



Non-operative treatment of peroneal split syndrome : A case report

Georgios TZOANOS, Nikolaos MANIDAKIS, Nikolaos TSAVALAS, Pavlos KATONIS

From the University Hospital of Heraklion, Heraklion, Crete, Greece

Peroneal split syndrome refers to longitudinal tearing of the peroneus brevis tendon at the level of the retrofibular groove. It is an increasingly recognized, albeit frequently overlooked, cause of lateral ankle pain. Several surgical options have been documented for managing this entity, however there are no reports emphasizing the role of conservative treatment.

A 48-year-old male patient presented to our department with persistent lateral ankle and hindfoot pain over the past 9 months, following an inversion injury to his right ankle. Magnetic Resonance Imaging demonstrated a longitudinal split of the peroneus brevis tendon. Following peroneus brevis targeted physical therapy, the patient remains symptom free 34 months after his injury.

Diagnostic diligence is required in order to direct treatment to the diseased peroneus brevis tendon, thus avoiding prolonged morbidity. A trial of conservative treatment in lower-demand middle aged patients should be considered.

Keywords : peroneus brevis longitudinal split ; non-operative management.

INTRODUCTION

Disorders of the peroneal tendons such as ruptures, tenosynovitis and dislocations are increasingly being recognized as causes of lateral ankle pain (14). They can occur either in the younger athletic population, following sports injuries, or in the older population (13) as a result of tendon degen-

eration due to attrition, inflammatory arthropathies and steroid injections (20). Isolated longitudinal interstitial tearing of the peroneus brevis tendon (PBT) fibres, the so called “peroneal split syndrome” (PSS), lies within this spectrum of disorders. PSS is not uncommon, as shown in cadaveric studies (9) ; however it is often overlooked (6) and underreported. A better understanding of the disease process and local functional anatomy has resulted in gaining increasing attention in the literature over the past decade (2,3,7,14). Although the surgical management of PSS has evolved, there is lack of evidence regarding conservative treatment of this particular entity.

CASE REPORT

A 48-year-old male patient was referred to the orthopaedic department of our institution due to

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- Georgios Tzoanos, MD, Resident of Orthopaedic Surgery.
 - Nikolaos Manidakis, MD, Resident of Orthopaedic Surgery.
 - Pavlos Katonis, MD, PhD, Associate Professor of Orthopaedics and Spinal Surgery.

Department of Orthopaedic Surgery and Traumatology, University Hospital of Heraklion, Heraklion, Crete, Greece.

- Nikolaos Tsavalas, MD, Resident of Radiology.
- Department of Medical Imaging, University Hospital of Heraklion, Heraklion, Crete, Greece.*

Correspondence : Georgios Tzoanos, Department of Orthopaedic Surgery and Traumatology, University Hospital of Heraklion, Heraklion, Crete, 71110 Greece.

E-mail : tzoanos@hotmail.com

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persistent right ankle and hindfoot pain, following an inversion injury to his right ankle 9 months earlier. He was previously treated with ice, rest, elevation, non-steroidal anti-inflammatory medication and early mobilization, according to his referring physician's instructions, with only partial pain relief. His past medical history was unremarkable, with no report of any older injuries, previous discomfort or surgical procedures to his ankle. He reported being a non-smoker with occasional participation in sports, mainly soccer once a week, prior to his injury, and that pain interfered with walking and mild sporting activities since. He also reported that taping his ankle had provided some pain relief. He did not complain of any symptoms regarding ankle instability or snapping of peroneal tendons.

On examination there was an antalgic gait and mild swelling posterior to the fibula. There was no tenderness over the various parts of the lateral ankle ligamentous complex and no instability elicited on stressing the anterior talo-fibular and calcaneo-fibular ligaments. There was also no peroneal tendon subluxation on actively dorsiflexing and everting the foot. However, this maneuver combined with compression of the superior peroneal retinaculum (SPR) over the retrofibular groove reproduced the patient's pain. The neurovascular status of the foot was normal.

Plain as well as stress radiographs were unremarkable. Magnetic Resonance Imaging (MRI) scan demonstrated a longitudinal tear of the PBT at the level of the retrofibular groove with thinning and fragmentation of the central tendinous portion (Fig. 1). There was also evidence of a healing partial tear of the anterior talo-fibular ligament (ATFL). No associated ankle joint pathology or disruption of the peroneus longus tendon, along its length, was noted. The SPR was also normal.

The patient was treated conservatively with a walker boot for a period of six weeks and a program of physical therapy. The latter commenced with isometric contraction of the peroneal muscles and passive mobilization of the hind and midfoot joints, while the ankle was protected in the boot. Once the orthosis was removed the patient was taught to vertically load his heel, avoiding valgus and in par-

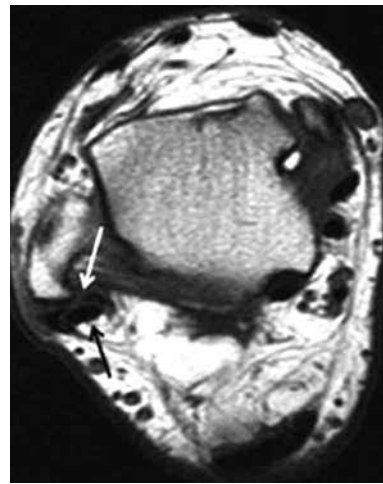


Fig. 1. — Axial T1-weighted image of the right ankle depicts C-shaped configuration of the peroneus brevis tendon with associated thinning and fragmentation of its central portion (*white arrow*). Anterior translation of the peroneus longus tendon into the substance of the peroneus brevis tendon (*black arrow*) is also noted.

ticular varus loads on the subtalar joint. This was complemented by proprioception exercises to his peroneal muscles. At twelve weeks, stretching and strengthening of the peroneal muscles with an emphasis on eccentric loading was initiated. The period of rehabilitation lasted 4 months, eventually leading to complete pain remission. On a follow-up clinical examination, 34 months after his initial injury, the patient remained symptom free with only minor discomfort at the extremes of ankle and subtalar motion. He has resumed his sporting habits, is content with the results of treatment and does not wish to proceed with surgical debridement of the degenerative tendon fibers.

DISCUSSION

The peroneus brevis is the sole evertor of the foot. Longitudinal tears of its tendon can be encountered in young athletes as well as in the elderly (14), but they are frequently overlooked.

The pathophysiology of peroneus split syndrome is closely associated with the anatomical relationship between the peroneal tendons and the SPR, and is not completely understood (3). The peroneal tendons share a common sheath as they pass posterior

to the lateral malleolus, with the PBT located anteromedial to the peroneus longus tendon (PLT) (12). At this level, a fibro-osseous tunnel is formed by the retrofibular groove anteriorly and the calcaneo-fibular, posterior talo-fibular and posterior inferior tibio-fibular ligaments medially, with the superior peroneal retinaculum (SPR) acting as a stabilizer for the peroneal tendons postero-laterally (20). The PBT is prone to tearing at the above level as it is "sandwiched" between the retrofibular groove and the PLT (1). Healing of the tear is prevented by the PLT, which assumes an anterior position into the substance of the PBT. Peroneal split syndrome may also be caused by insufficiency of the SPR with resultant peroneal tendon dislocation, abnormally shallow contour of the retrofibular groove and overcrowding of the fibro-osseous tunnel due to the presence of a peroneus quartus tendon (22), a low-lying peroneus brevis muscle belly (4), the presence of a ganglion (19) or a hypertrophied peroneal tubercle (10). In all cases abnormal rubbing of the PBT on the retrofibular groove with associated longitudinal tear propagation is the end result.

As mentioned above, degeneration of the PBT and tendinitis follow chronic attrition due to the pulley effect and abrupt change in direction of the PBT (15). Isolated acute tears or tears associated with concomitant ligamentous injuries are also possible (1). Ankle sprains with acute tears of the anterior talo-fibular and calcaneo-fibular ligaments pose increased stresses to the peroneal tendons due to anterior and varus instability of the ankle joint. In such cases, treatment guided solely on the injured lateral capsuloligamentous complex will leave the patient with residual symptoms owing to unrecognized peroneal tendon tears (2). In our case there was a concomitant ATFL injury which did not result in clinically detectable instability.

Clinical examination is of paramount importance in assessing these injuries. An evaluation of the lateral ligaments and potential instability of the ankle joint should be conducted. The integrity of the SPR can be assessed by asking the patient to actively dorsiflex and evert his ankle against resistance in order to elicit peroneal tendon dislocation. When this maneuver combined with compression of the

SPR on the retrofibular groove produces retro-malleolar pain, then longitudinal tearing of the PBT is suspected (17). Other clinical findings may include retromalleolar tenderness and oedema, especially in acute cases.

Plain radiographs have a limited role in diagnosing PSS. Confirmation of the diagnosis can be made by MRI scans, especially in the axial plane (21). Typical features include a C-shaped appearance of the PBT encasing the PLT as well as fragmentation and thinning of the central portion of the PBT due to anterior migration of the PLT (20), as seen in our case. Abnormally increased contents of the peroneal fibro-osseous tunnel and the integrity of the SPR and PLT can also be readily assessed; however these were normal in our case.

Based on the MRI findings, Sobel *et al* (17) proposed a classification system for these injuries. Grade 1 tear is a splayed tendon without a discrete tear, grade 2 tear is a partial-thickness split of less than 1 cm, grade 3 tear is a full-thickness split of less than 2 cm, and grade 4 tear is a full-thickness split of more than 2 cm. Grading however correlates poorly with management. Ultrasound examination, which can be highly sensitive and specific in experienced hands (5), was not conducted in our case.

Although recommendations regarding conservative management of peroneal tendinopathies in general have been proposed (16), there are currently no available reports specifically on the treatment of longitudinal tears of the PBT by means of physical therapy. Our patient was treated with protected weight bearing followed by proprioception, stretching, strengthening and eccentric loading, in a similar way to other tendinopathies (8). Recalcitrant cases can be treated surgically by debridement followed by primary repair, tenodesis on the PLT or grafting. Krause and Brodsky (7) suggested that if 50% or more of the tendon remains intact after debridement of the damaged portion, then closing of the split is indicated. Otherwise, proximal and distal tenodesis of the PBT to the PLT should be performed. Associated lesions of the SPR and retrofibular groove and crowding by accessory muscles can be addressed at the time of procedure (6). Tendoscopic procedures (18) as well as the use of acellular dermal matrix allograft for

augmentation purposes (11) have also been used to treat these injuries. Due to the satisfactory outcome obtained by physiotherapy, our patient did not require surgery. We assume that a trial of conservative treatment of PSS in lower-demand middle aged patients should be considered.

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