

## Purpose

Case study describing clinical findings leading to referral with recommendation for diagnostic imaging for suspected plantar fascia rupture.

## Relevance

Plantar fasciitis accounts for ~7-9% of all running injuries and is a well known condition in athletes<sup>1</sup>, while a plantar fascia rupture is a less commonly reported injury<sup>2,3</sup>. Plantar fascia ruptures are usually associated with preexisting plantar fasciitis<sup>2</sup> or previous steroid injections<sup>1</sup>. Other documented risk factors include recent weight change, age related degeneration, shoe wear and activity level<sup>3</sup>. Only a few spontaneous plantar fascia rupture cases have been reported in the literature<sup>2,3</sup>. It has been documented that chronic plantar fascia ruptures may not respond as well to conservative care as those with an acute plantar fascia rupture therefore early diagnosis is important and may optimize outcomes<sup>4</sup>. The purpose of this case study is to assist physiotherapists in diagnosis of plantar fascia rupture.

## Methods

A 32-year-old male presented to a physiotherapist without physician referral with complaint of left plantar foot pain.

**Mechanism of Injury:** ~1 week prior to the initial evaluation, the patient jumped and felt immediate severe pain upon landing. **Subjective signs/symptoms:** unable to weight bear immediately after the injury, progressive plantar foot pain prior to the injury. **Aggravating factors:** walking, ascend/descending stairs, pointing his toes and stretching his foot and calf.

**Objective signs/symptoms:** limited dorsiflexion, pain with resisted plantarflexion and resisted toe flexion, antalgic gait, palpable lump with point tenderness on the medial plantar fascia, and inability to perform a heel raise due to pain.



Based on the clinical examination findings and concerns of a plantar fascia rupture, communication with a sports medicine physician was initiated. The patient was referred to the physician and a MRI was ordered. The MRI confirmed disruption of the medial plantar fascia.

## Results

Differential Diagnoses	Common Signs/Symptoms
Systemic Condition	Bilateral heel pain, male gender, 20-40 years of age <sup>5</sup>
Infection	Diabetic or immunocompromised individuals <sup>5</sup>
Osteoarthritis	Multiple joints, post-traumatic <sup>5</sup>
Calcaneal Stress Fracture	Trauma, positive medial/lateral squeeze test, entire posterior heel tuberosity is tender to palpation <sup>5</sup>
Vascular Insufficiency	Diminished or absent pulses, lack of hair distally, trophic skin changes <sup>5</sup>
Nerve Entrapment	Tenderness at the site of compression, pain occurs after activity <sup>5,6</sup>
Flexor Hallucis Longus Tendinopathy	Progressive worsening symptoms over weeks/months, repetitive contraction of this muscle such as standing on the balls of the feet, running uphill, jumping, hopping, etc
Calcaneal Bursitis	Inappropriate shoe wear <sup>5</sup>
Fat Pad Atrophy	Inappropriate shoe wear, history of immobilization <sup>5</sup>
Plantar Fasciosis	Pain is worst during initiation of ambulation, alleviated with rest, tenderness with palpation over the calcaneal origin, BMI >30, limited dorsiflexion ROM <sup>1,5,7,8</sup>
Plantar Fascia Tear	Mechanism of injury, palpable lump along the fascia, edema and ecchymosis, history of plantar fasciosis, history of steroid injection, point tenderness <sup>1,2,3,4</sup>

Figure 1

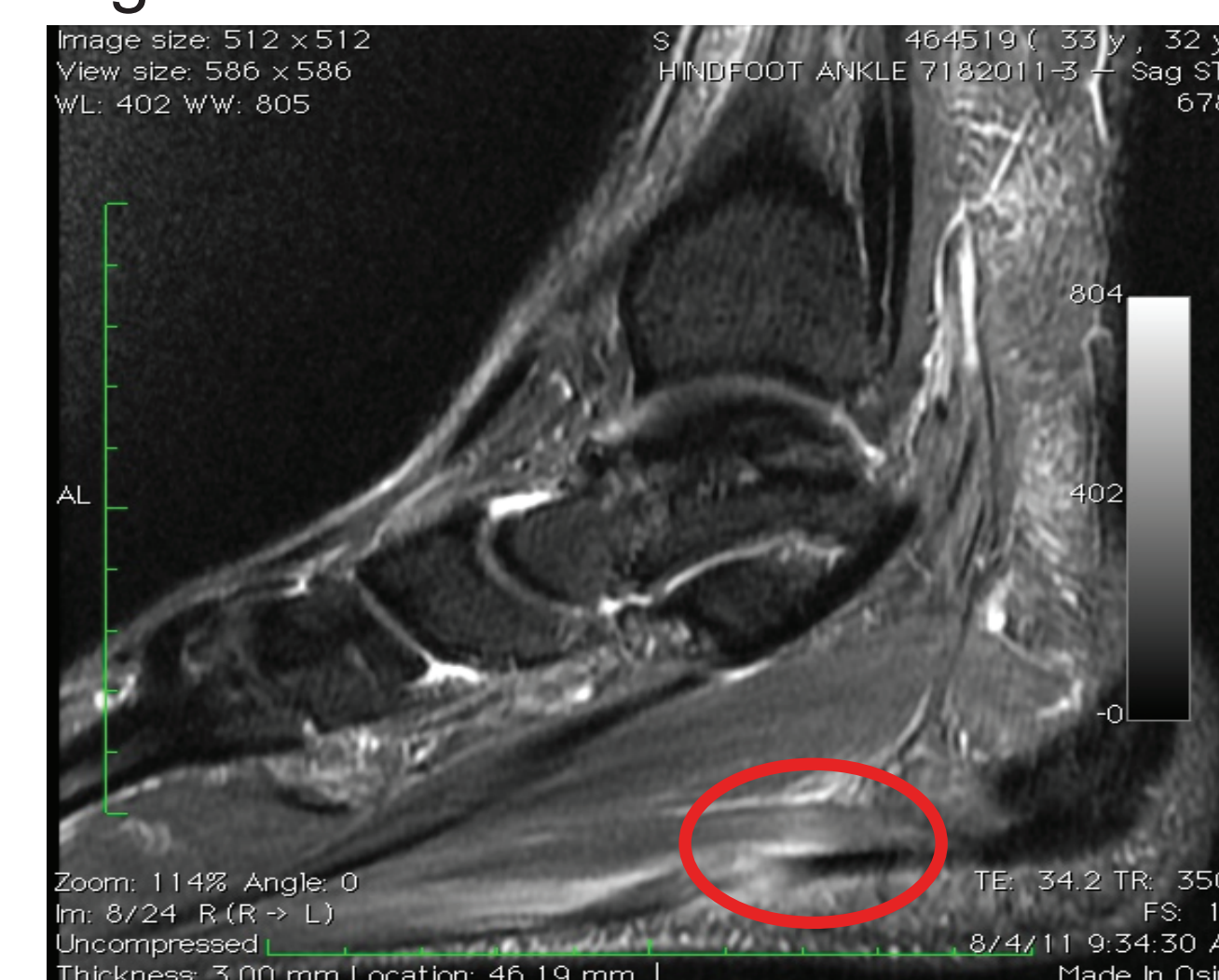


Figure 1 demonstrates discontinuity of the medial band of the plantar fascia and perifascial fluid accumulation using a sagittal STIR image

Figure 2



Figure 2 shows increased signal intensity indicative of edema at the location of the medial band of the plantar fascia using a coronal T2 weighted image

Figure 3



Figure 3 demonstrates the discontinued medial band of the plantar fascia and highlights the corresponding edema using an axial T2 weighted fat saturated image

## Conclusions

This patient presented with findings indicative of a medial plantar fascia rupture with point tenderness, a palpable lump, edema, antalgic gait, pain with stretching and weight-bearing activities and a concurrent mechanism of injury. A suspected plantar fascia tear was confirmed with imaging and treated successfully by a physiotherapist. Initial treatment consisted of immobilization, modalities, joint mobilization, stretching and crutches for pain free ambulation. Treatment then progressed to pain free weight bearing exercises, strengthening, flexibility and sport specific exercises as tolerated. Patient returned to competitive soccer after 16 weeks/15 visits of formal physiotherapy.

## Implications

Plantar fascia ruptures often occur in athletes who are involved in sports requiring running and jumping, and are usually associated with a history of plantar fascia pain, steroid injections, definitive injuries, and concurrent clinical findings<sup>1-4</sup>. The clinical examination is based on knowledge of this rare injury, and although not always obvious, suspicion for a plantar fascia rupture along with clinical signs and symptoms are necessary for making the diagnosis<sup>4</sup>. Rolf stated that a total or partial plantar fascia rupture should be suspected when a patient with a definite injury presents with a tender lump in the sole<sup>4</sup>. If suspected, collaboration with other health care providers should be implemented to determine appropriate conservative management and consideration of diagnostic imaging in order to optimize clinical outcomes.

## References

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