Brunei International Medical Journal

OFFICIAL PUBLICATION OF THE MINISTRY OF HEALTH, BRUNEI DARUSSALAM

Volume 15 22 June 2019 (17 Syawal 1440H)

CHRONIC LATERAL ANKLE PAIN SECONDARY TO PERONEUS BREVIS INJURY: A CASE REPORT.

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ABSTRACT

The peroneus brevis and peroneus longus are both muscles in the lateral compartment of the leg responsible for dorsiflexion and eversion of ankle. Peroneal tendinopathy including tendinitis, rupture and dislocation has gained attention in the recent literature and is a recognised cause of lateral ankle pain. However, due to the lack of awareness of this condition, diagnosis is often missed and as a result treatment is often delayed, leading to the chronicity of the condition. This is a case report of a young lady presented with chronic left lateral ankle pain with preceding history of ankle inversion injury. Magnetic resonance imaging of her left ankle confirmed an isolated split tear of the peroneus brevis tendon. She underwent a successful peroneus tendon repair and superficial peroneal retinaculum reconstructive surgery with a good clinical outcome after 6 months of outpatient follow-up.

Key Words: Ankle injury, Ankle sprain, Chronic pain, Tendinopathy, Tendon Injury.

Brunei Int Med J. *2019;15:69-72*

ISSN 1560 5876 Print
ISSN 2079 3146 Online

Online version of the journal is available at www.bimjonline.com

Brunei International Medical Journal (BIMJ)
Official Publication of the Ministry of Health, Brunei Darussalam

ISSN 1560-5876 Print
ISSN 2079-3146 Online

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Acknowledgements
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The peroneus brevis and peroneus longus are both muscles in the lateral compartment of the leg responsible for dorsiflexion and eversion of ankle. Peroneal tendinopathy including tendinitis, rupture and dislocation has gained attention in the recent literature and is a recognised cause of lateral ankle pain. However, due to the lack of awareness of this condition, diagnosis is often missed and as a result treatment is often delayed, leading to the chronicity of the condition. This is a case report of a young lady presented with chronic left lateral ankle pain with preceding history of ankle inversion injury. Magnetic resonance imaging of her left ankle confirmed an isolated split tear of the peroneus brevis tendon. She underwent a successful peroneus tendon repair and superficial peroneal retinaculum reconstructive surgery with a good clinical outcome after 6 months of outpatient follow-up.

Key Words: Ankle injury, Ankle sprain, Chronic pain, Tendinopathy, Tendon Injury.

INTRODUCTION

Ankle sprains are not uncommon. Although the daily occurrence is 1 in every 10,000 of the general population, its incidence ranges from 16-21% in sports injuries.[1] It was estimated that 40% of affected patients subsequently developed chronic ankle pain.[2] Despite being a rare entity, it is important to consider peroneus brevis tendinopathy when dealing with lateral ankle pain in addition to more common ligamentous injuries including anterior talofibular ligament injury, calcaneofibular ligament injury, posterior talofibular ligament injury and distal syndesmotic ligaments injury. Symptomatic isolated peroneal brevis tears are rare - their incidence in clinical practice has yet to be determined. However, a recent retrospective study with Magnetic resonance imaging (MRI) discovered an incidence of 35% of peroneal injury in asymptomatic cases.[3] We report here a case of a 30-year-old lady who complained of chronic left lateral ankle pain with preceding history of ankle inversion injury. Diagnosis of peroneus brevis tendon longitudinal tear was made based on MRI findings. The intraoperative findings, surgical technique employed and outcome of the surgery are discussed here.

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CASE REPORT

A 30-year-old woman who has presented with left lateral ankle pain for the past four years reported worsening symptoms in the last 3 months. Further history revealed that she had sustained a left ankle inversion injury four years ago. Upon assessment, she could not weight-bear with her left foot despite taking regular over-the-counter (OTC) analgesics. On examination, there was mild swelling over the left lateral ankle and tenderness over the left

lateral retro-malleoli area. The ankle anterior drawer test was negative. She could not perform forced ankle dorsiflexion and eversion.

An ankle radiograph was performed which revealed no abnormality. We proceeded with an ankle MRI instead of Computed Tomography (CT) as we suspected soft tissue injury based on the unremarkable ankle radiograph and the lack of a recent history of trauma. MRI (Figure 1) revealed an isolated split tear of the peroneus brevis tendon distal to the lateral malleolus with minimal fluid within the tendon sheath. Other ligaments like the talofibular ligament, calcaneofibular ligament and deltoid ligament were intact. The Achilles tendon and plantar aponeurosis were also normal.

The patient then underwent surgery. Intra-operatively, a curvilinear skin incision, as described by Krause and Brodsky was made from the posterior aspect of the distal fibula to the tip of the fibula before curving towards the base of the fifth metatarsal bone, following the course of peroneal tendons.[4] Upon entry, we found that the peroneus brevis muscle was low-lying, extending into the peroneal tunnel. A longitudinal split measuring 7cm in length over the peroneus brevis tendon was discovered upon passing through the superior peroneal retinaculum (Figure 2a). The surrounding structures including the superior peroneal retinaculum, calcaneofibular ligament and anterior talofibular ligament appeared normal. The split tendon was then sutured with Prolene 3/0 and the distal part of the muscle belly and the irregular longitudinal split edge of the peroneus brevis tendon were trimmed off. (Figure 2b) The superior peroneal retinaculum was reconstructed with anchor sutures (3.5mm screw diameter).

Post-operatively, her left ankle was immobilised with a below-knee backslab for 6 weeks, followed by strict non-weight-bearing crutch ambulation. After 6 weeks, ankle range of motion (ROM) exercises were commenced under the supervision of a physiotherapist and she was allowed to weight-bear as tolerated. Upon outpatient follow-up 6 months later, she was able to ambulate pain-free and had regained full range of motion in her left ankle.

DISCUSSION

The peroneus brevis arises from lateral surface shaft of fibula and inserts into the base of

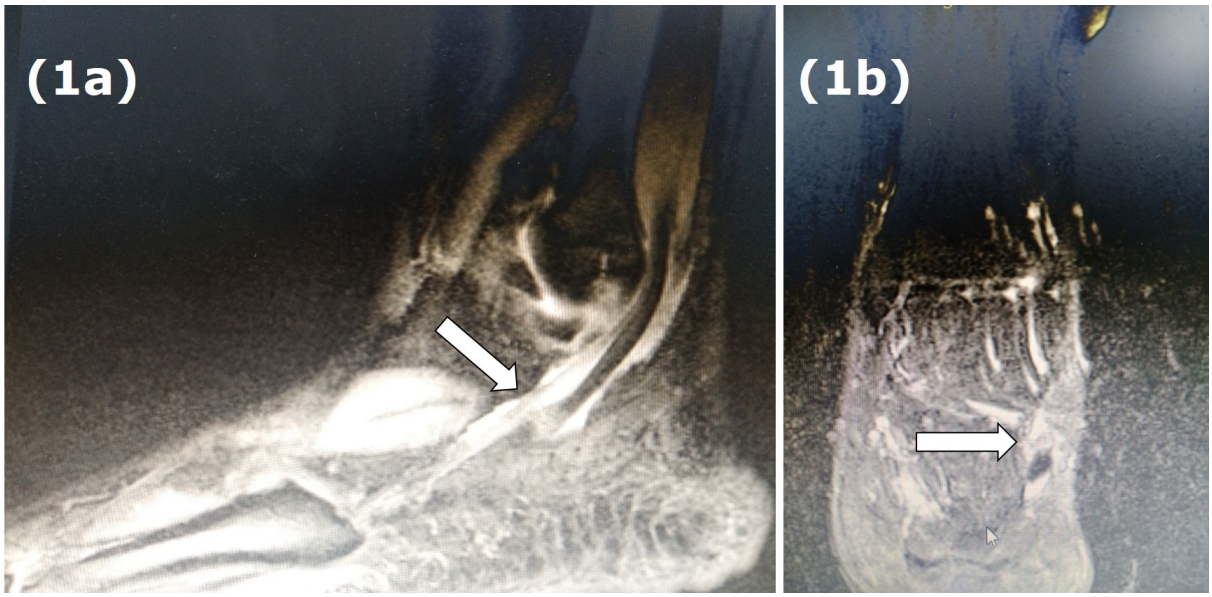

Figure 1: T2 weighted MRI left ankle sagittal view (a) and coronal view (b). Arrows show an oedematous peroneus brevis tendon

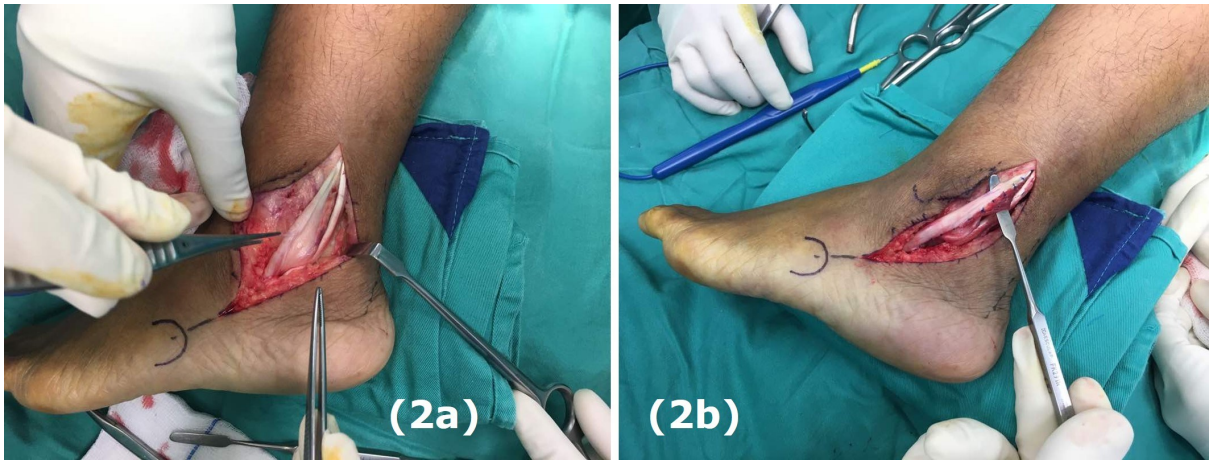

Figure 2: (a) Longitudinal split of the peroneus brevis tendon, (b) Demonstrating the low-lying muscle belly of the peroneus brevis.

the fifth metatarsal bone.[5] It is mainly responsible for ankle plantar flexion and everts foot at subtalar and transverse tarsal joint.[5] Peroneus brevis pass through the retromalleolar groove, a fibro osseous tunnel posterior to the lateral malleolus, where they are held in place by the superior peroneal retinaculum.[6]

Peroneal tendon disorders are an important cause of persistent lateral ankle pain following injury, which may be overlooked on clinical examination. These include tenosynovitis, subluxation, and tendon rupture.[6] Isolated peroneal tendon tears are infrequent and most often follow an inversion injury to the ankle.[7] The proposed pathophysiology of peroneus brevis tendon injury includes forced dorsiflexion, resulting in a longitudinal tear or rarely, a transverse tear pattern.[8] Some have attributed it to misaligned fibula fractures, a torn superior peroneal retinaculum, a low-lying peroneus brevis muscle belly or the presence of a peroneus tertius tendon.[9, 10]

In this case, we postulated that the low-lying peroneus brevis muscle could be the precursor for the peroneus brevis tendon tear as it causes crowding in the retro-malleolar groove, following her left ankle inversion injury 4 years ago. A low-lying peroneus brevis muscle is defined as a muscle belly that extends distally to the superior margin of the superior peroneal retinaculum. It is important to note that the peroneus brevis musculotendinous junction could shift with ankle positioning. Ankle dorsiflexion often causes peroneus brevis muscle belly extension into the retromalleolar groove, and in some cases, so does ankle plantarflexion.

An ankle MRI is the gold-standard modality for demonstrating peroneal tendon injuries. The peroneal tendons are low-signal substances therefore any evidence of heterogenicity or a high signal indicates tendinopathy. MRI also allows assessment of the integrity of surrounding ligamentous structures. In terms of views, the axial view is best for assessment of peroneal tendons whilst the sagittal view is preferable for assessment of the extent and pattern of injury, if present.

Anatomically, the musculotendinous junction of peroneus longus lies higher than the peroneus brevis - this helps to differentiate between them intra-operatively. To manage peroneus brevis tears, many authors have recommended tendon debridement and repair with tubularisation.[11,12] Krause and Brodsky suggested that tubularisation should be reserved for repair of tendons which have a viable cross-sectional area of more than 50% post-debridement.[4] They believe that if less than 50% of the tendon remains post-

debridement, it would eventually rupture due to excessive stress.[4] In cases where more than 50% of the tendon has been debrided, Krause and Brodsky recommended complete resection of the damaged segment, followed by tenodesis of both the proximal and distal parts to the peroneus longus.[4]

CONCLUSION

Peroneus brevis tendinopathy should be considered when assessing chronic lateral ankle pain, especially in patients with a history of ankle inversion injury and lateral retromalleolar pain. A normal ankle radiograph is inadequate to rule out peroneus brevis injury, instead an ankle MRI is needed to establish the diagnosis. Intra-operatively, lateral ankle ligaments should be examined and repaired in the same setting.

Financial disclosure or conflict of interest

The authors of this manuscript certify that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

Consent

We have acquired consent from patient for all photographs of patients' body parts and imaging to be used in publication purpose.

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