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Case Report

Achilles tendon detachment after local infiltration of corticosteroids: a case report

Jorge Javier Del Vecchio[1,2,3], Eric Daniel Dealbera[1], Jorge Pablo Batista[4,5], Mauricio Esteban Ghioldi[1], Lucas Nicolás Chemes[1]

1. Hospital Universitario, Fundación Favaloro, Ciudad Autónoma de Buenos Aires, Argentina.
2. Universidad Favaloro, Ciudad Autónoma de Buenos Aires, Argentina.
3. GRECMIP MIFAS (Groupe de Recherche et d'Etude en Chirurgie Mini-Invasive du Pied-Minimally Invasive Foot and Ankle Society), Merignac, France.
4. Consultorios de Artroscopia Jorge Batista, Ciudad Autónoma de Buenos Aires, Argentina.
5. Club Atletico Boca Juniors, Professional Soccer, Ciudad Autónoma de Buenos Aires, Argentina.

Abstract

Complete disinsertion of the Achilles tendon is relatively rare but is an injury of considerable clinical significance. A 50-year-old non-smoking man presented with complete disinsertion of the Achilles tendon due to an indirect low-energy trauma shortly after administration of local corticosteroid injections (LCI) for treatment of deep retrocalcaneal bursitis. Imaging studies showed complete disinsertion of the Achilles tendon as well as severe Haglund syndrome and retrocalcaneal bursitis. The tendon was repaired, and the Haglund deformity and retrocalcaneal bursa were then resected. Although Achilles tendon rupture is a frequent complication after LCI, to date, no cases of disinsertion have been published. Surgeons must be aware of this issue, especially in patients with previous insertional calcific Achilles tendinosis and Haglund syndrome.

Level of Evidence V; Therapeutic Studies; Expert Opinion.

Keywords: Achilles tendon/injuries; Rupture; Injections, intralesional; Bursitis/surgery; Calcaneus.

Introduction

Complete disinsertion of the Achilles tendon is relatively rare but is an injury of considerable clinical significance. A common cause of non-traumatic, non-insertional tendon rupture is local corticosteroid infiltration (LCI)[1]. LCI may start a degenerative process resulting in partial and, subsequently, complete rupture of the tendon due to a direct toxic effect. This is produced by inhibition of the production of extracellular matrix collagen and poor local vascularization[2].

This case report describes a patient who presented with the rare complication of complete disinsertion of the Achilles tendon shortly after administration of LCI during treatment of retrocalcaneal bursitis (RB). Although Achilles tendon rupture is a frequent complication after LCI, no cases of disinsertion have been published to date. Surgeons must be aware of this issue, especially in patients with previous insertional calcific Achilles tendinosis (ICAT)[3] and Haglund syndrome.

Case report

This report was approved by our institutional Human Research Ethics Committee, and the patient provided written informed consent for publication.

A 50-year-old healthy, non-smoking male presented following indirect low-energy trauma (forced dorsiflexion) to the Achilles region caused by a bicycle accident. The patient was overweight (BMI 30.47m^2; height 1.90m, weight 110kg) and engaged in occasional recreational physical activity. No history of quinolone intake was found in his medical record. He had a history of two infiltrations with corticosteroids (6 and 11 months before the beginning of symptoms) for retrocalcaneal bursitis with satisfactory initial results. The patient also presented clinical and radiological signs of ICAT[3], showing no pain at the Haglund deformity or the posterior calcification.

Study performed at the Fundacion Favaloro and Hospital Universitario, Ciudad Autonoma de Buenos Aires, Argentina.

Correspondence: Jorge Javier Del Vecchio. 495 Entre Ríos Av., Ciudad Autónoma de Buenos Aires, Argentina, **Zip Code:** 1079. **E-mail:** javierdv@mac.com. **Conflicts of interest:** none. **Source of funding:** none. **Date received:** January 23, 2021. **Date accepted:** March 09, 2021. **Online:** April 30, 2021.

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Upon arrival in the emergency room, the patient was initially immobilized with a walking boot in a neutral position. Physical examination showed mild ecchymosis at the calcaneus associated with a palpable gap of approximately 30mm. The Thompson and heel-rise tests were positive. X-rays and an MRI showed complete disinsertion of the Achilles tendon, as well as severe Haglund syndrome and retrocalcaneal bursitis.

Surgical repair was done under general anesthesia. The surgical technique consisted of a posterior midline approach 8cm long with protection of the sural nerve. The tendon was repaired with the Arthrex Achilles SpeedBridge™ Implant System (Arthrex Inc, Florida, United States). Complete detachment of its calcaneus insertion was observed (Figure 1). The Haglund deformity and retrocalcaneal bursa were then resected (Figure 2). The SpeedBridge System was placed in an hourglass shape as described in the original procedure (Figure 3), and the wound was sutured closed.

Postoperatively, the patient was immobilized with a plaster boot in an equinus position at 20 degrees for 2 weeks until wound closure and removal of sutures. He was then allowed to weight-bear with a walker boot for another 2 weeks in 10 degrees of equinus and, finally, for another 2 weeks in a neutral position.

The patient was evaluated with the American Orthopedic Foot and Ankle Society Score (AOFAS), a visual analog scale (VAS) of pain, and the Foot and Ankle Ability Measures (FAAM) subscale for activities of daily living (ADL) and sports at final follow-up (12 months). Clinical and functional evaluation was also performed with the Achilles Tendon total Rupture Score (ATRS), and the total length of the surgically operated Achilles tendon was compared with the contralateral tendon.

At 12-month follow-up, the results were as follows: AOFAS, 85 points; VAS, 2; FAAM ADL, 55; FAAM Sports, 72.3. Although the ATRS score was designed for complete rupture rather than disinsertion of the Achilles tendon, we implemented it in this case and obtained a score of 85 at 12 months postoperatively. MRI measurement showed a length of 205mm in the healthy tendon and 200mm in the operated tendon with a negative formula. We assume that this outcome is due to the distal resection needed for reinsertion, not to a preexisting anatomical variant or congenital shortening.

Discussion

Complete disinsertion of the Achilles tendon without a traumatic mechanism of injury is rare[1].

Most corticosteroids currently used in orthopedic practice are synthetic analogs of endogenous human hormones. They are widely used for their anti-inflammatory and analgesic activity, but must be used judiciously. Adverse effects include osteopenia and immunosuppression, post-injection dermatitis, facial erythema, tendon and ligament rupture, pigmentation changes, and fatty atrophy, which can be severe in some cases. Animal studies report that tendon infiltration with corticosteroids causes changes in microvascularization, areas of collagen necrosis, and decreased tensile strength, ultimately leading to tendon rupture[2].

LCI has proven to be a safe and effective option for treating a variety of foot and ankle conditions, and reduces the need for surgery (only 12% for RB)[4]. Infiltration of the Achilles tendon is rarely performed nowadays, as they are associated with non-insertional injuries. However, in cases of retrocalcaneal bursitis, it is still considered a valid treatment and is widely performed[5]. In 2011, Johnson et al. published a study on complications from corticosteroid injection in foot and ankle pathologies. They included the experience of 969 surgeons and more than 50% infiltrations of retrocalcaneal bursitis, reporting no cases of rupture or detachment of the Achilles tendon.

Some authors report that an accurate ultrasound (US)-guided LCI of the retrocalcaneal bursa guarantees an effective and safe technique and prevents secondary complications[6,7]. In the case we presented, we believe that an

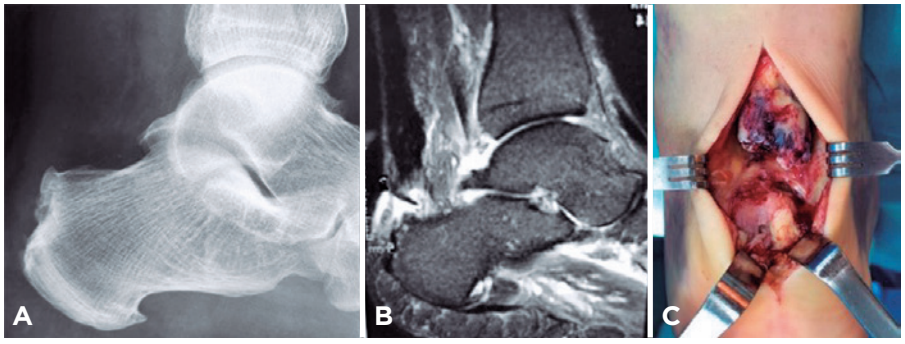

Figure 1. (A) X-ray showing Haglund exostosis and irregularity in the insertion area. (B) T2-weighted MRI, sagittal view, showing complete detachment of Achilles insertion. (C) Clinical view.

incorrect LCI technique (LCI outside the retrocalcaneal bursa) was the cause of the injury. Although LCI is still a valid treatment for retrocalcaneal bursitis, in our opinion and based on published studies, this must be performed under US guidance. Haglund syndrome can be treated by LCI without the use of ultrasound, but our patient did not have a trigger point over his Haglund deformity.

Recently, some authors found connections between the retrocalcaneal bursa and the anterior fibers of the Achilles tendon, which should be considered a weak zone when performing infiltrations[8,9]. Although LCI may help to relieve symptoms of RB, it may also increase the risk of Achilles tendon rupture. According to Turmo-Garuz et al., this risk-benefit ratio has to be considered when LCI is to be performed on professional and high-level athletes. These authors found gastrocnemius and soleus muscle lesions in three patients[9]. We think that our patient had been injected in the retrocalcaneal space but outside the bursa, and this may have weakened the Achilles insertion.

The SpeedBridge technique allows the use of an "hourglass suture procedure" beyond the distal end of the tendon, without knots and with a greater compression area for the Achilles tendon in the calcaneus. According to some authors, this procedure improves insertional strength and can allow early return to sports activities[10]. In a recent study by Rigby et al.[10], 42 of 43 patients operated with the SpeedBridge technique recovered 100% of their activities of daily living and physical capacity.

Conclusion

To date, there are no published cases of complete disinsertion of the Achilles tendon as a complication of LCI. Corticosteroid treatment must be administered correctly and accurately. We recommend the use of ultrasound guidance for LCI to allow correct localization of the retrocalcaneal bursa, which is essential to achieving good results and safe infiltration, avoiding damage to the Achilles tendon. Finally, surgeons must be aware that LCI may lead to Achilles tendon rupture (even if correctly done under US guidance) and even tendon disinsertion (if infiltrated incorrectly outside the bursa).

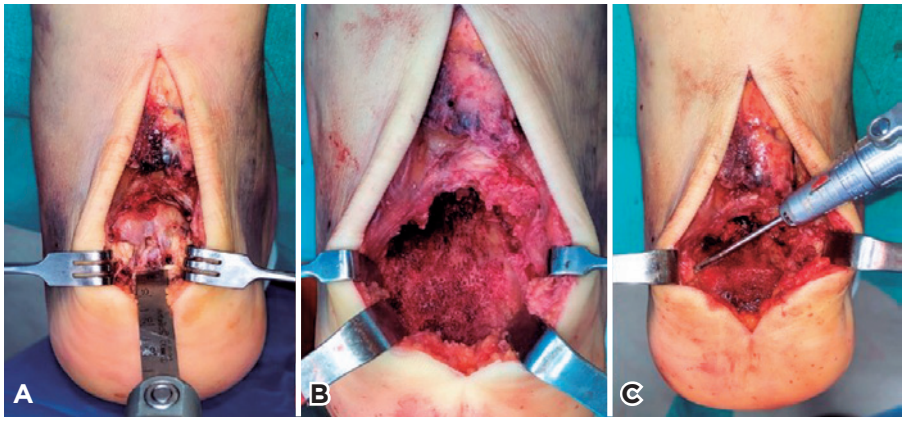

Figure 2. (A) Resection on Haglund's deformity with sagittal saw. (B) Complete resection. (C) Remodeling of calcaneus posterior tuberosity with 3.1 wedge burr.

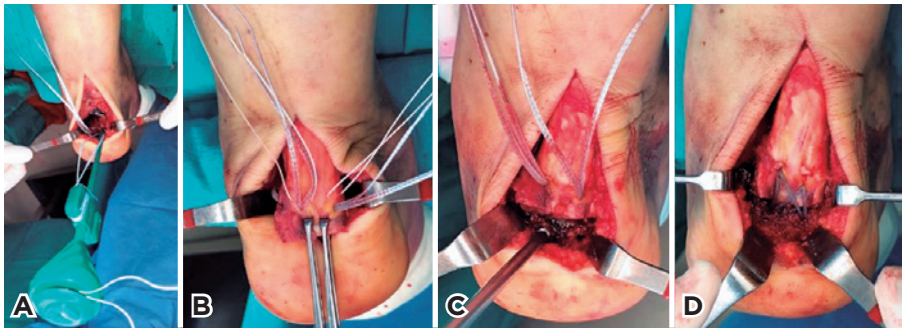

Figure 3. (A) Insertion of first 4.75 SwiveLock® anchor for the SpeedBridge™ System technique. (©Arthrex, Inc.) (B-D). Threading of Achilles tendon until final reinsertion.

Authors' contributions: Each author contributed individually and significantly to the development of this article: JJDV *(https://orcid.org/0000-0001-5263-7626) conceived and planned the activities that led to the study, performed the surgery; EDD *(https://orcid.org/0000-0001-5684-3902) data collection, bibliographic review; JPB *(: https://orcid.org/0000-0003-0910-4140) interpreted the results of the study; MEG *(https://orcid.org/0000-0002-5953-9380) interpreted the results of the study, participated in the review process; LNC *(https://orcid.org/0000-0003-4981-6169) clinical examination, survey of the medical records, bibliographic review. All authors read and approved the final manuscript. *ORCID (Open Researcher and Contributor ID).

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