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Case Report

Idiopathic hallux saltans an unusual presentation of flexor hallucis longus tendinopathy: a case report

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Abstract

Hallux saltans is a rare condition characterized by an entrapment of the flexor hallucis longus. Its tendon passes through the retromalleolar groove below the flexor retinaculum, directing the plantar aspect of the foot through a fibro-osseous tunnel below the sustentaculum tali. This study presents a young active patient without any of the conditions or etiological agents previously described in the literature that could explain the cause of this rare condition. After failing conservative treatments, an arthroscopic release of the tendon and the fibrous tunnel was performed, achieving direct visualization and minimal soft tissue injury. At six month follow-up, the patient resumed sports and daily living activities without symptoms.

Level of Evidence V; Therapeutic Studies; Expert Opinion.

Keywords: Tendinopathy; Tendon entrapment; Trigger finger disorder; Arthroscopy; Case reports.

Introduction

Hallux saltans is a rare condition characterized by an entrapment of the flexor hallucis longus (FHL) tendon in its pathway through the intercolicular fibro-osseous tunnel of the talus. It is mainly caused by the tendon thickening before entering the distal part of its sheath, which could also be thickened and stenotic, increasing the tendon's nodular changes[1].

The FHL is a muscle of the posterior leg compartment that arises from the posterior part of the fibula and interosseous membrane. Its tendon passes through the retromalleolar groove below the flexor retinaculum, directing the plantar aspect of the foot through a fibro-osseous tunnel below the sustentaculum tali, ending up inserted at the base of the hallux distal phalanx. Its main function is flexion of the hallux metatarsophalangeal and interphalangeal joints[2].

This infrequent pathology has commonly been related to sports that require excessive plantar flexion, such as classical ballet dancers, soccer, downhill runners, and gymnasts, between the second and fourth decades of life[1,3]. The typically described locations for FHL entrapment are the retromalleolar FHL sheath (most frequent), within the fibro-osseous tunnel below the sustentaculum tali, at Henry's master knot, and behind the intersesamoid ligament[2].

Causes depend upon the site of entrapment. Although considered an idiopathic condition, some authors have implied a relationship between FHL entrapments to Os Trigonum, an osteochondral structure created by a secondary chondral ossification center at the level of the posterior margin of the talus and Stieda process[3]. Other less common causes may be space-occupying cystic formations, accessory flexor digitorum longus, calcaneal fractures, ankle arthrodesis, and tumors such as chondromas within the tendon sheath and lipochondromatosis[3,4].

Symptoms are similar to its analog in hand: a preserved flexion movement with a sudden release during extension caused by the thickened tendon (trigger effect). However, the degree of movement restriction could vary from a simple snapping to a joint blocked in flexion that needs a manual extension to release deformity, with variable associated retromalleolar pain[3].

Study performed at the Clínica Universidad de los Andes, Santiago, Chile.

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A patient was diagnosed with the symptoms above and confirmed by dynamic ultrasound reproducing the tendon snapping through a restricted tunnel or a magnetic resonance imaging showing tendon enlargement upon tunnel entrance[5].

Conservative treatments such as rest, ice, non-steroidal anti-inflammatory drugs (NSAIDs), physiotherapy, bracing, or local corticosteroid injections sustain satisfactory results in 46% to 64% of cases. However, surgical approaches are recommended when those treatments fail[6].

Case description

The study was approved by the Research Ethics Committee of the institution and the patient signed the informed consent form.

A 23-year-old male patient with no previous trauma had a two-year history of audible painless snaping of the great toe during active flexion and intermittent locking in a flexed position that needed passive correction.

The radiographs showed no bone deformities such as os trigonum or Stieda process. A musculoskeletal radiologist performed dynamic sonography with a high-frequency linear transducer. FHL tendon was thickened and hypoechoic, determining tendon entrapping with active and passive flexion at the fibro-osseous FHL tunnel at the posterior ankle chamber, along with narrowing of the tunnel itself. No images of fibrillar ruptures were found. The magnetic resonance imaging revealed significant fusiform thickening of the FHL tendon, at the level of the posterior margin of the talus, with a slight thickening of the synovial sheath, without evidence of dislocation or rupture and increased amount of fluid with inflammatory alteration of the proximal synovial sheath (Figure 1).

Conservative treatments were performed with an orthopedic boot, physiotherapy, NSAIDs, sports rest for 21 days, and ultrasound-guided corticosteroid infiltration. At three month follow-up, the patient returned to consult with the symptoms still present, and surgical treatment was indicated.

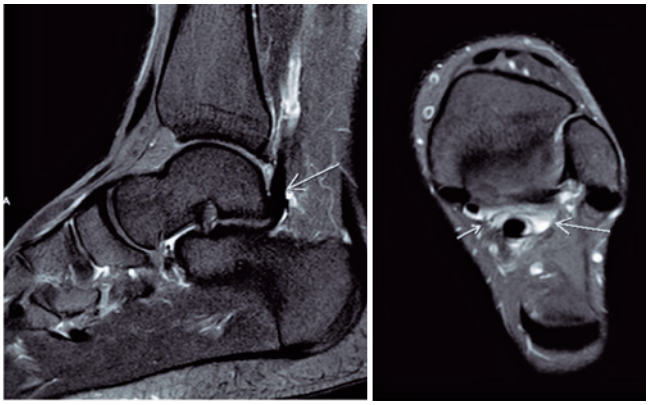

Figure 1. Sagital and axial section of the ankle in T2 showing fusiform thickening of the FHL tendon, at the level of the posterior margin of the talus and tenosynovial inflammatory infiltrate of the medial retromalleolar FHL tendon.

The patient was in a prone position, under regional anesthesia and using a tourniquet hemostatic. A posterior arthroscopic with a 3.0 mm 30° arthroscope and 3.5 shavers was performed by an experienced orthopedic surgeon in a district general clinic.A peritendinous sheath release was performed, partial resection of the fibro-osseous tunnel, and tendon thinning by resecting the excessive scar tissue (Figure 2). No accessory muscles, low muscle belly, or tendon rupture were identified. Due to muscle relaxation, the snapping could not be reproduced during surgery. Despite this, a careful release to avoid stenosis of the tendon in the tunnel was performed. After tenosynovectomy and release, the ankle and FHL were mobilized, directly visualizing its free movement through the tunnel.

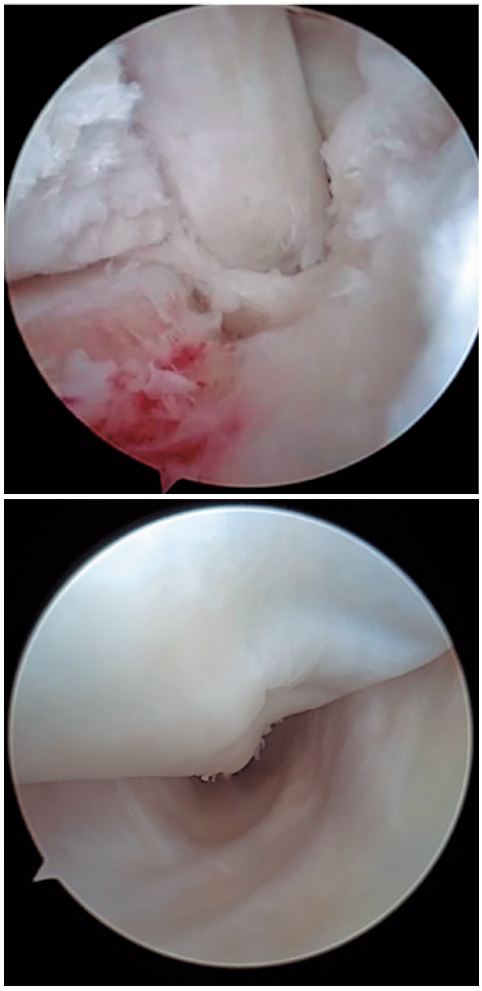

Figure 2. Posterior arthroscopic visualization, showing thickened FHL tendon with extensive tenosynovitis and narrowing of the fibroosseous tunnel.

The patient was allowed to partial weight-bearing according to tolerance assisted by two crunches for one week. Antibiotic was indicated, venous thromboembolism prophylaxis was prescribed, and there were no complications or adverse outcomes.

At six-month follow-up and after ten physiotherapy sessions, the patient presented no tenderness along the FHL or any snapping sensation during mobilization of his ankle and hallux.

Discussion

FHL tenosynovitis is a rare condition, more prevalent among a special subset of patients like ballet dancers or athletes who perform repetitive plantarflexion movements[3]. They usually respond to conservative treatments such as NSAIDs, corticosteroid infiltration, and physiotherapy[5]. In some patients, a more complex problem arises when FHL tenosynovitis is associated with a significant fibro-osseous tunnel or tendon thickening, resulting in tendon entrapment before entering the tunnel in the back of the talus, limiting its free movement and generating a palpable and sometimes audible snapping, which is the clinical manifestation of hallux saltans.

After failing conservative treatments, surgical treatment is warranted for symptomatic patients. The literature has shown an 80 to 90% success rate after either open or arthroscopic FHL release[7]. Open treatment is a reasonable option, Purushothaman et al.[8] released through an open incision over the posteromedial aspect of the ankle the FHL entrapment in a non-previously reported location, proximal to the medial malleolus in an unskilled manual laborer. They found a thickening of the fascial sheath overlying the FHL tendon and performed a complete release of this thickened sheath. Unlike our approach, this group performed surgery with the patient under local anesthesia, asking the patient to demonstrate triggering and confirm the relief. Despite the good results of open approaches, we prefer arthroscopically for better visualization and less soft tissue damage.

Chinzei et al.[1] reported a case of stenosing tenosynovitis, and the treatment consisted of arthroscopically releasing the FHL. When performing the posterior arthroscopy, a partial degenerative FHL lesion was identified, and the proximal scar at zone 1 was thickened by forming a fibrous band near the fibro-osseous tunnel below the sustentaculum tali.

Komiya and Terada[9] reported the case of FHL entrapment in the osseo fibrous tunnel below the sustentaculum tali after a calcaneal fracture with an osseous fragment, corrected after releasing the fibro-osseous tunnel and resecting the bone fragment that limited free tendon motion.

When conservative treatments fail, arthroscopic release becomes a useful tool with little morbidity and favorable functional results in the short and medium term. However, when tendon damage is present, resecting up to 50% of the tendon is considered if necessary, compromising the concept applied to peroneal tendons where resection of up to 66% of a tendon with tenosynovitis could be performed[10].

The limitation of this case report was the type of anesthesia chosen. Regional instead of local anesthesia would be preferred to ask for the patient to reproduce the snapping sound while debriding the tendon and fibro-osseous tunnel resection.

Conclusion

Hallux saltans is a rare condition, mostly idiopathic in its origin. After failing conservative treatments, surgical treatment is an option. It consists of resecting FHL enlargement to its original width and freeing the fibro-osseous tunnel in the back of the talus to solve the space conflict during its normal gliding. An arthroscopic approach is optimal as it allows a good visualization without harming soft tissues and faster recovery.

Author's contributions: Each author contributed individually and significantly to the development of this article: FMZ *(https://orcid.org/0000-0002-6520-9775) Conceived and planned the activities that led to the study, interpreted the results of the study, participated in the review process, data collection, statistical analysis, approved the final version; ARC *(https://orcid.org/0000-0002-3442-8342) Interpreted the results of the study, participated in the review process and approved the final version; MPP *(https://orcid.org/0000-0002-2820-5337) Conceived and planned the activities that led to the study, statistical analysis, bibliographic review, survey of the medical records, wrote the article, participated in the review process, formatting of the article, approved the final version; COM *(https://orcid.org/0000-0003-2574-9010) Conceived and planned the activities that led to the study, interpreted the results of the study, participated in the reviewing process, approved the final version; GCU *(https://orcid.org/0000-0002-1993-6250) Wrote the article, performed the surgery, participated in the reviewing process, approved the final version; FCR (https://orcid.org/0000-0002-3524-0624) Conceived and planned the activities that led to the study, interpreted the results of the study, performed the surgery, data collection, interpreted the results of the study, approved the final version. All authors read and approved the final manuscript. *ORCID (Open Researcher and Contributor ID).

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