Ankle Nerve Disorder

"Tarsal Tunnel Syndrome"

ICD-9-CM: 355.5 Tarsal tunnel syndrome

Diagnostic Criteria

History: Medial foot pain

Paresthesias Numbness

Physical Exam: Symptoms reproduced with tibial nerve tension test

Symptoms reproduced with palpation/provocation of tibial nerve in tarsal

tunnel

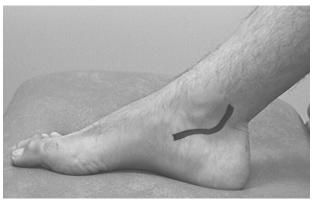


Tibial Nerve Tension Test

Cues: SLR to first resistance

Full dorsiflex and evert the ankle and foot.

Assess symptom reproduction/elimination with alteration to hip flexion



Provocation of Tibial Nerve in Tarsal Tunnel

Cues: Determine ability to reproduce symptoms

Remember Tom, Dick, "an" Harry

T = Tibialis Posterior

D = Flexor Digitorum Longus

A = Posterior Tibial Artery

N = Posterior Tibial Nerve

H = Flexor Hallucis Longus

Tarsal Tunnel Syndrome

ICD-9: 355.5 tarsal tunnel syndrome

Description: An extrinsic or intrinsic compression neuropathy of the posterior tibial nerve or one of its branches. Patients with TTS often report 1) burning pain in the heel and medial arch and/or plantar aspect of the foot, 2) tightness, swelling, and "fullness" in the medial portion of the foot, and 3) sensory disturbances including burning, tingling, and numbness. Pain located around the ankle and extending to the toes is increased with walking and is relieved by rest. Nerve conduction tests demonstrate a time delay across the tarsal tunnel area. EMG may demonstrate fibrillation potential and positive sharp waves in tibial innervated muscles. MRI showed TTS abnormality 88% of time. Positive tinel's sign is a common finding. Mixture of corticosteroids and local anesthetics may be injected for pain relief. Foot taping and the use to orthotics may be used to reduce pressure on the nerve. If all other treatment fail, surgery (tarsal tunnel release) may be necessary to alleviate pain. There is another less common type TTS, anterior tarsal tunnel syndrome, which entraps the deep peroneal nerve.

Etiology: Any lesion that occupies space within the tarsal region may cause pressure on the nerve and subsequent symptoms. Examples of intrinsic factors include ganglions, tenosynovitis, lipomas, varicose veins, fibrosis, and synovial hypertrophy. Extinsic factors may also place trauma and tension across the flexor retinaculum. Examples include bone fracture, hypertrophic flexor hallucis tendon, or pronation and subtalar eversion, which can stretch the flexor retinaculum and cause a narrowing of the tunnel. Half of the patients who present with tarsal tunnel syndrome relate a history of a previous sprain or ankle fracture. Other causes may include repetitive stress with activities, flat feet, and excess weight.

Physical Examination Findings (Key Impairments)

Acute Stage/ Severe Condition

- Tenderness over the nerve at the tarsal tunnel
- Positive Tinel sign (percussion over the flexor retinaculum of the tarsal tunnel)
- Diminution of two point discrimination and hypothesisas to pin prick
- With prolonged, extreme compression, nerve demyelination with Wallerian degeneration may take place with numbness, muscular weakness, and atrophy

Sub Acute Stage/ Moderate condition

As above: Now when less acute, signs of coexisting foot disorders may be revealed, For example:

- Tight Achilles tendon
- Increased hind foot valgus and the appearance of "too many toes sign"
- Weak or absent inversion of the heel

- Rear foot valgus/calcaneous eversion
- Depressed medial longitudinal arch
- Inability to do unilateral heel raises
- Gait lacks effective push-off

Settled Stage/ Mild condition

As above with the following differences

- Resolving symptoms
- Decreased paresthesia and pain
- Improved pain-free soft-tissue motion along the course of the tibial nerve
- Improved strength of tibialis posterior
- Improved functional activity tolerance; standing and walking

Intervention Approaches / Strategies

Acute Stage/ Severe Condition

Goal: Reduce pain and inflammation and tissue stress

Physical Agents

Ice

Contranst baths

Pulsed ultra sound/ phonophoresis with 0.5 percent hydrocortisone or 2.5 percent

lidocane ointment

Iontophoresis

Interferential current therapy

Orthotics or Taping

University of California Berkeley Laboratory (UCBL) orthosis to improve hind foot alignment

Ankle braces, controlled ankle motion (CAM) walkers

Plantar arch taping to reduce tissue stress

Medial Heel Wedge or Heel Seat – may assist by inverting the heel and removing traction from tibial nerve

Advise regarding footgear, such as the use of wider shoes, may be beneficial

• Therapeutic Exercise

Calf stretching exercises

Nerve mobility exercises

Manual Therapy

Soft tissue mobilization to fascial of myofascial tissues suspected of creating the entrapment

Neural mobilization

Sub Acute Stage/ Moderate Condition

Goal: Restore muscle strength and flexibility

As above with following differences

• Therapeutic Exercise

Posterior tibialis strengthening exercise

Settled Stage/ Mild Condition

Goal: Normalize strength, flexibility, and restore lower extremity functional mobility

As above with following differences

• Therapeutic Exercise

Posterior tibialis strengthening exercise in weight bearing.

Selected References

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