

Peroneal Tendon Disorders



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KEYWORDS

- Peroneal tendon • Peroneus brevis • Peroneus longus • POPS
- Tendon subluxation/dislocation • Peroneal tendon tears • Peroneal tendoscopy

KEY POINTS

- Pathology of the peroneal tendons must be considered in the differential diagnosis of the patient with lateral ankle pain.
- Symptomatic peroneal tendon injuries can be the result of both acute and chronic processes.
- Peroneal tendon injuries can often be resolved with nonoperative treatment, but if that fails, surgical intervention is usually successful.
- Any surgical treatment of peroneal tendon pathology must address not only the peroneal tendons but also any predisposing structural or anatomic abnormalities for the highest chance of success.

ANATOMY OF THE PERONEAL TENDONS

Knowledge of the anatomy of the peroneal tendons and their associated structures and restraints is critical to understanding their patterns of injury and pathology.

The peroneus brevis originates from the lower two-thirds of fibula and intermuscular septum and runs immediately posterior to the lateral malleolus, superficial to the calcaneofibular ligament, anterior to the peroneus longus tendon, and superior to peroneal tubercle of the calcaneus.¹ Both the peroneus brevis and longus tendons traverse the posterior aspect of the fibula in the retromalleolar sulcus; an anatomic study revealed that this sulcus is concave in 82%, flat in 11%, and convex in 7%.¹ Retromalleolar sulcus shape has not been shown to be significantly correlated with peroneal tendon subluxation/dislocation.² It has been hypothesized that the pressure from the tendons is responsible for the sulcus in the distal fibula.^{3,4} The peroneus brevis tendon has a flattened ovoid shape and inserts onto the styloid process on the base of the fifth metatarsal.¹

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The peroneus longus originates from the upper two-thirds of fibula, the head of the fibula, the tibiotalar intermuscular septum, and the lateral condyle of the tibia.¹ The tendon travels along the posterior aspect of the peroneus brevis tendon, inferior to the peroneal tubercle on the lateral wall of the calcaneus, and then turns medially around the lateral border of the cuboid in the cuboid notch toward the first metatarsal.¹ In a cadaver study, the peroneal tubercle was present in 90% of specimens; its shape was described as flat in 43%, prominent in 29%, concave in 27%, and tunnel shaped in 1%.⁵ The os peroneum is a fibrocartilaginous sesamoid in the tendon on the peroneus longus; it is fully ossified in 20% of feet and exists in the tendon at the point where it wraps around cuboid in the cuboid tunnel, at the lateral border of the calcaneus, or at the calcaneocuboid articulation.^{1,6} The os peroneum provides an increased mechanical advantage, which allows the peroneus longus to plantarflex the first ray. At the point where it articulates with the cuboid, it is anchored into the cuboid notch by 2 medial and 2 lateral ligaments.¹ Just proximal to the cuboid and distal to the peroneal tubercle on the calcaneus is the calcaneal peroneal facet, a well-developed cartilage-covered area with which the peroneus longus tendon articulates.⁶

The peroneus longus and brevis tendons share a synovial sheath starting 2.5 to 3.5 cm proximal to the tip of the fibula and then separate into their own, separate sheaths at the level of the peroneal tubercle. In 15% of patients, the shared peroneal tendon sheath communicates with the ankle or subtalar joint through which synovial fluid can pass.¹ The peroneus brevis has a long musculotendinous junction that may extend inferior to the ankle joint and occupy space in tendon sheath, leading to pathologic conditions such as tenosynovitis, superior peroneal retinaculum (SPR) damage, and chronic tears.¹ The peroneus longus tendon runs in a second peroneal sheath, the plantar peroneal tunnel, as it travels anteromedial toward its insertion on the base of the first metatarsal and medial cuneiform.¹

The tendons lie laterally to the subtalar joint line and function to plantarflex the ankle and evert the foot. Almost 28% of hindfoot eversion power comes from the peroneus brevis and 35% of power comes from the peroneus longus.¹ In addition, the peroneus brevis is the primary abductor of the forefoot, while the peroneus longus also plantarflexes the first metatarsal.¹ Both muscles are active stabilizers in inversion-supination ankle sprains, and the peroneus longus is a passive stabilizer of the ankle during inversion-supination.⁷ At 15° to 25° of plantarflexion, the tendons are perched along the distal fibula and prone to injury with inversion.^{8,9} Both muscles are innervated by the superficial peroneal nerve proximally in leg and get their blood supply from the posterior peroneal artery.¹ Both tendons have a hypovascular zone where they wrap around the tip of the fibula, with the peroneus longus tendon having an additional hypovascular zone at the cuboid notch; not surprisingly, these are common areas of injury.¹ The peroneus quartus is an anomalous muscle that exists in 6.6% to 22% of subjects. This muscle originates from the peroneus brevis and travels through the shared tendon sheath to insert onto the peroneal tubercle and has been implicated in several peroneal tendon disorders.¹ This muscle is the most common accessory muscle found in the ankle.

There are multiple stabilizers of the peroneal tendons as they wrap around the lateral malleolus that serve to counteract the forces that would work to sublux or dislocate the tendons anteriorly during plantarflexion. The SPR extends from the posterolateral surface of the fibula 2 cm above its tip to the lateral wall of the calcaneus and/or Achilles and helps to confine the peroneal tendons within the retrofibular groove (**Fig. 1A**).¹ The calcaneal component of the SPR runs parallel to the calcaneofibular component of the lateral ankle ligament complex.¹ The calcaneofibular ligament, which lies deep to the tendons, also helps to stabilize the tendons in the retromalleolar groove.¹⁰ The

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