

Simultaneous rupture of the tendons of the short and long peroneal muscles, case report.

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Abstract

Peroneal tendon rupture represents the final stage of peroneal tendon disorders. Despite being relatively common [1], these injuries are frequently underdiagnosed and undertreated due to their vague clinical presentation [2]. This report discusses the case of a 44-year-old man with a history of ankle trauma 10 years prior, initially managed with cast immobilization, who presented later with chronic right ankle pain. Magnetic resonance imaging (MRI) revealed ruptures of both the peroneus brevis and peroneus longus tendons with tenosynovitis. Surgical exploration confirmed the diagnosis, and the patient was treated with long peroneal tendon repair using peroneal brevis tendon graft.

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I. Introduction

Due to their complex anatomy and length, are prone to various pathologies, including tendinitis, subluxation, and tendons ruptures [4]. These conditions can occur sequentially or coexist, often exacerbated by underlying deformities or biomechanical factors that increase mechanical stress on the tendons [3], rupture of one or both peroneal tendons represents the final stage of these degenerative disorders, it's characterized by an insidious onset and a vague clinical presentation [2] therefore a comprehensive clinical evaluation is critical, not only for diagnosing the rupture but also for identifying predisposing deformities that may require simultaneous correction. This approach also aids in ruling out other conditions mimicking peroneal tendon injuries, such as ligamentous damage, fractures, or soft tissue abnormalities.

Advances in imaging, particularly MRI, have greatly enhanced the ability to confirm diagnoses, detect deformities, and identify associated pathologies. Nonetheless, standard radiography remains a valuable tool for initial assessment, particularly for ruling out bone fractures and structural abnormalities.

Early and accurate diagnosis plays a pivotal role in optimizing treatment outcomes. Depending on the severity and location of the rupture, surgical options such as tendon repair or tenodesis may be required to restore function and alleviate pain.

II. Case Presentation:

A 44-year-old male patient presented to the consultation with a history of chronic pain in the right ankle, localized to the lateral aspect. The pain had persisted for two years, with exacerbation during certain activities, and was accompanied by noticeable weakness during eversion. His medical history included an ankle trauma 10 years prior, which had been treated conservatively with cast immobilization. Despite symptomatic management, the symptoms gradually worsened, prompting him to seek medical attention.

On clinical examination, mild swelling was observed around the lateral malleolus, but the patient did not report significant pain at rest. Tenderness was elicited upon passive inversion of the ankle, with noticeable weakness during active eversion 2+ 5. No acute ligamentous injury signs were present, and neurovascular status was intact. The patient exhibited no gross deformities, but the chronicity of symptoms raised suspicion of tendon involvement.

Standard radiographs revealed a lateral calcaneal osteophyte and raised suspicion of a prior calcaneal fracture, Magnetic resonance imaging (MRI) further confirmed tenosynovitis and revealed a complete rupture of both the peroneus brevis and peroneus longus tendons.



Figure 1: Ankle radiograph, anterior and lateral views.

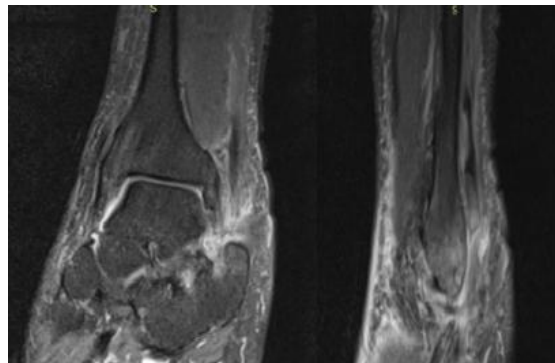


Figure 2: Ankle MRI showing a rupture of both peroneal tendons associated with tenosynovitis.

Given the chronic nature of the tendon ruptures, along with the persistent pain and weakness in the ankle, surgical intervention was recommended. The patient was taken to the operating room for exploration under spinal anesthesia.

The patient was positioned laterally with a thigh tourniquet applied. The incision was made along the peroneal tendon trajectory, extending from the posterior aspect of the distal fibula to the base of the fifth metatarsal.

The surgical exploration revealed a rupture of both the peroneus longus and peroneus brevis tendons, located on the lateral aspect of the calcaneus, with significant degeneration, particularly of the peroneus brevis. An abnormal appearance of the synovium was also noted. A peroperative biopsy was performed, which later confirmed the presence of tenosynovitis.



Figure 3: Peroperative image showing a rupture of both tendons with fibrous degeneration, particularly of the peroneus brevis tendon.

The procedure involved resecting the degenerated portions of both the peroneus longus and peroneus brevis tendons, followed by the transfer of healthy tendon tissue from the peroneus brevis to the peroneus longus to restore functional continuity. A dynamic intraoperative test demonstrated satisfactory stability. Finally, the retinaculum was sutured to prevent any potential dislocation, and the wound was closed with the placement of a Redon drain.



Figure 4: Preoperative image on the left: the peroneus brevis graft, on the right: the peroneus longus after graft placement.

Postoperative Care and Rehabilitation:

Postoperatively, the patient was placed in a short leg cast for 3 weeks to allow for tendon healing and to minimize movement of the repaired tendons. Weight-bearing was restricted during this time. After the cast was removed, the patient began a rehabilitation program that focused on range of motion exercises, strengthening, and proprioceptive training to restore function to the ankle.

The patient had regular follow-up to monitor the healing process. At 6 months post-surgery, he reported significant improvement in pain levels and strength, with the ability to return to his normal activities without discomfort.

III. Discussion:

Simultaneous rupture of both peroneal tendons are rarely reported [1].

They are often underdiagnosed and poorly managed due to their vague clinical presentation, their origin is multifactorial, involving mechanisms such as subluxation of the peroneal tendon, compression of the peroneus brevis tendon between the peroneus longus tendon and the lateral malleolus and anatomical abnormalities as well as acute or chronic injuries caused by mechanical or postural factors, overuse, and foot deformities such as cavovarus.

Persistent swelling along the peroneal tendon sheath is the primary symptom for a brevis peroneal tendon rupture [5]. Retromalleolar pain and ankle instability could be the main complaints [6]. In the case of a rupture of the long peroneal tendon, pain is localized in the cuboid groove or the plantar aspect of the foot where the tendon inserts distally [4]. Passive inversion and resisted eversion may provoke pain, and peroneal muscle strength may be decreased. However, the absence of eversion weakness does not exclude a peroneal tendon rupture.

Radiographs (weightbearing anteroposterior, lateral, and oblique views) are useful for assessing deformities and related bony pathology in the foot and ankle. A rupture of the peroneus longus tendon may sometimes be diagnosed on radiographs by observing the position of the os peroneum [7]. In our case, we were unable to identify the peroneum bone, and we suspect an old fracture of the calcaneus that could be the source of the tendinopathy. Rosenberg noted in his retrospective study the presence of lateral peroneus longus tendon injury in 90% of CT scans performed for intraarticular calcaneal fractures [12]. In fact, calcaneal fractures can be associated with peroneal tendon lesions, and these fractures may be the source of tendinopathy, which can predispose to tendon rupture.

MRI is a valuable diagnostic tool for peroneal tendon pathologies. It helps visualize tendon ruptures, and specific imaging cuts in a parasagittal oblique plane, perpendicular to the tendons, are essential. Imaging the ankle in 20° of plantarflexion aids in separating the tendons and enhances image clarity. However, MRI does not reliably predict the degree of peroneal tendon pathology when compared to intraoperative findings and tends to underestimate the extent of the pathology [1].

Surgical options for peroneal tendon ruptures include : tendon repair, tenodesis, tendon grafting and tendon transfer, Redfern and his colleagues proposed a decision tree guiding tendon repair based on the condition of the tendons and muscle excursion [1], rupture of both tendon is classified as grade 3 injury surgical option are tendon graft and tendon transfer.

Tendon transfer is an option, especially when both tendons are destroyed and irreparable. It has shown satisfactory results, with the flexor hallucis longus (FHL) tendon being the most commonly used. The flexor digitorum longus (FDL) and plantaris tendons are also considered, the tendon is attached distally to the distal tendon stump, it is possible to attach the tendon to the base of the fifth metatarsal using a bone suture anchor, Tendon transfer has the advantage of using autologous tissue, but the muscles may not be strong enough to be a durable and functional substitute for the peroneals [9].

Allograft reconstruction has been advocated for patients with intact proximal muscle excursion, Surgeons prefer their use because it allows the surgeon to address length/size deficits intraoperatively, they help to avoid further surgery, additional incisions, and donor site morbidity and to promote shorter surgical times but some

concerns should be taken, cost and availability, disease transmission, delayed incorporation, and stretching of the graft [8-9].

Autograft is an alternative to allograft. While it involves donor site morbidity and requires a second incision, it offers advantages such as faster reincorporation and tissue compatibility. Nishikawa and his colleagues proposed the semitendinosus tendon autograft as a viable option for peroneus brevis tendon reconstruction, with good early clinical outcomes [8]. Similarly, Anne and his team reported the use of the peroneal quadratus tendon as an autograft for peroneus brevis repair in three cases, with satisfactory results [3].

The use of the peroneal tendon as an autograft is not reported in literature, this approach was chosen in this case due to the destruction of the distal portion of the peroneus brevis tendon, while the distal portion of the peroneus longus tendon remained intact with normal muscle excursion proximally, short term result in the reported case shows that the use of the peroneal tendon as an autograft can be a viable option when possible, especially in our context where allografts are not accessible, offering the advantages of autografts with reduced surgical time and minimal potential complications.

Contributing causes associated pathology should be identified and every effort should be made to treat them [1], so that many authors report reparation of the rupture with associated pathology with excellent outcomes, we cite the arthroscopic repair of the anterior talofibular ligament and endoscopic repair of the superior peroneal retinaculum performed by Tun Hing Lui and his team [10], and a combined Dwyer calcaneal osteotomy and peroneal tendon repair in patients with peroneal pathology complicated by cavovarus deformity performed by Boffeli and his team [11], we believe that the repair Primary, contributing causes, associated pathology may warrant operative repair at the time of peroneal reconstruction.

IV. Conclusion

The use of the peroneus brevis tendon graft successfully restored peroneus longus tendon function and enhanced the patient's functional prognosis. This case could offer new perspectives in the treatment of combined peroneal tendon ruptures; however, further studies are needed to validate the long-term effectiveness of this technique.

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