

Lateral Retromalleolar Swelling and Pain - Peroneus Brevis Tendon Tear (Boomerang Sign)

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SECTION 2 – ANSWER

CASE

A 25-year-old male complained of sudden-onset pain and swelling over the lateral side of the ankle joint in the retromalleolar region. The patient was an athlete and had a history of playing football the previous day. The pain worsened with activity. A dynamic ultrasound scan of the lateral retromalleolar region was performed, and the ultrasound images were obtained in short- and long-axis planes [Figure 1 and Video 1]. What is your impression?

INTERPRETATION

An ultrasound image of the lateral retromalleolar region of the ankle is showing splitting of peroneus brevis (PB) tendon with the insinuation of peroneus longus (PL) tendon into the gap formed by the split PB giving the characteristic “boomerang sign” [Figures 1a and 2]. On the long-axis view, one can see the “hemi-tendons” of the PB on either side of the PL tendon [Figure 1b]. Magnetic resonance imaging (MRI) of the ankle was also performed to look for any ligamentous injury. On MRI, similar findings were noted [Figure 3] on proton density fat-saturated sequence in the axial and coronal planes. No other ligamentous injury was identified.

DISCUSSION

Musculoskeletal ultrasound is widely used to diagnose muscle, tendon, and ligament pathologies.^[1,2] Peroneal tendon injuries are common in practice, especially with the rise of older participants in athletic and sports activities. The history of antecedent trauma is not present in many cases. Peroneal tendon injury is documented in 35% of asymptomatic cases

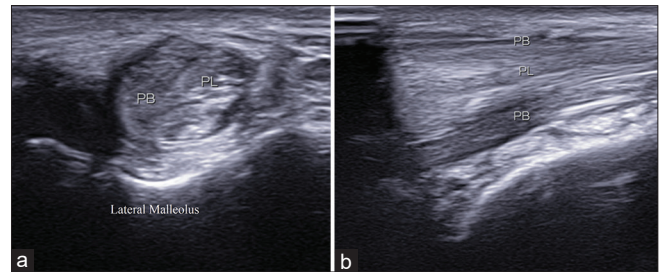


Figure 1: Short-axis (a) and long-axis (b) ultrasound images of the lateral retromalleolar region of the ankle is showing splitting of peroneus brevis tendon with the insinuation of peroneus longus tendon into the gap formed by the split peroneus brevis

in a retrospective study.^[3] Radiography and ultrasonography are often the first-line diagnostic modalities. Radiography is primarily to rule out fractures, while ultrasonography identifies tendon ruptures with a high degree of sensitivity and specificity. Dynamic ultrasonography, using active or passive mobilization or pressure application with the probe, provides additional diagnostic information.^[4]

The muscles of the lateral compartment of the leg are the PL, PB, and peroneus tertius. The most superficial and the longest is the PL, while the PB is present underneath. Close to the lateral malleolus, the PB tendon is anteromedial to the PL tendon. Both the tendons then pass posterior to the lateral malleolus beneath the peroneal retinaculum through the retromalleolar groove. The tendon of the PB inserts on the fifth metatarsal base, while the tendon of the PL turns medially, grooves the cuboid, and inserts onto the medial cuneiform and the first metatarsal bone.^[5]

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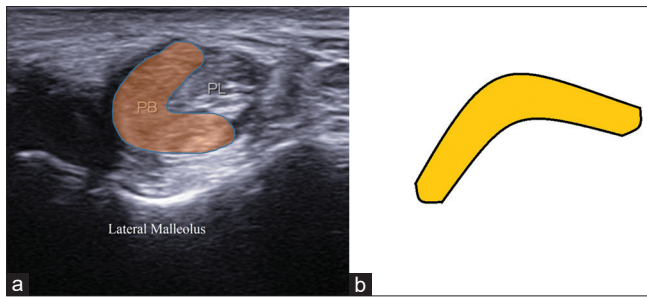


Figure 2: Short-axis ultrasound image (a) of the lateral retromalleolar region of the ankle is showing splitting of peroneus brevis tendon with the insinuation of peroneus longus tendon into the gap formed by the split peroneus brevis giving characteristic “boomerang sign”. Picture of a boomerang is shown for reference (b)

Ultrasound of the peroneal tendons can be done in the supine or sitting position with slight plantar flexion and medial rotation of the foot. Axial imaging is performed starting from the muscle bellies and then continuing to the tendons. The axial scan provides a good view of the tendons as well as the myotendinous junctions. The probe is then rotated to obtain a longitudinal view of the tendons. A dynamic scan is performed by asking the patient to do inversion of the ankle with slight plantar flexion, as some tears may not be seen in all positions.^[5]

A tear of the PB tendon is more common than the PL tendon due to its position between the PL tendon laterally and the retromalleolar groove medially. Tears of PB can be partial, longitudinal, or full thickness. In longitudinal tears of the PB, as seen in our case, the PB splits and surrounds the PL tendon, giving the classic “boomerang” appearance.^[6] Tears generally start in the deep part of the tendon leading to a fissure, which then progresses to a full-thickness longitudinal tear. If a tear is found, one should also look for associated tenosynovitis, a common association.^[7]

Tears of the PL tendon are less common and are caused by direct trauma or athletic injuries. These occur primarily in the cuboid tunnel, mostly in proximity to an os peroneum. Os peroneum is a common sesamoid bone within the PL tendon, seen in the cuboid tunnel in the lateral aspect. It may or may not be ossified.^[6,7]

First line of therapy is generally conservative and includes NSAIDs with rest, ice, compression, and physical therapy. Surgical options are generally considered only when conservative management fails.^[8] Our case highlights the importance of certain signs described in the radiology literature, which are based on the living and nonliving objects. Knowing these signs is important as it helps in remembering the pathology.^[9]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initial will not be published and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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Nil.

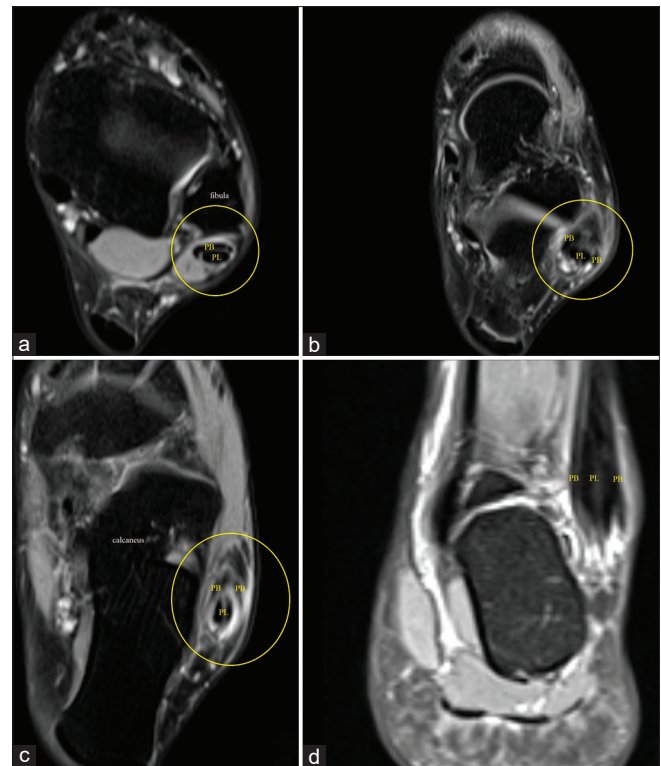


Figure 3: Magnetic resonance imaging of the ankle region in the axial sections (a-c) showing splitting of peroneus brevis tendon with the insinuation of peroneus longus tendon into the gap formed by the split peroneus brevis giving characteristic “boomerang sign.” The same abnormality was confirmed on the coronal plane (d)

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Chiu YH, Chang KV, Chen IJ, Wu WT, Özçakar L. Utility of sonoelastography for the evaluation of rotator cuff tendon and pertinent disorders: A systematic review and meta-analysis. *Eur Radiol* 2020;30:6663-72.
- Chang PH, Chen YJ, Chang KV, Wu WT, Özçakar L. Ultrasound measurements of superficial and deep masticatory muscles in various postures: Reliability and influencers. *Sci Rep* 2020;10:14357.
- O'Neil JT, Pedowitz DI, Kerbel YE, Coddling JL, Zoga AC, Raikin SM. Peroneal tendon abnormalities on routine magnetic resonance imaging of the foot and ankle. *Foot Ankle Int* 2016;37:743-7.
- Draghi F, Bortolotto C, Draghi AG, Gitto S. Intraseath instability of the peroneal tendons: Dynamic ultrasound imaging. *J Ultrasound Med* 2018;37:2753-8.
- Wang XT, Rosenberg ZS, Mechlin MB, Schweitzer ME. Normal variants and diseases of the peroneal tendons and superior peroneal retinaculum: MR imaging features. *Radiographics* 2005;25:587-602.
- Taljanovic MS, Alcala JN, Gimber LH, Rieke JD, Chilvers MM, Latt LD. High-resolution US and MR imaging of peroneal tendon injuries. *Radiographics* 2015;35:179-99.
- Lee SJ, Jacobson JA, Kim SM, Fessell D, Jiang Y, Dong Q, *et al.* Ultrasound and MRI of the peroneal tendons and associated pathology. *Skeletal Radiol* 2013;42:1191-200.
- Philbin TM, Landis GS, Smith B. Peroneal tendon injuries. *J Am Acad Orthop Surg* 2009;17:306-17.
- Indrajit IK. Signs in radiology. *Indian J Radiol Imaging* 2013 [cited 2021 Jan 29];23:397-8.