



A Plantar Pain

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ABS TRACT

Plantar vein thrombosis is a remarkably rare and underdiagnosed vascular condition that affects the venous system of the foot, particularly the medial and lateral plantar veins. While deep vein thrombosis (DVT) in the lower limbs is relatively common, isolated involvement of the plantar veins has been documented in only a few dozen cases globally. The rarity of this entity, combined with its nonspecific clinical presentation—typically characterized by unexplained plantar foot pain, worsened by walking, and associated with localized swelling—makes diagnosis particularly challenging. Traditional risk factors for DVT, such as prolonged immobilization, recent surgical procedures, and underlying malignancy, are often present, but in plantar thrombosis, mechanical factors such as repetitive microtrauma from tight footwear, high-impact physical activity, or use of orthotics may play a more central etiological role by damaging vascular endothelium and triggering local thrombogenesis.

Given the subtle clinical signs, imaging is crucial for accurate diagnosis. Doppler ultrasound often demonstrates non-compressible plantar veins with absent flow signals, while magnetic resonance imaging (MRI) provides more comprehensive anatomical and functional assessment. Key MRI findings include a lack of contrast enhancement within the thrombosed veins, loss of the normal T2 hyperintense signal, and evidence of surrounding soft tissue edema, which further supports inflammatory changes. In our reported case, a 62-year-old obese woman presented with sudden-onset plantar pain, with MRI revealing thrombosis of the medial plantar veins extending into the posterior tibial veins. Timely diagnosis allowed for the initiation of anticoagulant therapy, which remains the cornerstone of treatment and is essential to prevent further thrombotic complications.

Although rare, plantar vein thrombosis should be considered in the differential diagnosis of persistent or unexplained plantar foot pain, especially in patients with underlying risk factors. Increased awareness among clinicians and radiologists, along with prompt imaging evaluation, can improve recognition and outcomes for this often-overlooked condition.

Keywords: Plantar Vein Thrombosis, Deep Vein Thrombosis (DVT), Foot Pain, MRI Diagnosis.

INTRODUCTION

Plantar vein thrombosis is a rare condition that involves the formation of blood clots in the veins of the foot, particularly the medial and lateral plantar veins. It can be underestimated because its symptoms are often nonspecific and can be confused with other foot conditions such as plantar fasciitis.

Case presentation: A 62-year-old female patient, with severe obesity as a cardiovascular risk factor,

presented with right foot plantar pain of spontaneous onset, evolving over one week. Clinical examination revealed a slightly enlarged right lower limb with exacerbated plantar pain upon mobilization. An MRI was performed (Fig. 1 and 2).

DISCUSSION

Deep vein thrombosis (DVT) of the lower limbs is a common condition, but involvement of the plantar veins is exceptionally rare. Only about forty cases have been reported in the literature (1).

The causes of plantar vein thrombosis are not clearly identified. In addition to the classic DVT risk factors (immobilization, recent surgery, neoplasia, etc.), mechanical stresses on the plantar surface of the foot during physical activities or caused by orthotics or tight shoes, leading to microvascular trauma and activation of coagulation factors, may contribute to its development (1, 2).

The clinical presentation is nonspecific, often involving plantar pain exacerbated by walking and foot edema.

Anatomically, the plantar veins are divided into medial and lateral veins, which drain into the posterior tibial veins. The lateral plantar veins are more predisposed to thrombosis (3).

Imaging is essential for diagnosis. Doppler ultrasound shows non-compressible veins with no detectable venous flow. MRI reveals an absence of vein enhancement following gadolinium injection, loss of physiological T2 venous hypersignal, and abnormal adjacent muscle signal corresponding to perivascular edema (4). In our patient, MRI was performed initially and revealed thrombosis of the right medial plantar veins extending into the posterior tibial veins.

The treatment primarily involves anticoagulation.

Plantar vein thrombosis is rare. Plantar pain is a common symptom and should prompt investigation for plantar vein thrombosis. Both ultrasound and MRI are critical for diagnosis.

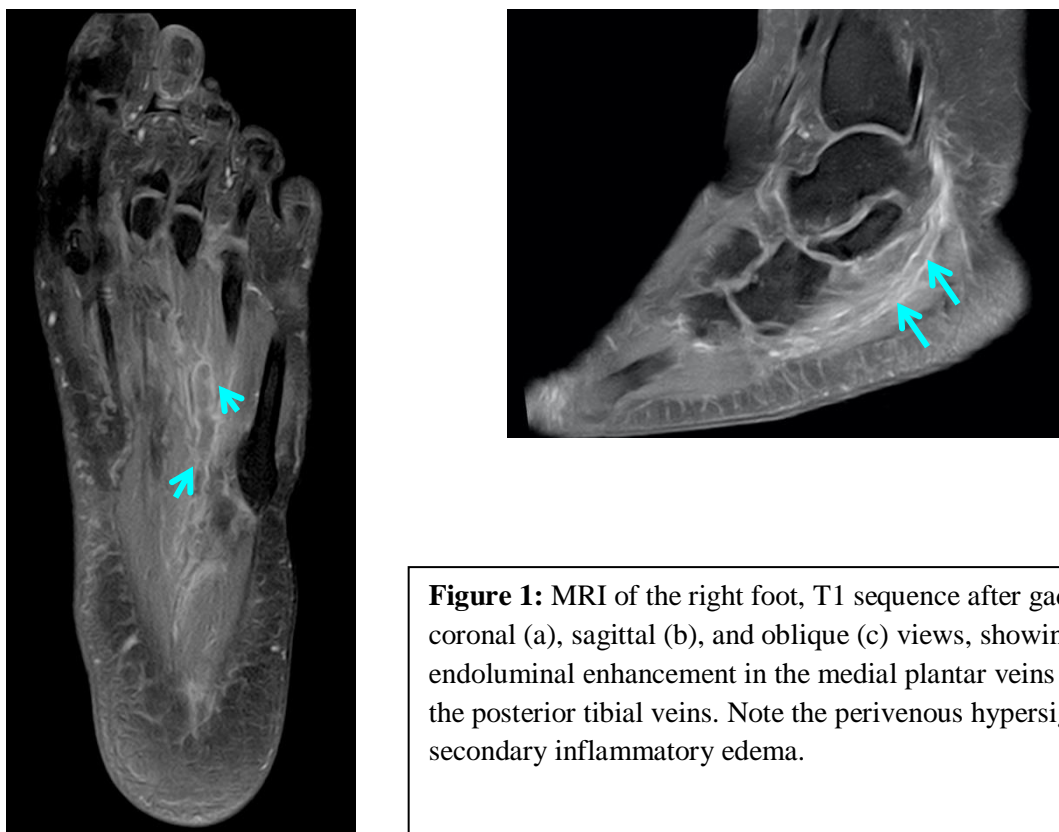


Figure 1: MRI of the right foot, T1 sequence after gadolinium injection, in coronal (a), sagittal (b), and oblique (c) views, showing an absence of endoluminal enhancement in the medial plantar veins (→), extending into the posterior tibial veins. Note the perivenous hypersignal indicative of secondary inflammatory edema.

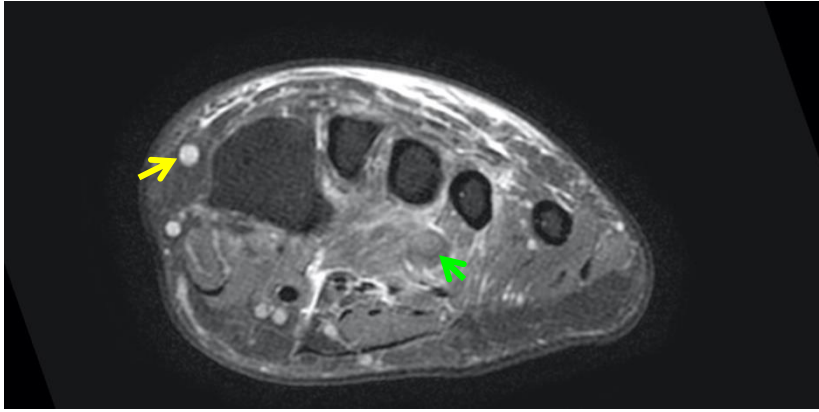


Figure 2: Axial T2 slice with fat saturation showing the loss of physiological T2 hypersignal in the medial plantar veins (→), compared to the superficial veins, which retain their hypersignal (→)

Conclusion

Plantar vein thrombosis is a rare and often overlooked cause of plantar foot pain. Due to its nonspecific clinical presentation, it can easily be misdiagnosed or missed entirely. Imaging, particularly Doppler ultrasound and MRI, plays a crucial role in confirming the diagnosis. Prompt initiation of anticoagulant therapy is essential to prevent thrombotic progression and complications.

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