



Sinus tarsi syndrome: a cause of lateral ankle pain

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Sinus tarsi syndrome has been described in the past as being poorly understood, but MRI is helping to clarify the underlying aetiologies. Dr Preston presents a

brief review.

Sinus tarsi syndrome is a relatively frequent cause of lateral ankle pain.¹ Other features include a feeling of instability, and there may be a previous history of trauma. It has a number of underlying aetiologies, and the term does not relate to a specific pathology. MRI is helping to clarify the underlying changes within the sinus that may lead to symptoms, which will address the concerns of some experts that the term is inaccurate and the syndrome poorly understood.²

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Anatomy

The sinus tarsi is an anatomical space on the lateral aspect of the ankle, located between the inferior aspect of the talus and the superior aspect of the calcaneus, anterior to the posterior subtalar joint (Figure 1). Contents of the space include fatty tissue, ligaments and blood vessels.¹

There are three intrinsic ligaments in the space that may be involved in severe or recurrent inversion injuries:³

- talocalcaneal ligament, which maintains alignment of the talus and calcaneus
- cervical ligament – lateral to the talocalcaneal ligament
- inferior extensor retinaculum – lateral to the two other ligaments.

Tears of the talocalcaneal and cervical ligaments, in particular, may be associated with sinus tarsi syndrome.⁴ In a cadaveric study of the tarsal sinus, both complete and partial tears of the cervical and talocalcaneal ligaments were described.⁵ The synovial membrane has abundant free nerve endings, which suggests that the sinus tarsi is not only a talocalcaneal joint space but a potential 'source of nociceptive and proprioceptive information on the movement of the foot and ankle'.⁶ Blood vessels in the wall of the sinus tarsi have been studied in anatomical specimens, and increased pressure within the sinus following fibrotic

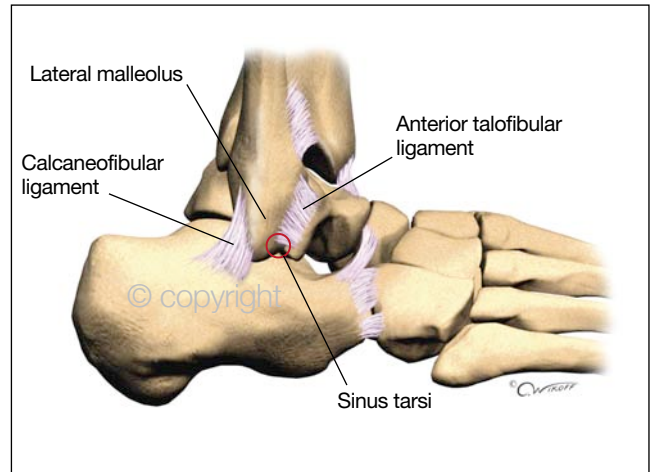


Figure 1. Location of the sinus tarsi on the lateral aspect of the ankle.

changes has been proposed as a possible factor in the development of symptoms in sinus tarsi syndrome.⁷

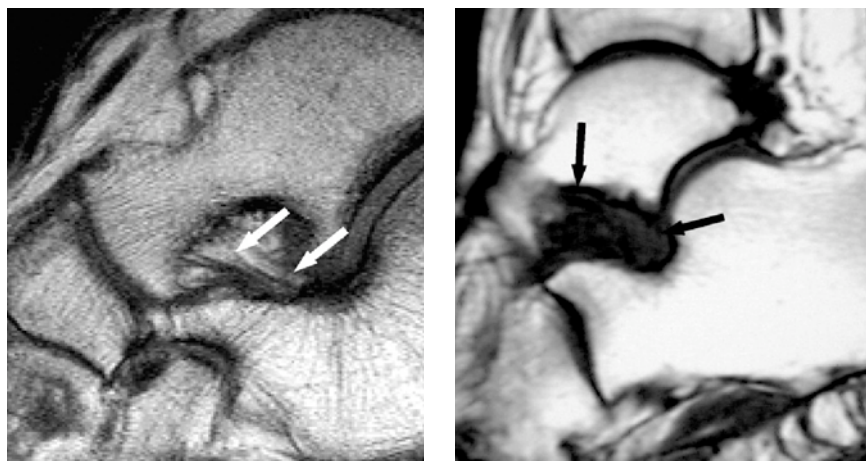
Clinical features

Sinus tarsi syndrome consists of a triad of lateral ankle pain, focal tenderness over

Table. Lateral ankle pain: differential diagnoses

- Inversion ankle sprain causing injury to the talofibular ligament
- Fracture of the distal fibula
- Osteochondritis dissecans – subchondral osteonecrosis of the talar dome
- Osteochondral fractures of the lateral aspect of the talar dome
- Peroneal tendon injuries, peroneal tendonitis
- Os peroneum – an accessory ossicle that may be located plantar to the cuboid bone, lateral to the calcaneus or at the calcaneocuboid articulation³
- Sinus tarsi syndrome
- Systemic diseases affecting the foot and ankle – rheumatoid arthritis, gout, psoriatic arthritis

continued



Figures 2a and b. T1 weighted sagittal MRI of the sinus tarsi. a (left). A normal sinus tarsi containing the intertarsal ligament (arrows) and fat. b (right). A sinus filled with abnormal tissue returning low signal intensity material (arrows) in a patient with sinus tarsi syndrome.

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the tarsal sinus and hind foot irritability. Commonly there is a history of trauma, although it may not be recent. The main symptoms are ankle pain during walking (especially on uneven ground) and a sensation of the ankle 'giving way' without signs of mechanical instability.⁸

Examination findings include tenderness posterior and inferior to the anterior talofibular ligament and reproducible pain with adduction of the hindfoot and supination/inversion.³ Chronic sinus tarsi syndrome may be associated with peroneal spasm and acquired pes planus.³ Injection of local anaesthetic into the tarsal sinus will relieve symptoms, including instability, and is helpful in confirming the diagnosis.

Important differential diagnoses of lateral ankle pain are listed in the Table.

Investigations

Plain x-rays of the region are likely to appear normal. An arthrogram of the subtalar joint in a patient with sinus tarsi syndrome may demonstrate a sac-like anterior bulge of the capsule rather than a normal corrugated appearance.⁸ Other arthrographic findings that have been

described include less marked micro-recesses in the sinus tarsi region, ganglions at the anterior aspect of the subtalar joint and retraction of the joint recesses.⁹ Arthrograms, however, are not routinely performed.

MRI is generally considered to be the most helpful investigation. Findings may include variable abnormal signal intensity, representing fibrosis, inflammatory tissue or synovitis replacing the normal fat within the sinus tarsi (Figures 2a and b).⁴ In one study, abnormalities of the tarsal sinus and canal were found to be highly associated with tears of the lateral collateral ligament.¹⁰ These abnormalities could be categorised according to pathological findings consistent with:

- fibrosis (diffuse infiltration with low T1 and T2 weighted signal intensity)
- chronic synovitis and inflammatory changes (diffuse infiltration with low T1 weighted signal and increased T2 weighted signal intensity)
- synovial cysts (multiple abnormal fluid collections).

Although arthroscopy has been repor-

ted to be helpful in establishing a more definitive diagnosis in sinus tarsi syndrome, it may not be required in addition to MRI. In a study of subtalar joint arthroscopy conducted in 29 patients diagnosed with sinus tarsi syndrome, MRI identified chronic synovitis or fibrosis within the subtalar joint in all patients who underwent imaging.¹¹

Management

Conservative management for sinus tarsi syndrome includes injection of corticosteroid into the sinus, which may provide long term symptomatic relief. Joint protection and provision of appropriate footwear and orthotics may be helpful.¹² Analgesics and NSAIDs are also used.

Although surgical intervention is not commonly required, subtalar joint arthroscopy with synovectomy has been reported to be successful in patients with ongoing symptoms despite conservative therapy.¹¹ At arthroscopy, hypertrophied synovial tissue may be excised with or without reconstruction of the anterior talofibular ligament.

Conclusion

Sinus tarsi syndrome is a combination of symptoms of lateral ankle pain and instability associated with localised tenderness in relation to the anterior talofibular ligament. Patients may have a history of recurrent or severe ankle sprain. The vascular and neuroanatomy of the region has been the subject of study and MRI is clarifying underlying pathologies, including synovitis, fibrosis and ligament injury. Conservative management includes injection of corticosteroid into the sinus, joint protection, analgesics and NSAIDs. Surgical intervention has been reported to be successful when conservative measures fail. **MT**

A list of references is available on request to the editorial office.

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