

Traumatic peroneal tendon dislocation: a case report and surgical treatment options

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SUMMARY

Traumatic peroneal tendon dislocation is a rare but significant injury that predominantly affects athletes. The condition involves the displacement of the peroneal tendons from within the superior peroneal retinaculum around the posterolateral aspect of the fibula. Various surgical options are available to stabilize the peroneal tendons and restore their normal function. We present the clinical case of a 19-year-old male who, after sustaining an eversion sprain during a soccer match, experienced acute pain and difficulty moving his ankle. The availability of different surgical techniques offers the flexibility to choose the most appropriate solution for each specific case.

Key words: peroneal tendon dislocation, surgical treatment

Introduction

Traumatic peroneal tendon dislocation is a rare but significant injury that predominantly affects athletes. The condition involves the displacement of the peroneal tendons from within the superior peroneal retinaculum around the posterolateral aspect of the fibula. First described by Monteggia in 1803 ¹, this injury has since been extensively studied, particularly in the context of sports-related trauma.

Etiology and risk factors

Over 90% of peroneal tendon dislocations occur during sports activities. High-risk sports include skiing, soccer, American football, basketball, running, and ice skating ². Traumatic dislocations often result from an inversion and dorsiflexion injury to the foot and ankle, combined with forceful contraction of the peroneal tendons. This mechanism can lead to an avulsion of the superior peroneal retinaculum, similar to a Bankart lesion in shoulder injuries ³.

Congenital factors, such as hypoplastic distal fibula or laxity of the superior peroneal retinaculum, and acquired conditions like a shallow retromalleolar groove, valgus hindfoot deformities, or hyperpronation, predispose individuals to this condition ⁴⁻⁶.

Pathophysiology

The structure of the retromalleolar groove plays a critical role in peroneal ten-

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don stability. Distally, a fibrocartilaginous periosteal cushion provides adaptation and stress dissipation, but it may also increase the risk of damage during dislocation⁷. Purnell et al. performed a sequential sectioning of the retinacula to evaluate their function in peroneal stability. They found that the superior retinaculum is the important restraining force in holding the peroneal tendons in their normal anatomical position⁸. The degenerative degeneration of the superior extensor retinaculum was believed to contribute to lateral ligament laxity. In this context, the function of the lateral ligaments was examined, while the anterior portion of the deltoid complex and its crucial role in rotational stabilization during pronation-eversion movements were also highlighted^{9,10}. Eckert and Davis categorized the injury into three grades, with grade I (retinaculum and periosteum stripped from the fibula) being the most common¹¹. Furthermore Oden outlines four distinct types of peroneal tendon dislocations and their associated complications¹².

Clinical presentation

Patients often present with lateral ankle pain, snapping, or instability, especially when walking on uneven surfaces¹³. A provocation test involving passive dorsiflexion and eversion against resistance can reveal tendon instability. Chronic cases may exhibit scarring, weak hindfoot eversion, and signs of ligament insufficiency¹⁴.

Diagnosis

Sonography is a highly effective tool for diagnosing peroneal tendon subluxation and detecting associated tendon tears¹⁵.

When the subluxation is reducible, this can be confirmed through physical examination maneuvers and dynamic ultrasound, which allows real-time visualization of the tendons. In the absence of fracture signs on X-rays, these assessments are often sufficient for a definitive diagnosis.

However, when there is significant displacement of the peroneal tendons or suspicion of structural abnormalities, CT imaging becomes crucial. It provides detailed insights, including evidence of tendon displacement on axial views, disruptions in the fibular groove on coronal images, and infralateral fibular bone avulsion fractures indicative of retinacular damage¹⁶.

Surgical treatments

There are a large variety of surgical techniques for the treatment of peroneal tendon instability, each can be addressed to the patient according to his specific pathological and traumatological condition, providing nonpareil advantages and challenges, with the final and common aim of solving the displacement/instability condition by stabilizing the peroneal tendons and restoring it's normal function^{9,11,17-21}.

- One of the most effective approaches for acute and sub-acute cases, is the “Retinaculum repair” combined with “groove deepening”, which consists in reinforcing the superior peroneal retinaculum and it's repair, in addition to a deepening and reshaping of the retromalleolar groove. This approach is capable of delivering outstanding outcomes when performed by surgeon with certain expertise and highly precision, avoiding potential complications including overcorrection and nerve irritation^{24,25}.
- “Bone block” procedures take a more structural approach, repositioning or sliding a fibular bone fragment to stabilize the tendons. This technique is mostly addressed for patients with structural defects, aiming to donate a long term stability. However, it can be technically challenging, and even in the hands of experienced surgeons there could be risks of associated complications, such as nonunion or overcorrection.
- “Calcaneofibular ligament rerouting” offers a less invasive alternative by redirecting the ligament over the tendons to help maintain their position. While it is moderately effective, it may not suffice in cases with significant soft tissue compromise or predisposing anatomical features. Additionally, its recurrence rate is higher compared to other techniques.
- Cases with severe tissue damage could benefit from “Tendon grafting” for the reconstruction of the superior peroneal retinaculum. Grafts, such as the flexor hallucis longus tendon or an Achilles tendon strip, restore stability and functionality. However, this technique carries the risk of donor site morbidity and necessitates a longer recovery period due to graft integration.
- “Suture anchor fixation”, a modern and minimally invasive method, secures the retinaculum to the fibula or calcaneus using anchors. This technique is highly effective, particularly for isolated injuries, and can be performed either openly or endoscopically. While it allows for a smoother recovery, it does involve potential risks related to implant durability, such as anchor loosening over time.
- For simpler cases, the “No Look” technique offers a streamlined, minimally invasive solution by using retention sutures without extensive dissection, groove modification or osteotomy²². This approach minimizes surgical time and morbidity, making it an attractive option for acute, straightforward cases. However, its long-term effectiveness is not well-documented, and it may not be appropriate for addressing complex anatomical abnormalities.

Since acute traumatic peroneal tendon dislocation is frequently associated with intra-articular calcaneal fractures, particularly Sanders grade IV, and a widened heel, a dual incision approach has been described for the repair of peroneal tendon dislocation in cases involving calcaneal fractures²³.



Figure 1. Detecting associated tears in the peroneal tendons.

Case report

We present the clinical case of a 19-year-old male who sustained an eversion sprain during a soccer match, resulting in acute pain and difficulty moving his ankle. On examination, a reducible dislocation of the peroneal tendons was identified and later confirmed by dynamic ultrasound. Surgical treatment was performed three months post-injury (delayed due to personal reasons) and involved the repair of the superior peroneal retinaculum and deepening of the retromalleolar groove.

The procedure began with a straight longitudinal lateral incision along the posterior edge of the lateral malleolus to access the superior peroneal retinaculum and the retromalleolar groove. After confirming the reducibility of the tendons, they were temporarily dislocated to facilitate groove deepening, thereby improving tendon stability. The torn superior peroneal retinaculum was repaired using sutures and further reinforced. The tendons were then reduced, and stability tests confirmed excellent results. The overlying layers were sutured, and the area was dressed and immobilized with a splint.

We chose this technique due to the patient's youth, athletic background, and robust physical attributes, including well developed bone density, musculature, and soft tissue structures. Moreover, the anatomy of the affected area was highly favorable for this surgical approach. Additionally, the absence of chronic structural damage or significant tissue compromise eliminated the need for more complex procedures, such as tendon grafting or bone block surgery. These considerations, combined with the surgeon's extensive experience in managing similar cases, greatly influenced our decision.



Figure 2. Dislocation of the peroneal tendons.

Prognosis and recovery

Timely diagnosis and appropriate surgical management generally yield favorable outcomes. Rehabilitation, including proprioceptive training and gradual return to activities, is essential for long-term stability and function.

Conclusions

Traumatic peroneal tendon dislocation is a complex condition requiring careful evaluation and management. Advances in surgical techniques, such as retinaculoplasty and groove-deepening procedures, have improved outcomes for affected individuals. Ongoing research and refinement of diagnostic and therapeutic approaches are essential to optimize care and enable athletes to return to their sport with confidence.

Conflict of interest statement

The authors declare no conflict of interest.

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Author contributions

MM, MB, GI, FL: surgical treatment and follow-up; AB: write article and review literature; MZ: contribute to write the article.

Ethical consideration

The research was conducted ethically, with all study procedures being performed in accordance with the requirements of the World Medical Association's Declaration of Helsinki.

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