

# Tarsal tunnel syndrome

## What is tarsal tunnel syndrome? <sup>[1]</sup>

Tarsal tunnel syndrome is an entrapment neuropathy of the posterior tibial nerve as it passes in the anatomical tarsal tunnel, which lies posterior to the medial malleolus and beneath the retinaculum of the flexor muscles of the foot.

- Anterior tarsal tunnel syndrome refers to compression of the deep peroneal nerve. It is rare and causes pain, weakness, and sensory changes of the foot and ankle. <sup>[2]</sup>
- Distal, or posterior, tarsal tunnel syndrome is caused by compression of the first branch lateral plantar nerve or the medial calcaneal nerve and presents with heel pain. <sup>[3]</sup>

## Causes of tarsal tunnel syndrome (aetiology)

Tarsal tunnel syndrome is most common in active adults, but it can also occur in children:

- It is often caused by osteoarthritis, post-traumatic ankle deformities (scar tissue may also restrict movement in the tarsal tunnel and cause nerve entrapment) or tenosynovitis. It may also be associated with rheumatoid arthritis and diabetes.
- Compression may also result from a cyst, lipoma, ganglion, exostosis or neoplasms within the tarsal tunnel.
- People with severely flat feet, or who wear poorly fitting shoes, are at increased risk of developing tarsal tunnel syndrome.
- Trauma to the ankle.

# Signs and symptoms of tarsal tunnel syndrome (presentation)

## Symptoms

- When entrapment compresses the nerve, it causes ankle pain and a burning sensation, numbness and tingling on the sole of the foot. Symptoms are usually unilateral.
- Symptoms may be worse at night.
- The pain tends to be aggravated by prolonged standing or walking, normally worsens as the day progresses and can usually be relieved by rest, elevation or massage.
- Pain may radiate along the sole of the foot, sometimes up into the calf.
- Pain may be aggravated when the ankle is placed in extreme dorsiflexion.

## Signs

- Examination may reveal Tinel's sign (radiating pain following nerve percussion behind the medial malleolus) over the tibial nerve at the ankle. Manual compression for 30 seconds may also reproduce symptoms.
- Examination may reveal wasting of the intrinsic muscles in the medial aspect of the foot and sensory impairment over the sole.
- Two-point discrimination sensory testing may indicate which branch of the plantar nerve is compressed.

## Differential diagnosis

See also the separate [Heel pain](#) article. A variety of soft-tissue, osseous, and systemic disorders can cause heel pain:<sup>[4]</sup>

- The most common cause of heel pain in adults is [plantar fasciitis](#).
- [Achilles tendonitis](#) is associated with posterior heel pain.
- Calcaneal stress fractures are more likely to occur in athletes who participate in sports that require running and jumping.

- Heel pad atrophy may present with diffuse plantar heel pain, especially in patients who are older and obese.
- Lumbar intervertebral disc prolapse.

## Diagnosing tarsal tunnel syndrome (investigations) <sup>[4]</sup>

- The diagnosis is largely clinical with assessment of possible differential diagnoses and any specific underlying cause of tarsal tunnel syndrome.
- Electromyography (EMG) and nerve conduction studies may be helpful in confirming the diagnosis.
- MRI scanning may be used to identify any underlying lesions and the specific site of compression.

## Management of tarsal tunnel syndrome

### Conservative treatment <sup>[5]</sup>

Conservative management, including anti-inflammatory drugs, orthotics, manipulation, physiotherapy and stretching may be beneficial.

- Arch supports, orthotics and wider shoes may successfully relieve the discomfort of tarsal tunnel syndrome.
- If inflammation of the nerve is causing the compression, non-steroidal anti-inflammatory drugs may be beneficial.
- Steroid injections may also be effective.

### Surgery <sup>[1]</sup>

- Surgical decompression by section of the flexor retinaculum should be considered when significant symptoms do not respond to conservative management.
- Success rates range from 44% to 96%.

# Prognosis

Surgical release improves or resolves symptoms of tarsal tunnel syndrome in 85% to 90% of cases.

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## Further reading

- [Kiel J, Kaiser K](#); Tarsal Tunnel Syndrome. StatPearls, Jan 2020.

## References

1. [Kiel J, Kaiser K](#); Tarsal Tunnel Syndrome. StatPearls, Jan 2020.
2. [Dreyer MA, Gibboney MD](#); Anterior Tarsal Tunnel Syndrome.
3. [Fortier LM, Leethy KN, Smith M, et al](#); An Update on Posterior Tarsal Tunnel Syndrome. Orthop Rev (Pavia). 2022 May 31;14(4):35444. doi: 10.52965/001c.35444. eCollection 2022.
4. [Tu P](#); Heel Pain: Diagnosis and Management. Am Fam Physician. 2018 Jan 15;97(2):86–93.
5. [Vij N, Kaley HN, Robinson CL, et al](#); Clinical Results Following Conservative Management of Tarsal Tunnel Syndrome Compared With Surgical Treatment: A Systematic Review. Orthop Rev (Pavia). 2022 Sep 5;14(3):37539. doi: 10.52965/001c.37539. eCollection 2022.

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