedent trauma. The numbness was minimal at rest but gradually worsened, causing difficulty, when walking. Paraesthesia was present on the medial sole of the right foot. A positive Tinel-like sign was noted 2.5 cm below the medial malleolus. Magnetic resonance imaging demonstrated a round lesion, 1 cm in diameter, in the calcaneus, which was hypointense on T1-weighted images and hyperintense on T2-weighted images. In addition, a mass, 1 cm in diameter with a signal isointense to that of muscle was found adjacent to the talocalcaneal joint. The medial plantar nerve was decompressed after removing a solid, 1-cm diameter mass from the talocalcaneal joint. At 6 months post surgery, the numbness had

completely resolved. No recurrence was observed at the 24-month follow-up.

**Key words:** amyloidosis; renal dialysis; subtalar joint; tarsal tunnel syndrome

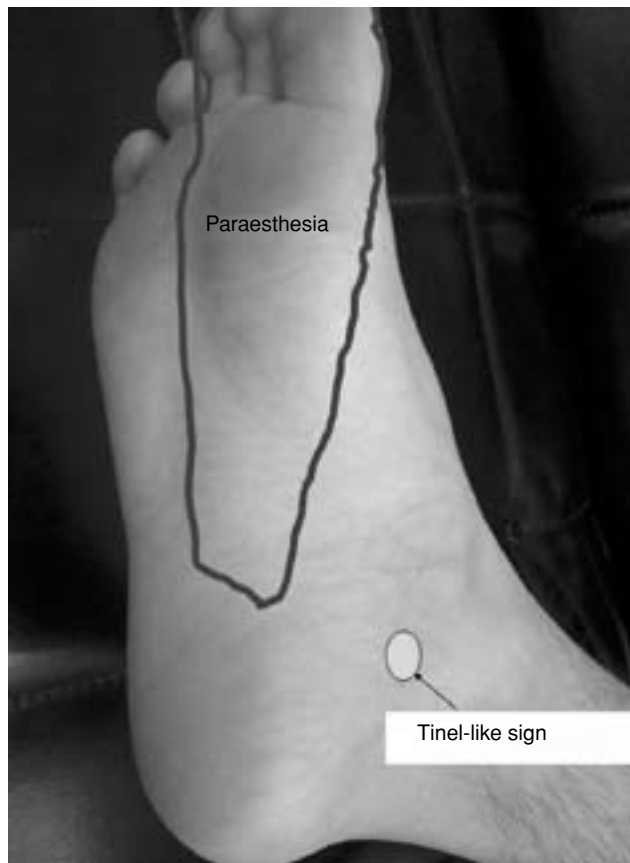
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## INTRODUCTION

With the increasing number of patients on haemodialysis due to chronic renal failure, many complications associated with amyloid deposits in various organs have been reported.<sup>1</sup> We encountered a case of tarsal tunnel syndrome in a patient with a 23-year history of haemodialysis. Operative and histological findings indicated that the syndrome was caused by compression of the medial plantar nerve by an amyloidoma arising from the talocalcaneal joint.

## CASE REPORT

In June 2004, a 64-year-old man presented with a



**Figure 1** Area of paraesthesia (outlined) and the site of the Tinel-like sign (circle) on the sole.

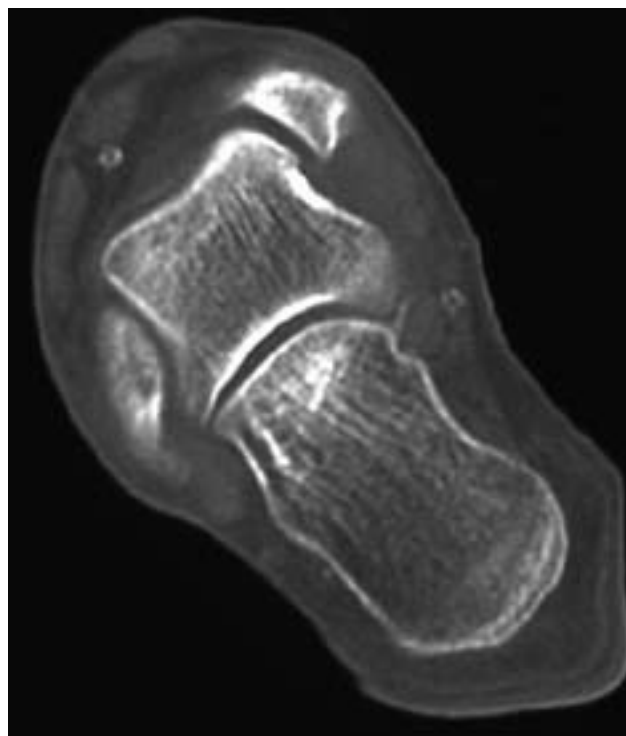
4-month history of numbness in the medial plantar area of the right foot without any antecedent trauma. The patient did not have diabetes, but had been on haemodialysis for 23 years due to chronic renal failure following chronic glomerular nephritis, and had undergone bilateral carpal tunnel release several years earlier. The numbness was minimal at rest but gradually worsened, causing difficulty, when walking.

Paraesthesia was present on the medial sole of the right foot, but no hypoesthesia was apparent. A positive Tinel-like sign was noted 2.5 cm below the medial malleolus (Fig. 1). No motor weakness was observed on ankle dorsiflexion or plantarflexion, or in the flexors and extensors of the toes and great toe.

Radiography (Fig. 2) and computed tomography (Fig. 3) of the foot revealed no tarsal coalition. Round bone cysts were found bilaterally in the femoral neck and head. Magnetic resonance imaging demonstrated no evidence of ganglion cysts along the tibial nerve. In the calcaneus, a round lesion, 1-cm in diameter,

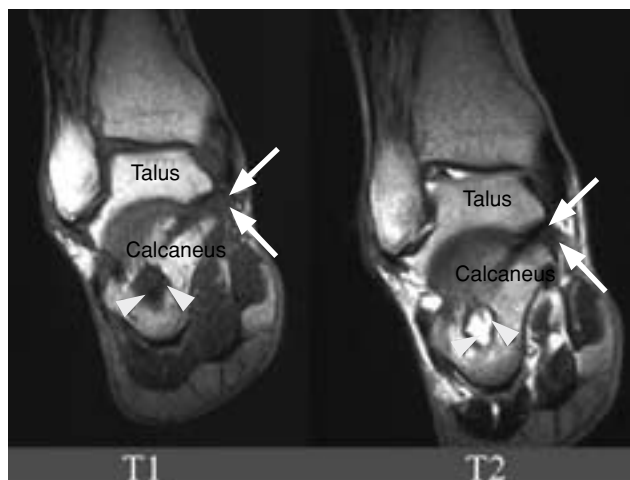


**Figure 2** Posteroanterior and lateral radiographs showing no abnormalities.

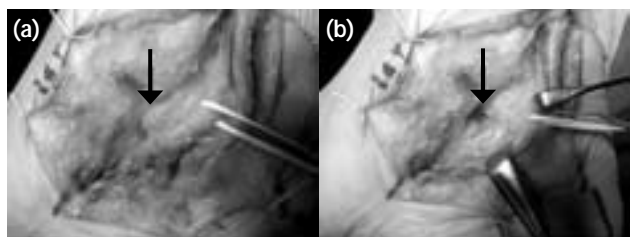


**Figure 3** Computed tomography indicating no tarsal coalition.

hypointense on the T1-weighted image and hyperintense on the T2-weighted image, suggestive of a bone cyst was found (Fig. 4). A mass, 1-cm in diameter, with a signal isointense to that of muscle on the T1- and T2-weighted images was found adjacent to the talocalcaneal joint (Fig. 4). An electrophysiologi-



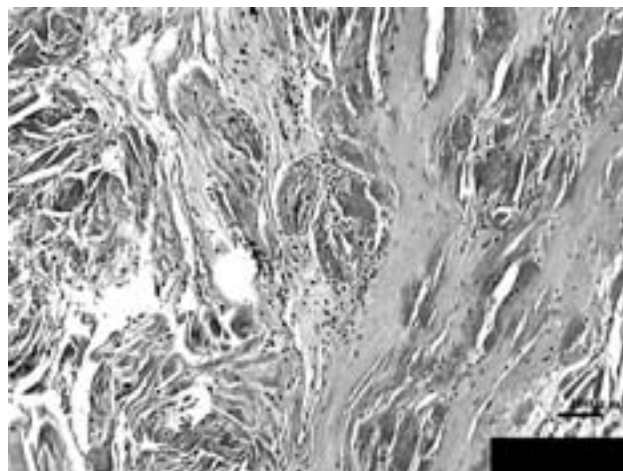
**Figure 4** Magnetic resonance imaging of the right talus showing a bony cyst (arrow heads) at the calcaneus, hypointense in the T1-weighted image and hyperintense in the T2-weighted image. A 1-cm diameter mass with a signal isointense with that of muscle on the T1- and T2-weighted images is found adjacent to the talocalcaneal joint (arrows).



**Figure 5** Intra-operative photographs showing (a) the 1-cm diameter mass (arrow), with the medial plantar nerve (white loop) and tibial vessels protected; (b) the talocalcaneal joint is exposed (arrow) after removal of the mass.

cal examination indicated distal motor latency in the tibial nerve of 5.76 ms on the right and 4.26 ms on the left. Tarsal tunnel syndrome was diagnosed and the patient was admitted for decompression surgery.

Under pneumatic tourniquet control, a curved 10-cm skin incision was made along the course of the tibial nerve. The flexor retinaculum was identified near the medial malleolus. The tibial nerve gave rise to a lateral plantar branch and a calcaneal branch before entering the flexor retinaculum. The medial plantar nerve was identified after releasing the flexor retinaculum. No ganglion cyst nor tarsal coalition was identified in the area. In the flexor retinaculum, the medial plantar nerve was decompressed after removal of a solid, yellow, waxy-surfaced mass, 1-cm



**Figure 6** Histological findings showing eosinophilic amorphous material among the fibrous tissues (Congo red staining).

in diameter, arising from the talocalcaneal joint (Fig. 5).

After formalin fixation and paraffin embedding, Congo red staining revealed eosinophilic amorphous material among the fibrous tissues. The staining disappeared after treatment with potassium permanganate (Fig. 6). The fibrous area was continuous with the fibrocartilagenous tissue and synovium. These pathological findings suggested the mass represented a proliferation of synovium from the talocalcaneal joint.

One month after surgery our patient's sole numbness had decreased and his ability to walk had improved. At 6 months post surgery the numbness had completely resolved. No recurrence was observed at the 24-month follow-up.

## DISCUSSION

Long-term haemodialysis causes amyloid deposition in various organs<sup>2</sup>; with high levels being reported in bone, synovial tissue, and tendon sheaths.<sup>3</sup> 21% of patients on haemodialysis displayed amyloidosis within 2 years, and 33% within 4 years; the increase in amyloid deposition depended on the duration of haemodialysis.<sup>2</sup> However, an amyloidoma representing amorphous amyloid deposition is rare.<sup>4,5</sup>

Tarsal tunnel syndrome has been considered a common nerve entrapment of the lower extremity since it was first reported in 1962.<sup>6,7</sup> The tarsal tunnel has 4 compartments. Tarsal tunnel syndrome

occurs when the compartment of the tibial nerve and posterior tibial vessels is involved.<sup>8</sup> In contrast to the carpal tunnel, flexor tendons run in a different compartment from the nerve. Tenosynovitis, which sometimes causes carpal tunnel syndrome, cannot cause tarsal tunnel syndrome. The main causes of tarsal tunnel syndrome are ganglions, talocalcaneal coalition, trauma, vascular anomalies, scarring, and idiopathic mechanisms.<sup>9,10</sup> Tarsal tunnel syndrome caused by an amyloidoma has not been reported in the English medical literature. Only one such case has been reported in the Japanese medical literature<sup>11</sup> in a patient with an 18-year history of haemodialysis whose amyloidoma arose from the flexor tendon sheath, compressing the medial plantar nerve. The lesion in the present case arose from the talocalcaneal joint, not the flexor tendon sheath.

Various types of sensory disturbance associated with tarsal tunnel syndrome caused by a ganglion have been reported.<sup>10</sup> Patients most often display numbness in the medial plantar nerve area, followed by the entire sole, then the medial and lateral plantar nerve areas, medial plantar, and calcaneal branch area.<sup>10</sup> These variations stem from the variety of branching patterns seen in the tibial nerve. If the main trunk of the tibial nerve is compressed within the tarsal tunnel, the entire sole should be numb. However, if the tibial nerve gives rise to a calcaneal branch before entering the tarsal tunnel, the calcaneal area is spared. In the present case, numbness was limited to the medial side of the sole, because only the medial plantar nerve ran through the tibial tunnel. In a cadaveric study, this type of variation was found in only 7% of cases.<sup>12</sup>

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