DIFFERENTIAL DIAGNOSIS: WHEN HEEL PAIN IS NOT PLANTAR FASCIITIS

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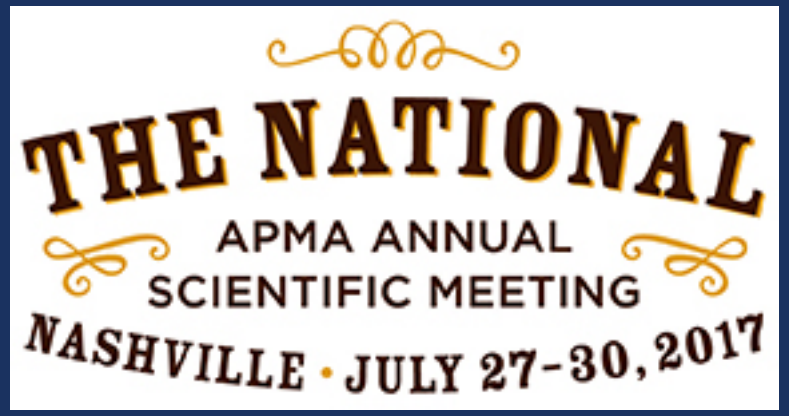


THE HEEL PAIN PATIENT WHO DOES NOT HAVE PLANTAR FASCIITIS

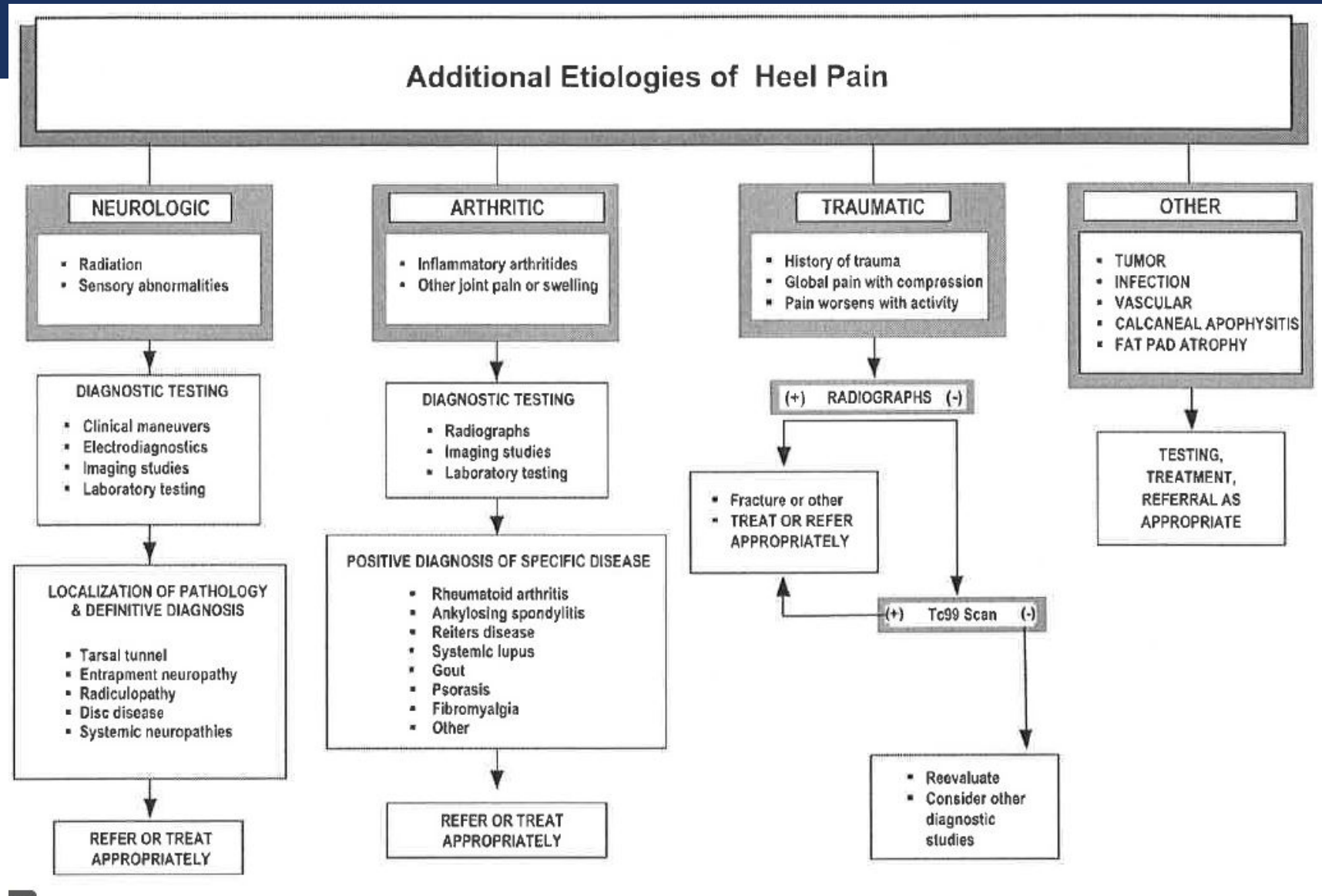
- If every patient who came in with “heel pain” had plantar fasciitis, things would be much simpler.
- We have all had the self diagnosed plantar fasciitis patient, or the “my sister, my aunt, my friend or co-worker” had plantar fasciitis and told me I have it.
- Or the patient who looked up their symptoms online, so it must be plantar fasciitis. Now they’re in the office and your and MA presents with “Mr./Mrs. Smith is here for initial evaluation and their plantar fasciitis”.
- But when is heel pain NOT plantar fasciitis.

POSSIBLE CAUSES OF HEEL PAIN

- plantar fasciitis
- infracalcaneal fat pad atrophy
- medial calcaneal nerve entrapment
- tarsal tunnel syndrome
- RA
- Reiter's
- Ankylosing Spondylitis
- PA
- Sever's

Plantar fascia tear/rupture
Systemic Lupus Erythematosus
Fibromyalgia
Sciatica
Lateral plantar nerve branch to abd digiti quinti
Calcaneal stress fracture
Calcaneal tumors/cyst
Intraosseous edema of calcaneus
Posterior enthesopathies

DIFFERENTIAL DIAGNOSIS ALGORITHM



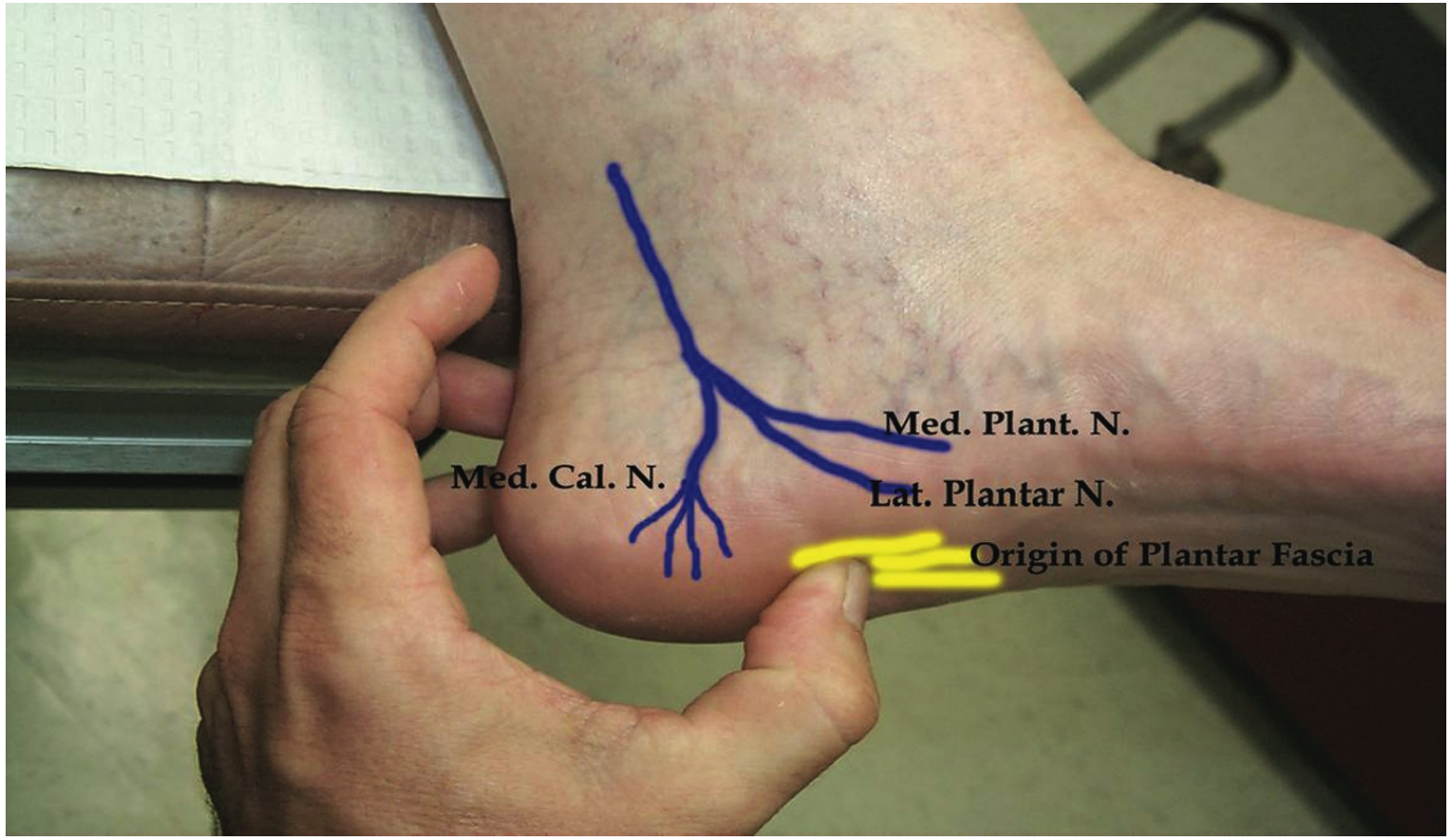
PATIENT HISTORY

- Acute: traumatic, stress fracture, gout or fascial tear/rupture
- Chronic: consider nerve entrapment, fracture, cyst, plantar calcaneal tendon tear
- Bilateral: usually 2/2 systemic disease/etiology
- What makes the pain better or worse? **Fracture**, masses, cyst, **nerve entrapment**, **fascia tear-PAIN WORSE WITH ACTIVITY**. The opposite is true for fasciitis.
- Wearing **orthotics** makes their heel **pain worse**— almost **pathognomonic** for **neurogenic** etiology.

PHYSICAL EXAM OF NEUROLOGICAL HEEL PAIN

- If orthotics made heel pain worse— check for tibial nerve entrapment at the medial ankle and entrapment of the medial and lateral plantar nerves.
- First check Tinel's at the tarsal tunnel. + Just to the foot, or also + to the heel?
- IF + to the heel, test more distal to check medial calcaneal branch/Lateral plantar nerve branch.
- If both are + then both tarsal tunnel and calcaneal nerve entrapment are present.
- MC neurogenic heel pain: UNILATERAL

NERVE ANATOMY PLANTAR HEEL



IMAGING/TESTING MODALITIES

1) X-ray
2) US
3) MRI
4) CT scan
5) three-phase bone scan
6) NCV
7) EMG
8) Neurosensory Testing

TESTING NEUROLOGICAL HEEL PAIN

NEUROLOGICAL TESTING

- that type of sensory device offers **computerized one- and two- point sensory testing**, picking up **lower levels of nerve problems** AND **earlier then EMG/NCV** testing. These devices can **effectively test peripheral nerve entrapment.**

- It works by applying repetitive neurosensory junction paired tactile stimuli to a discrete piece of skin surface, by doing so, it is possible to **identify** the **earliest stage of chronic nerve compression and neuropathy.**

NERVE ENTRAPMENT TESTING REPORT

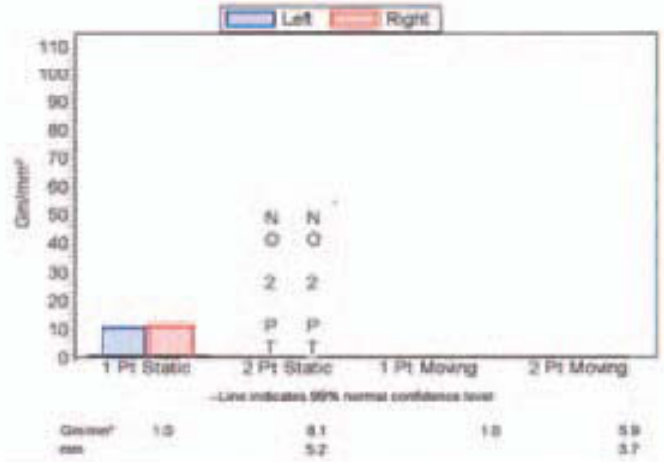
Sensory Management Services — PSSD Report Page

Patient Name: Neuropathy, Diabetic D
Patient ID: PSSD3D — Visit Date: 03/04/2002 — Visit No: 1 — Date of Birth: 01/02/196

NOTE: Underline indicates abnormal Pressure Threshold — * indicates abnormal spacing

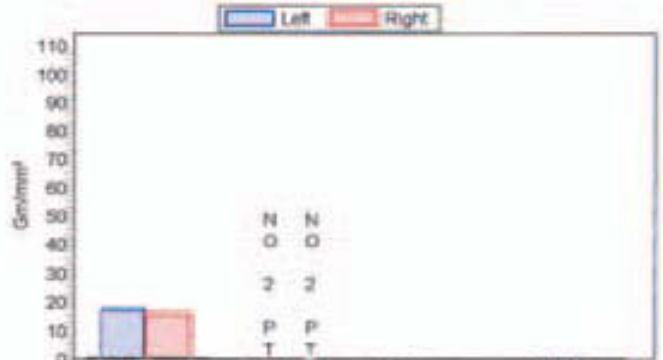
Dorsal Web Space 1/2

	Left Gm/mm²	Spacing mm	Right Gm/mm²	Spacing mm
1 Pt Static	10.8		11.7	
2 Pt Static	110.8	20.0*	105.0	20.0*
1 Pt Moving				
2 Pt Moving				



Great Toe Pulp

	Left Gm/mm²	Spacing mm	Right Gm/mm²	Spacing mm
1 Pt Static	16.1		16.5	
2 Pt Static	106.4	20.0*	110.5	20.0*
1 Pt Moving				
2 Pt Moving				



IMPORTANCE OF NEUROSENSORY MEASUREMENTS

- When used initially helps identify the need to proceed with nerve decompression rather than plantar fasciotomy.

- Also identifies the need to **proceed with fasciotomy** instead of nerve decompression when the **sensibility is normal at presentation.**

OTHER NEUROLOGICAL TESTING

- EMGs and NCVs are **electrical tests** to help diagnose problems that can occur in the peripheral nervous system. ** **most useful** if **peripheral neuropathy suspected.**

- If the nerve compression causes pain and/or sensory changes, but not motor involvement, the EMG/NCV is less useful and probably can not identify this disorder.

NCV TESTING

- peripheral neuropathy occurs when the membrane of the nerve malfunctions 2/2 vascular or internal insult. The signals that propagate up the nerve become disturbed and symptoms of foot **burning and numbness** ensue. **NCV** is **very useful** to determine if this problem exists.

- **NCV** for medial calcaneal nerve can be falsely negative > 50% of the time.

EMG & SWMFW TESTING

- **EMG** records fibrillations and sharp waves that takes 2-3 weeks to show up. If preformed prior to the “golden period”, it will not reveal changes and be much less effective for diagnosing a deinnervated muscle.

- 5.07 SWMFW is ONLY + in VERY LATE STAGE nerve **entrapment** & SEVERE **neuropathy**. SWMFW is also good with suspected back issues.

CAUSES OF NERVE COMPRESSION

- 1) obesity
- 2) venous insufficiency
- 3) space occupying lesions
- 4) trauma

NEUROLOGICAL HEEL PAIN DIAGNOSES

- Tarsal tunnel syndrome (posterior tibial nerve)
- Entrapment of medial calcaneal nerve
- Entrapment of lateral plantar nerve
- Entrapment of the first branch of the lateral plantar nerve (Baxter's nerve)
- Sural, including lateral calcaneal nerve
- Diabetic neuropathy


Orioles

TRAUMATIC HEEL PAIN

- Symptoms usually acute
- MC: FALL FROM HEIGHT -> intra-articular fx
- Other causes:
- calcaneal stress fracture
- planar fascial tear
- plantar fascial rupture

CALCANEAL STRESS FRACTURE

- Stress fractures calcaneus:
- consequence of repetitive load on the heel.
- Exact mechanism unknown. Most patients report increased walking before symptoms.

CALCANEAL STRESS FRACTURE PHYSICAL EXAM

- MC site: immediate posterior and inferior to posterior facet of STJ
- PE: tenderness to LATERAL wall of calcaneus, IMMEDIATE posterior to facet
- PAIN with COMPRESSION of calcaneus.
- ** onset of symptoms frequently precedes x-ray findings**

IMAGING MODALITIES

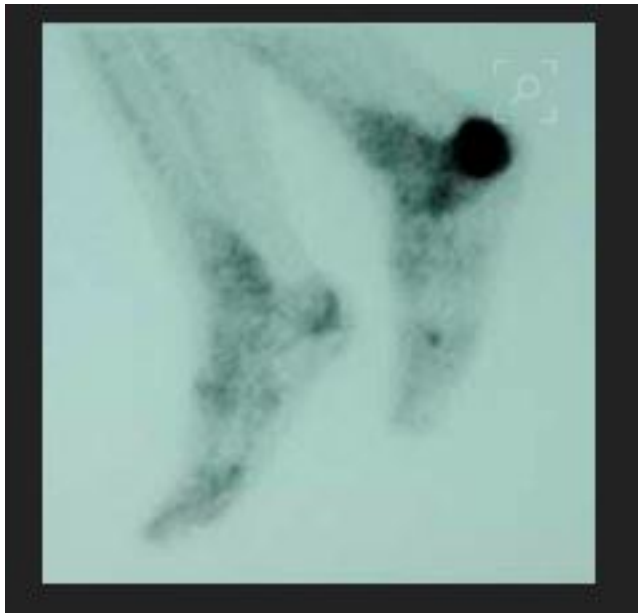
- 1) x-ray: linear sclerosis
- 2) MRI: low signal intensity on T1, bright on T2, fat suppressed T2
- 3) Technetium bone scan: hot in the calcaneus in 3rd phase
- * of note: progression to acute fracture is uncommon.

CALCANEAL STRESS FRACTURE X-RAY

CALCANEAL STRESS FRACTURE MRI

TECHNETIUM BONE SCAN CALCANEAL STRESS FRACTURE

- 3rd phase of Technetium bone scan
- calcaneus hot throughout



PLANAR FASCIAL TEAR/RUPTURE

- Common causes:
  - traumatic
  - corticosteroid injection
  - chronic overuse of fascia

PLANTAR FASCIAL TEAR/RUPTURE
HISTORY & PHYSICAL EXAM

- Immediate sharp, tearing pain in the sole of the foot with activity
- patient feels a “pop”
- bruising
- difficulty to walk on the foot
- swelling

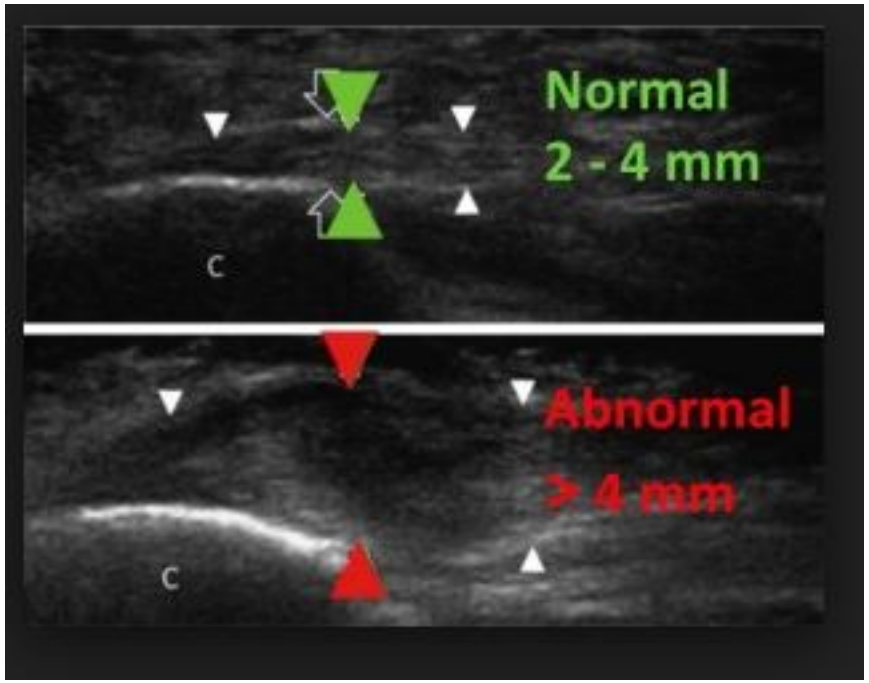
PLANTAR FASCIAL RUPTURE

Figure 1: Bruising in the sole of the foot after plantar fascia rupture

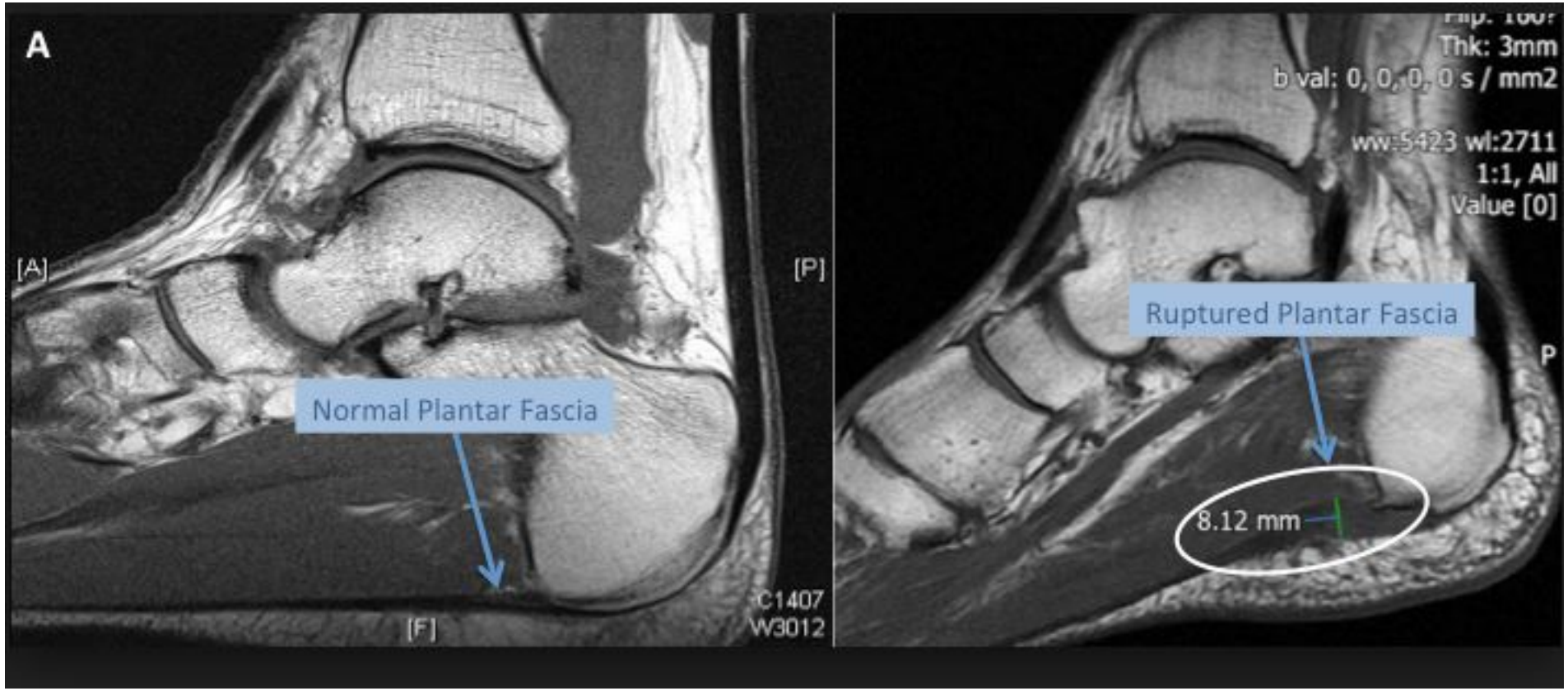
IMAGING PLANTAR FASCIAL TEAR/RUPTURE

- **X-rays:** initially normal.
- **US:** focal fluid filled defects in the fascia with interruption in the normal fibrillar architecture. They can be intrasubstance and/or partial thickness, arising from the deep or superficial margins or be full thickness.
- **MRI:** will show partial or complete tear/rupture.

PLANTAR FASCIAL RUPTURE US



PLANTAR FASCIAL TEAR MRI



PLANTAR FASCIAL TEAR MRI

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