

PERONEAL PATHOLOGY

Clifford D. Mab, DPM

Peroneal pathology is one of the differential diagnosis for a patient reporting ankle pain. The peroneal tendons are located within the lateral compartment of the leg and are the primary everters of the foot and ankle. There are 2 tendons, the longus and brevis. The peroneal longus inserts at the base of the first metatarsal and the peroneal brevis inserts to the base of the fifth metatarsal (Figure 1).

The lateral ankle is stabilized by the lateral collaterals and peroneal tendons. Acute and chronic ankle sprains can result in peroneal tendonitis, tendonsis, or tears. Patients with chronic ankle instability may develop peroneal pathology due to chronic ankle sprains.

CLINICAL PRESENTATION

Patients with peroneal pathology primarily report pain along the posterior aspect of the fibula where the peroneal tendons course around the distal tip of the fibula. There may be swelling. Pain can be elicited with passive and active range of motion of the ankle, especially during eversion of the ankle. Simon described the peroneal tunnel compression test.¹

IMAGING

Standard radiographs are necessary to rule out a prominent peroneal tubercle and general arthritis of the ankle. However, for full evaluation of the peroneal tendons; a magnetic resonance image (MRI) should be performed. MRI is the gold standard for evaluating soft tissues. Computed tomography (CT) scans are appropriate for evaluation of osseous structures that could be impinging the peroneal tendons. However, the CT scan will not provide an accurate evaluation of the peroneal tendons themselves. At times, it may be difficult to evaluate the peroneals with an MRI if there is internal fixation present in the body. Another alternative is the use of an ultrasound.

On MRI, normal peroneal tendons will have a homogenous, dark-signal intensity without surrounding fluid on the T1- and T2-weighted imaging (Figures 2-4). The

fibula will have a smooth surface on the axial view. The sagittal view can be difficult to evaluate due to the 55 degree magic ankle effect. Generally, the peroneal tendons should be a homogenous, dark-signal intensity. However, due to the magic ankle effect, there could be a false positive in the area where the peroneal tendons curve around the fibula.

Pathologic peroneal tendons generally have 3 appearances on MRI. The axial view should be primarily used to evaluate the integrity of the peroneal tendons. Tendonitis will show increase signal intensity surround the peroneal tendons on T2-weighted images. The peroneal tendons themselves will appear normal (Figure 5). Tendonsis will show increased signal intensity within the tendons on T2- and decrease signal on T1- weighted images (Figure 6). Peroneal tears will show increased signal intensity surrounding and within the tendons. There will be a disruption of the peroneal tendons (Figure 7). Peroneal tendon ruptures will demonstrate complete absence of the tendon (Figure 8).

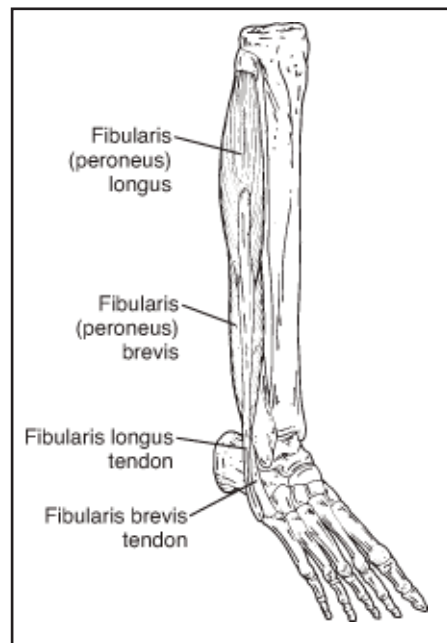


Figure 1. Anatomy of the peroneal longus and peroneal brevis.

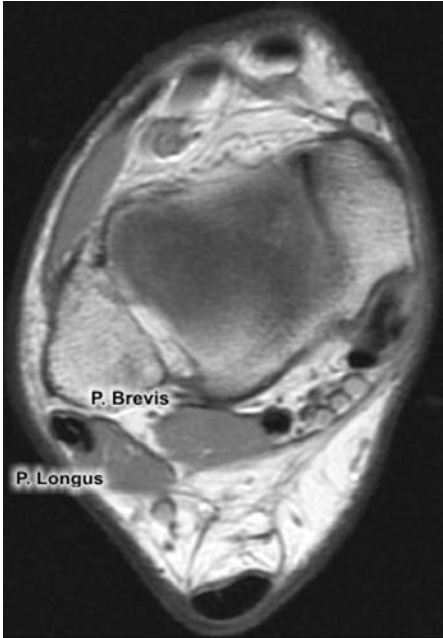


Figure 2A. Axial T1-weighted MRI.



Figure 2B. Axial T2-weighted MRI.



Figure 3A. Sagittal T1-weighted MRI.

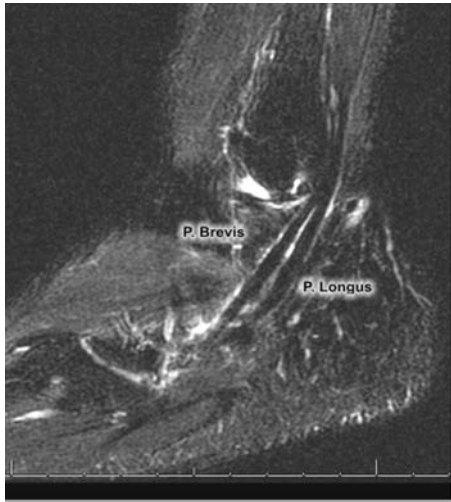


Figure 3B. Sagittal T2-weighted MRI.



Figure 4A. Coronal T1-weighted MRI.

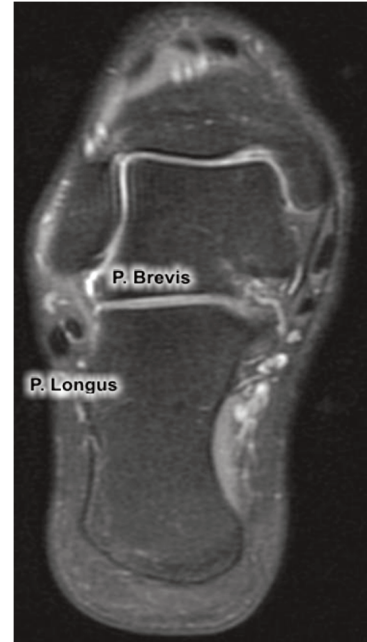


Figure 4B. Coronal T2-weighted MRI.

CONSERVATIVE TREATMENT

Conservative treatment for peroneal tendinopathy includes nonsteroidal anti-inflammatory drugs, cast immobilization, physical therapy, and braces. A simple immobilization regimen one can use is to immobilize the patient in a fracture boot for 2 weeks, followed by a lace-up ankle brace. Generally, tendonitis pain will resolve; however, tendinosis and tears will continue to exhibit pain. Corticosteroid injections should be used with caution, as they can lead to tendon rupture. If a corticosteroid injection is performed, it is recommended that the ankle be immobilized for a short period of time.

SURGICAL TREATMENT

If the patient continues to experience pain after conservative treatment, surgical intervention is the next option. For peroneal tendon surgery, a lateral hockey-stick type incision can be used to access the peroneal tendons (Figure 9). The incision is very versatile in that other procedures such as lateral ankle stabilizations and peroneal groove deepening can be performed. To prevent skin sloughing, it is important to keep the subcutaneous layer thick with the skin.

In patients with chronic peroneal tendonitis; a synovectomy can be performed. Intra-operatively, the tendons will have significant synovitis surrounding the tendons (Figure 10). The synovitis is removed sharply. If you

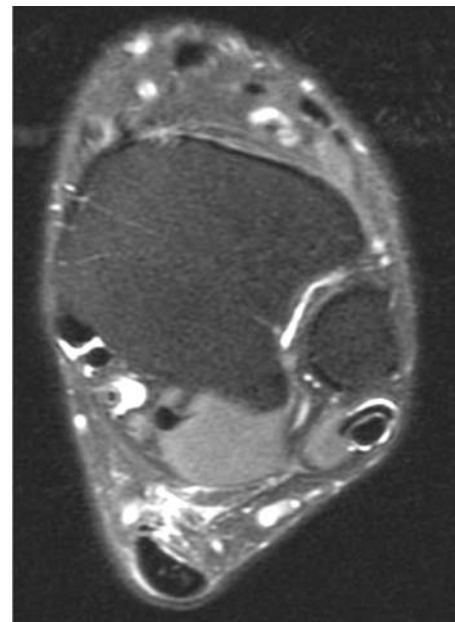


Figure 5. Peroneal brevis tendonitis. Note the increased fluid surrounding the peroneal brevis.



Figure 6A. Peroneal brevis tendonosis. Note the decreased signal intensity in the T1-weighted image

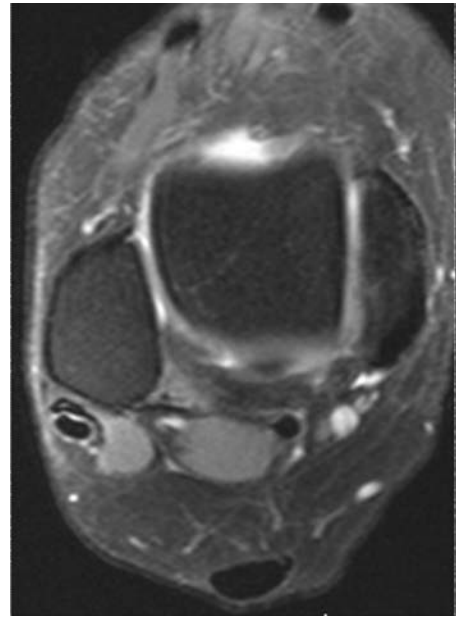


Figure 6B. Note the increased intensity in the T2-weighted image.

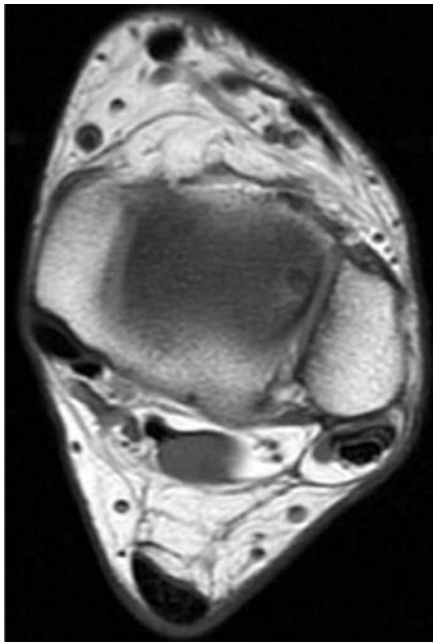


Figure 7A. Peroneal brevis tear, T1-weighted image.

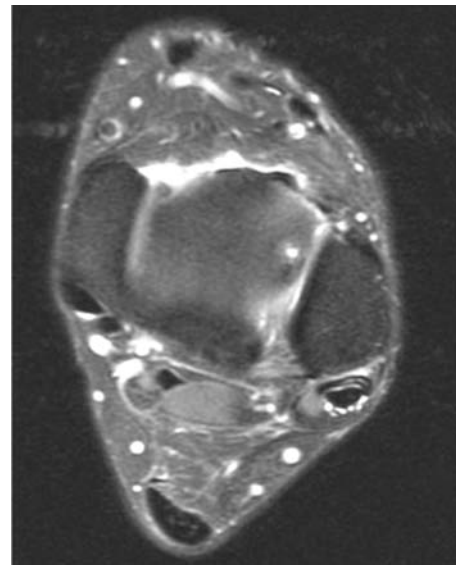


Figure 7B. Peroneal brevis tear, T2-weighted image



Figure 8. Peroneal rupture.

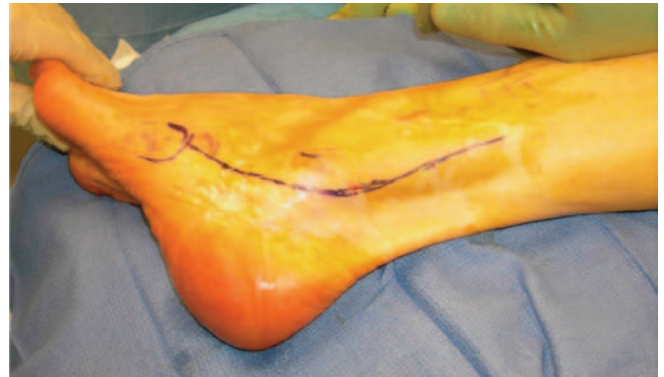


Figure 9. Incisional approach.



Figure 10A. Peroneal synovectomy.

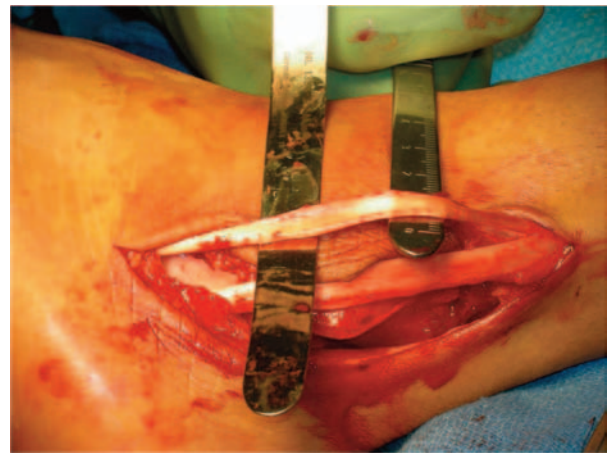


Figure 10B.

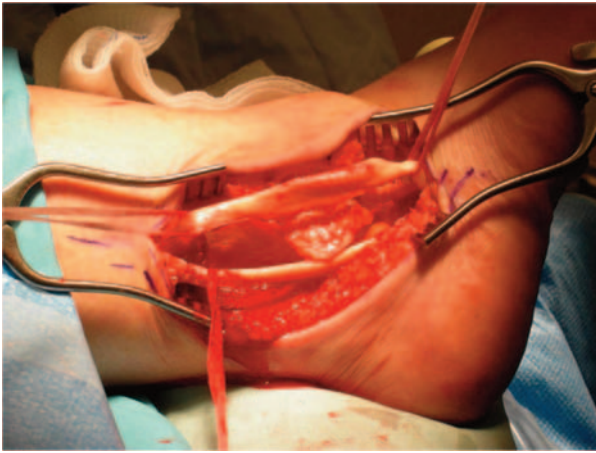


Figure 11A. Peroneal tendons repair.

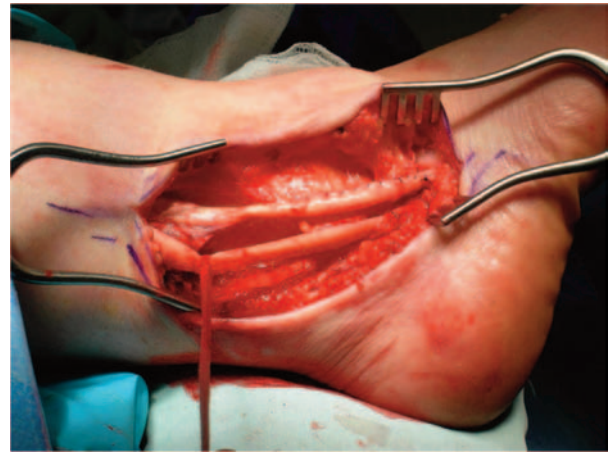


Figure 11B.

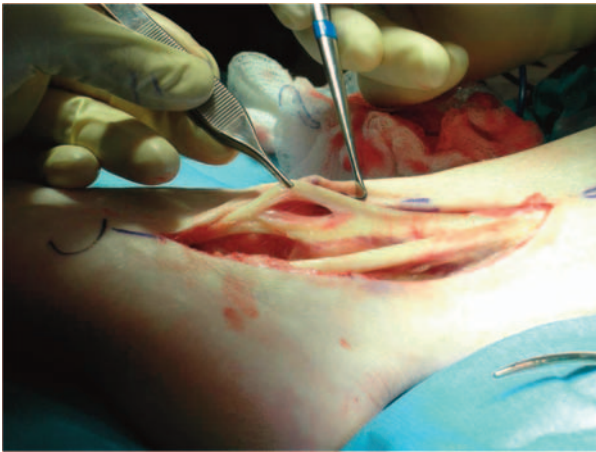


Figure 12A. Peroneal tendon tear repair

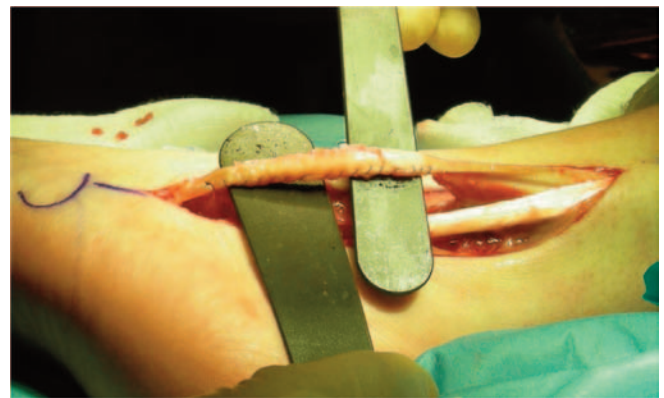


Figure 12B.

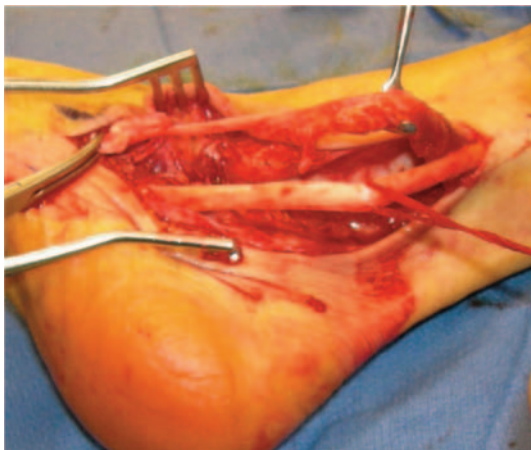


Figure 13A. Peroneal rupture repair: tendondesis.



Figure 13B



Figure 14A. Ankle stress view: talar tilt.



Figure 14B. Ankle stress view: anterior drawer.



Figure 15A. Preoperative view of ankle varus.



Figure 15B. Postoperative view after allograft repair.



Figure 16. Preoperative view of calcaneal varus.



Figure 16B. Postoperative view.

have a low lying peroneal brevis muscle, you can remove the distal end of the muscle.

Peroneal tendonosis will have a bulbous type feel within the tendon. Generally the central portion will be damaged. The damaged tendon is excised and re-tubularized. A non-absorbable suture is used such as 4-0 silk or nylon (Figure 11). Peroneal tears can be debrided and retubularized. (Figure 12). There are allograft products that can be used to help reinforce the tendon repair.

Peroneal ruptures can be repaired through tendon transfer or tendondesis to the other healthy peroneal tendon. Tendon autograft can be obtained from the lateral Achilles, and other peroneal tendon. However, a tendondesis can be performed without much loss of function and mobility (Figure 13).

OTHER CONSIDERATIONS

Other considerations before performing surgical repair of the peroneal tendons include ankle instability, ankle varus, calcaneal varus, and peroneal subluxation. Ankle stress views should be performed to evaluate the lateral ankle ligaments (Figure 14). If there is a positive stress test, it is necessary to perform an ankle stabilization procedure such as a Brostrom. This will help protect the repair of the peroneal tendon.

Ankle and calcaneal varus can be evaluated through plain radiographs (Figures 15, 16). If there is ankle varus, tendon autograft or allograft can be used to help stabilize the ankle. Also, calcaneal osteotomies such as lateral slide and Dywer can be performed to realign the calcaneus.

POSTOPERATIVE COURSE

The postoperative course for isolated soft tissue repair is to be nonweight bearing in a below-knee cast for 4 weeks, followed by 4 weeks partial weight bearing in a fracture boot. A lace-up ankle brace is recommended when returning to full activity. Physical therapy is generally recommended to help increase strength and proprioception of the ankle.

For osseous procedures, an additional 2 to 4 weeks is added to the nonweight bearing period to allow for osseous healing. After the osseous procedure is healed, the same postoperative course is used as for isolated soft tissue procedures.

REFERENCE

1. Sobel M, Geppert MJ, Olson EJ, Bohne WH, Arnoczky SP. The dynamics of peroneus brevis tendon splits: a proposed mechanism, technique of diagnosis, and classification of injury. *Foot Ankle* 1992;13:413-22.