

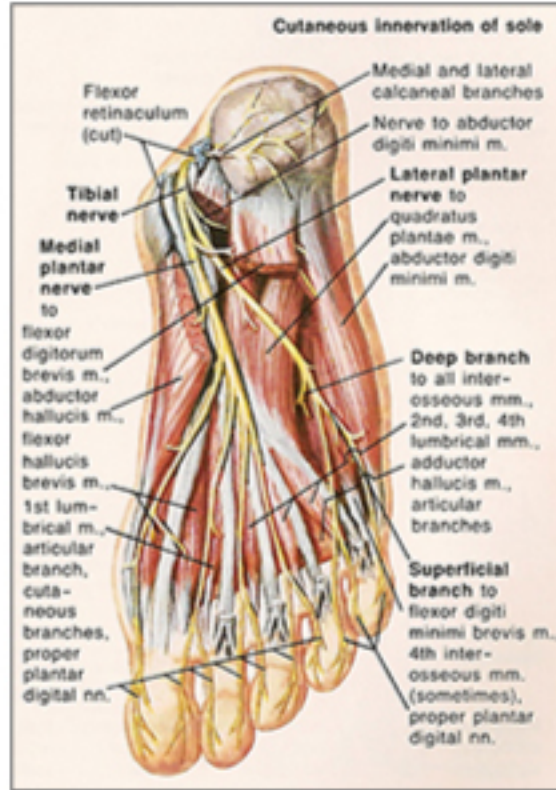
# Medial Calcaneal Neuropathy in Foot and Ankle Pain: A Case Report.

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## ANATOMY OF PLANTAR NERVES:

Medial and lateral plantar nerves are the two major terminal branches of the tibial nerve in the lower extremity. They arise beneath the flexor retinaculum, behind the medial malleolus running deep to abductor hallucis muscle. They give off many distal muscular and cutaneous branches. The lateral plantar branch runs beneath the fascia of abductor hallucis muscle and courses between median portion of quadratus plantae muscle and plantar fascia to innervate the abductor digiti quinti muscle.

The medial calcaneal nerve is the third branch of tibial nerve but it can also arise from lateral plantar nerve as anatomical variation. It lies beneath the lancinate ligament dorsal to the abductor hallucis and supplies cutaneous sensation to plantar and medial aspect of heel.



Tibial		Tibialis Posterior	
		Popliteus	
Medial Plantar		Flexor digitorum longus	Flexor hallucis longus
		Gastrocnemius - median & lateral heads	Soleus
		Flexor digitorum brevis	Flexor hallucis brevis
Lateral Plantar		Abductor hallucis	Lumbricals I
		Abductor digiti minimi	Abductor hallucis Flexor digiti minimi Interossei Quadratus plantae Lumbricals II, III, & IV

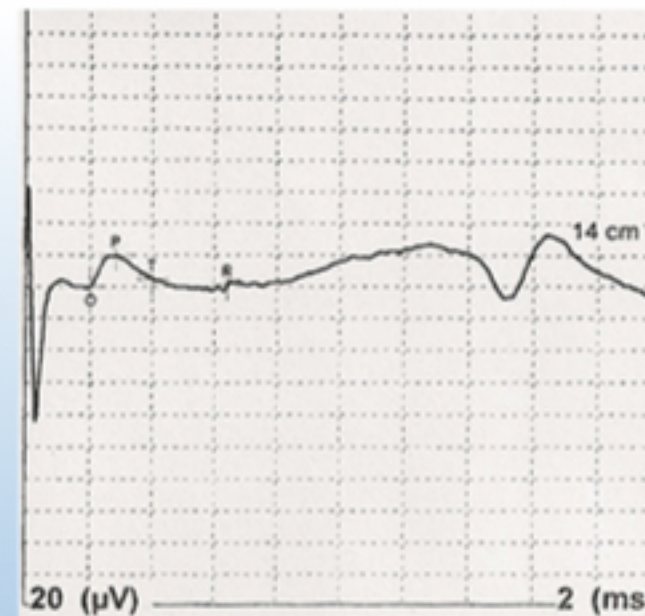
## PAINFUL HEEL SYNDROME

Painful heel syndrome may include tennis heel, jogger's heel, contused heel. Pump bump is heel pain from superficial adventitial bursa formation at posterolateral prominence of calcaneus or inflammation of deep subfascial retrocalcaneal bursa or inflammation of peritendinous lining of achilles tendon. Entrapment neuropathy of the medial, lateral or medial calcaneal branches may cause heel pain. Plantar fasciitis, painful calcaneal bone spurs, subcalcaneal bursitis or periostitis also cause heel pain. Entrapment neuropathy of medial, lateral and medial calcaneal branches of the tibial nerve may potentially cause heel and foot pain. Medial plantar neuropathy in joggers occurs when distal medial plantar nerve is entrapped behind the navicular tuberosity. This is due to prolonged running in valgus posture.

The patient characteristically reports pain on weight bearing which is worse in morning, improves during day and worsens again in the evening. Onset is gradual and patient may or may not associate with any particular traumatic event. Pain may be mild to severe and it may be burning, knifelike, dull achy associated with numbness and paresthesiae in case of neuropathy. It may be weeks to months before the patient seeks any treatment. Heel pain is most often medial (91.8%) and central (7.4%) and medial & lateral (0.8%). True lateral heel pain is rare. (Lapidus Ref. 1)

## CASE REPORT:

51 year old patient injured right foot with roofing nail in 10/08. She complains of swelling, numbness and tingling in medial aspect of right foot. She has history of diabetes mellitus for 2 years. Diabetes is controlled with oral medication.



## NERVE CONDUCTION TEST:

Normal Sural and Superficial Peroneal latencies bilaterally. Right Medial Calcaneal latency is delayed as compared to left ( R=3.27 ms L=1.47 ms diff=1.80 ms ). Right Medial Plantar motor latency is prolonged ( R=5.23 ms nl=<4.4 ms ). All other motor latencies and NCV's are normal. F waves are within normal limits. H reflexes are normal thereby excluding more proximal neuropathy in bilateral lower extremities.

## TREATMENT OF PAINFUL HEEL SYNDROME

### CONSERVATIVE TREATMENT:

- Anti-inflammatory medications
- Local steroid injections
- Medications for neuropathic pain
- Orthotic devices which may include hard or soft heel cups, arch supports or inserts, foam rubber or plastizole heel pads.

### SURGICAL TREATMENT:

- Aimed at reducing calcaneal bone spur
- Decompress or release fascial or neural tissue

Baxter reviewed surgical results in 26 patients that underwent surgical procedures after failure of conservative treatment for 6 months for recalcitrant heel pain (Ref 2). Of the 34 heels that he operated on, 32 had good postoperative results. Release of deep fascia of abductor hallucis muscle and isolated neurolysis of the nerve to abductor digiti quinti muscle.

Conservative non operative approach to compression neuropathy is recommended at least for 6 months because there is risk of inadvertent division of the plantar nerves during surgery and postoperative nerve stump neuroma may form which can be more bothersome and painful.

## REFERENCES

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