

Bilateral Achilles Tendon Rupture Following Local Corticosteroid Infiltration: A Report of Rare Case

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Abstract

Background: The Achilles tendon is the largest tendon in the body. Local infiltration is recognized to be cost-saving and effective in treating musculoskeletal pain. However, using corticosteroids in the long term can lead to adverse consequences such as osteoporosis, immunosuppressive effect, or tendon rupture.

Case presentation: In this paper, we reported a case with bilateral Achilles tendon rupture following corticosteroid treatment. When Achilles tendon rupture occurs, surgical treatment is necessary to rehabilitate Achilles tendon function and avoid severe complications.

Conclusion: This report reviewed a case of bilateral Achilles tendon rupture following corticosteroid treatment precautions which should be considered.

Keywords: Achilles Tendon Rupture; Pathological Achilles Tendon Rupture; Bilateral Heel Tendon Rupture.

Introduction

The Achilles tendon is the largest in the body. In addition to participating in movements such as walking, jumping, and running, the Achilles tendon helps the body to stand on the tips of the toes. Since the Achilles tendon is used in most activities, it is also a place of great stress and vulnerability. The Achilles tendon is a poorly vascularized area about 3-6 cm from its attachment to the calcaneus. The Achilles tendon is often affected by inflammation at the point of tendon attachment, peritendonitis, fasciitis, tendon rupture, or tendon rupture ¹. Local infiltration is recognized to be cost-saving and effective in treating musculoskeletal pain ². However, using corticosteroids in the long term can lead to different adverse consequences such as osteoporosis, immunosuppressive effect, or tendon rupture ²⁻⁶. This paper reported a bilateral Achilles tendon rupture case to reaffirm that corticosteroid treatment could contribute to a significant injury.

Case presentation

A 52-year-old female patient was overweight, and her face showed signs of Cushing's syndrome. The patient had had bilateral Achilles tendon pain for a long time. Corticosteroid injections are treated in a local private clinic. After each injection, the patient felt less pain, was more comfortable and was easy to walk, but the improvements lasted only a few months, and the time for recurrences narrowed. About one month after the latest injection, on one occasion, when the patient changed her position suddenly from sitting to standing, the patient experienced sharp pain in the bilateral Achilles tendon and then functional impotence for no apparent reason. After that, the patient could not walk by herself and had to have the support of two family members to rest in bed. After a few hours of rest, there was no improvement; the patient still had pain in two heels and could not walk as usual.

Her husband and son brought the patient to the Department of Trauma and Orthopedics, Thai Binh

University of Medicine and Pharmacy Hospital. Through examination, there were signs of bruising on both heels, severe swelling, painful in palpation on both sides of the heel. The result of the Thompson test was positive on both sides. There was a palpable space in the Achilles tendon on both sides. No skin necrosis was observed in the heel tendon areas. The patient could not stand on two toes but could be dorsiflexed 20 degrees on both feet (equivalent to an average person), but only plantarflexed about 5-10 degrees on each side (compared to about 45 degrees in healthy people) with effort. The patient could perform a bilateral 30-degree

internal incline and an external 20-degree tilt without difficulty. Sensory and motor areas, innervated by the tibial and peroneal nerves, were normal. The anterior and posterior tibial vascular conditions were clear. The patient did not play any sports and had no history of trauma. **Figure 1** shows the heels and Achilles tendon conditions. After clinical examination, we gave the patient a bilateral calcaneal X-ray, showing the state of calcaneal spurs on both sides (**Figure 2**).

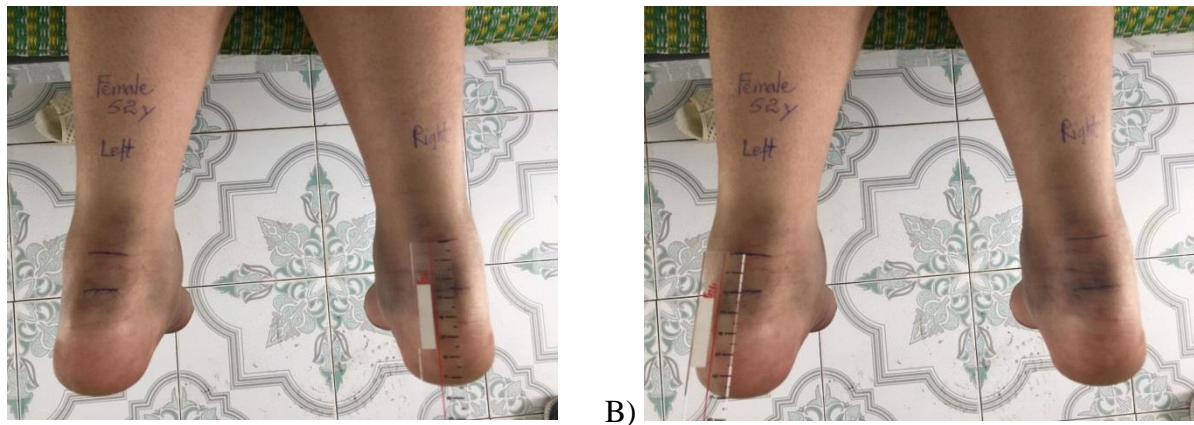


Figure 1: Heels and Achilles tendon : A) Right heel bruise, "space" of the Achilles tendon was about 2.5cm; B) Left heel bruise, "space" of the Achilles tendon of about 2cm.



Figure 2: X-rays showed discontinuity of the Achilles tendon strips on both sides, near calcaneal tubercles and obliteration of pre-Achilles fat pad (Kager's triangle).

We gave the patient a soft tissue ultrasound of the 2-sided Achilles tendon areas. We found that there were enlargements of those tendons (1.5cm) with hypochoic areas, which changed in size with passive dorsiflexion and plantarflexion of ankles. That meant a rupture of the Achilles tendon and a hematoma between the ends of both legs. To confirm the diagnosis, we gave

the patient to perform magnetic resonance imaging of 2 ankles, then concluded that there were partial tears of both Achilles' tendons (**Figure 3**).



Figure 3: Magnetic Resonance Imaging of ankles with A) T1 and T2 in the right leg; B) T1 and T2 in the left leg.

Figure 3 shows the magnetic resonance imaging results of both legs. T1 led that distal ends of the Achilles tendons on both sides were markedly thickened and not loose along the path of those tendons. T2 of each leg showed a rupture of the Achilles tendon near the tendon attachment about 1cm. A space in the tendon was visible.

To differentiate and rule out deep vein thrombosis (DVT), a condition with many similarities that could be ignored and had devastating consequences, we gave the patient a Doppler ultrasound of both legs and identified no bipedal vascular abnormalities. After excluding possible causes, we confirmed diagnosed that patients experienced bilateral Achilles tendon rupture due to local corticosteroid infiltration. We decided to perform surgery to repair the Achilles tendon on two sides.

Surgical procedures

The incision at the medial aspect of the left Achilles tendon enabled us to approach the tendon directly. After exposing it, we noticed that most of the left Achilles

tendon was torn, close to the calcaneal tubercle, and only a few thin fibers were intact. We cut and filtered to save tendons and clean up the attachment points. We drilled two tunnels through the convexity of the left tuberosity. We sutured the left Achilles tendon with prolene thread, applying a modified Kessler repair technique and fixing the drilled tunnel. We then sutured to reinforce the tendon sheath with a prolene thread according to the Tajima technique. We performed a similar procedure for the right Achilles tendon. After restoring other anatomical components by suturing, two patients' legs were placed in a short leg cast with windows in maximal plantar flexion. (**Figure 4, 5**).

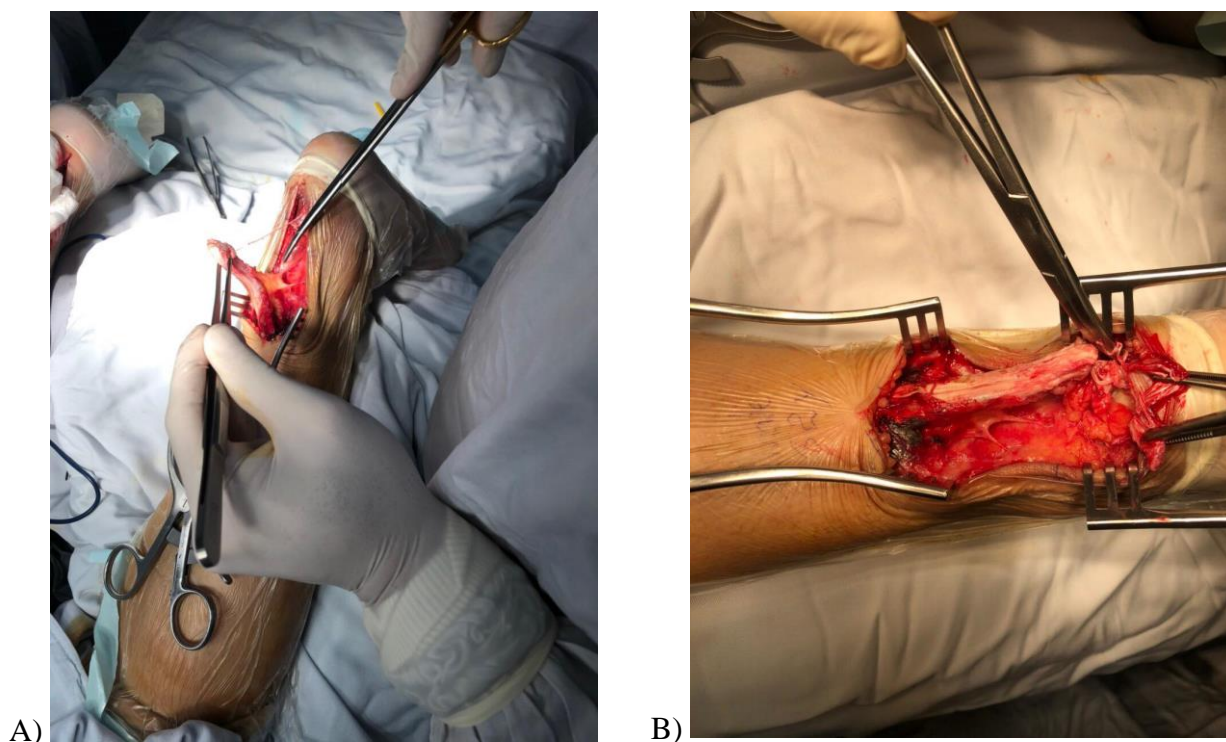


Figure 4: Left Achilles tendon rupture at the attachment point.

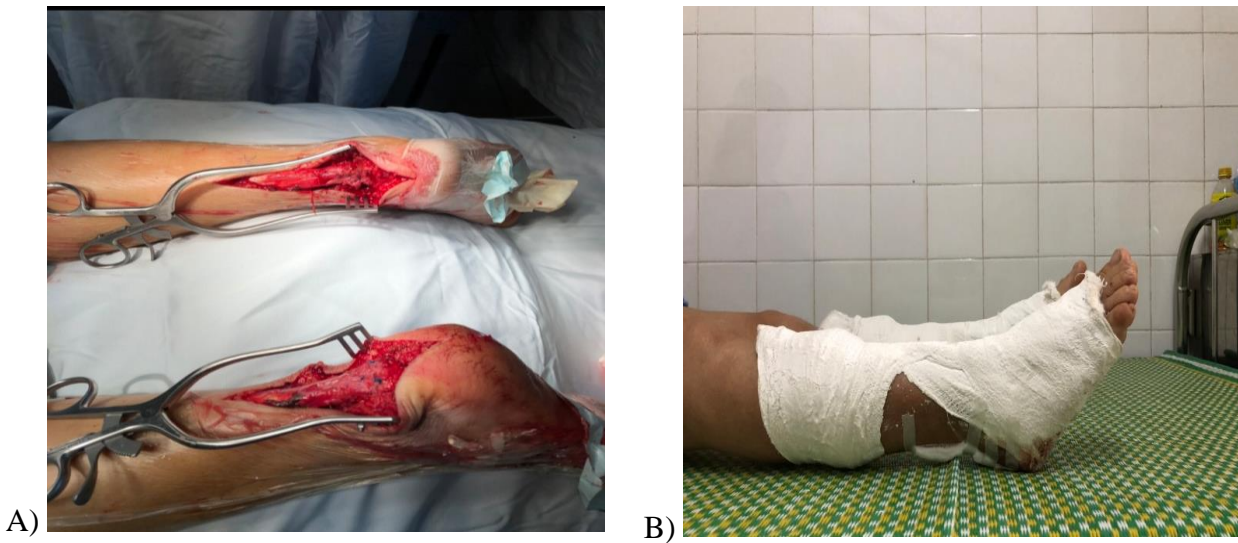


Figure 5: Tendon repair in surgery and postoperative short leg casts with windows.

In recovery after surgery, the incision skin on both sides had signs of malnutrition and necrosis. After four weeks of care and debridement, due to poor local vascularization of this area, there was an ulcer on the left heel, which advanced to the skin defect, size 5x3cm, and the Achilles tendon was exposed. Right legs also had a skin defect 8x4cm with no Achilles tendon coverage (**Figure 6**).



Figure 6: Ulcer on left leg.

After consulting with colleagues and experts in skin flaps and vessels, the decision was made to continue to care for the left leg with a VAC machine; the right leg would be reconstructed with a reverse sural flap. After three months (after seven months since the first surgery), the left heel had scars that covered all Achilles tendons, and the sural flap on the right heel was well-developed right with a small scar. Bilateral foot motor function was restored; left foot: dorsiflexion - 20 degrees, plantar flexion - 40 degrees, eversion - 20 degrees, inversion - 35 degrees; right foot: dorsiflexion - 20 degrees, plantar flexion - 40 degrees, eversion - 20 degrees, inversion - 35 degrees (**Figure 7-9**).



Figure 7: 7 months postoperatively.

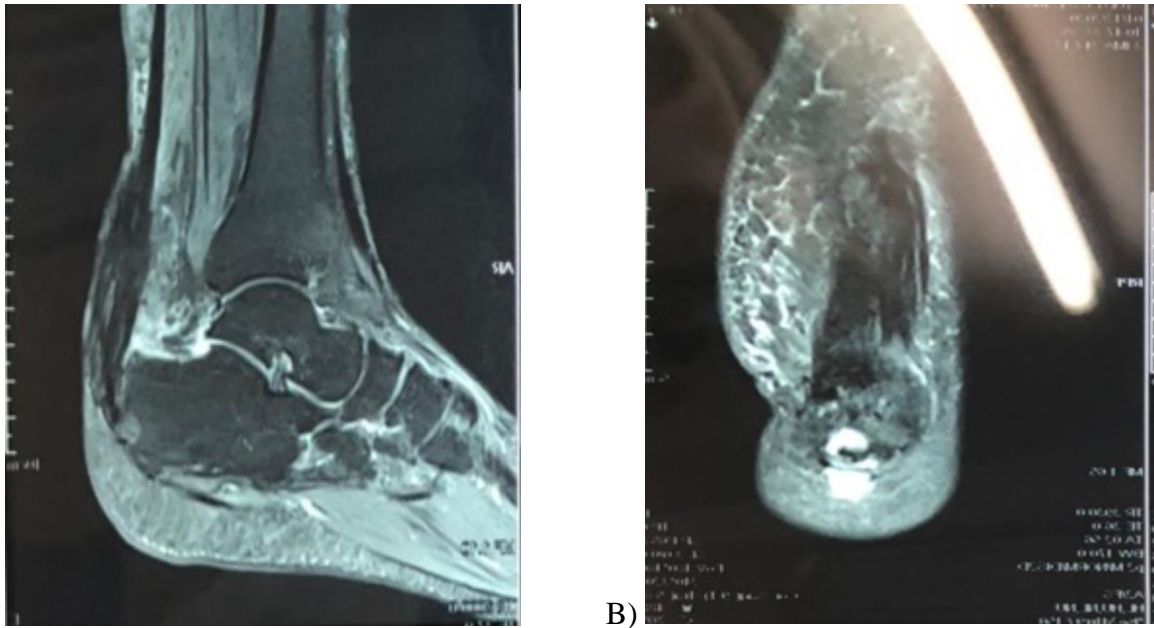


Figure 8: MRI of the left foot after VAC therapy.

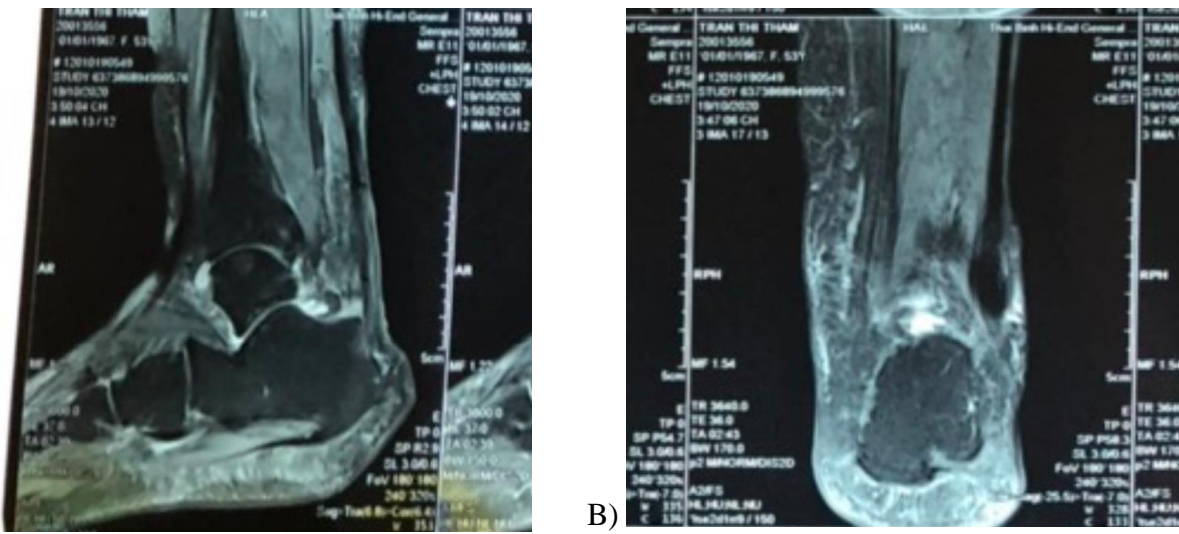


Figure 9: MRI of the right leg after flap reconstruction.

Discussion

Achilles tendon rupture is a relatively rare condition caused by traumatic or non-traumatic 1. Non-traumatic rupture is often associated with the degenerative process, resulting in a decrease in the strength, elasticity, and durability of tendon tissue over time, most commonly with local or systemic medication. Non-traumatic bilateral Achilles tendon rupture, as in

our case, is an extremely rare lesion. The world literature has recorded a few patients with a history of using Fluoroquinolone antibiotics ⁴ (mainly Levofloxacin ^{2,3,5}, a few used Ciprofloxacin ^{6,7}) or using systemic or local corticosteroids ⁸⁻¹¹.

The tendon rupture mechanism lies in the tendons' fibrosis caused by the local injection and systemic administration (in the above patient, corticosteroids), which leads to hypoxia. In addition, non-traumatic

lesions are typically localized in the critical area (about 3 cm proximal to the calcaneal insertion), which receives less blood flow. When progressing, the degenerative process may initially result in partial rupture and, subsequently, incomplete tendon rupture⁸. Our patients, with local corticosteroid injections for the treatment of Achilles tendonitis, as well as taking corticosteroids for a long time leading to non-traumatic bilateral Achilles tendons rupture, is a case in point⁶.

Also, because of the local fibrosis associated with the poor vascularization in this area, after the favorableness in suturing those tendons in operation, the postoperative treatment became very complicated due to the risk of skin necrosis along with the delayed healing from the tendon tissue itself, so the transfer of patients to the rehabilitation process was prolonged⁶.

And the most undesirable incident happened, skin necrosis around two incisions making Achilles tendons exposed.

However, with the valuable contributions of experts, colleagues, and our therapeutic efforts, the coverages took place smoothly, and the patient restored the function of the two ankles relatively well.

In our case, the ruptures did not occur at the typical site. But just above the insertion of those tendons to calcanei. This is where corticosteroid injection is often administered without ultrasound guidance. Subsequently, the ruptures happened about one month after the last injection. This fact and the atypical location of the lesion led to the suspicion that iatrogenic injury may have contributed to the rupture.

We have some notes during the treatment process. First, taking medical history in detail, meticulous physical examination, and routine radiography of calcaneus are crucial to finding risk factors of tendon rupture. Achilles tendon ultrasound with active and passive ankle flexion and extension is to identify the location of the rupture, lower limb Doppler ultrasound to eliminate deep vein thrombosis¹², and bilateral ankle MRI for definitive diagnosis. Second, treating a patient with bilateral non-traumatic Achilles tendon rupture is a repair procedure and cast immobilization to give the tendon time to recover. Third, the site of such rupture is mostly 3 cm above its insertion to the calcaneal tubercle¹². Our patient had a unique feature: those ruptures were right at the insertions, so we could not repair the tendon by conventional methods but by fixing it to the tunnels at

the tuberosities, which were created beforehand. Finally, when wound necrosis occurs, it is necessary to quickly decide to use the flap reconstruction to avoid prolonged treatment and quick rehabilitation.

Conclusion

This case report reviews a case with bilateral Achilles tendon rupture to reaffirm that corticosteroid treatment should be cautious for utilization. When Achilles tendon rupture occurs, surgical treatment is necessary to rehabilitate Achilles tendon function and avoid severe complications later. However, ischaemic skin necrosis at the heel areas and delayed healing of the tendons are widespread; tendon coverage with flap reconstruction should be considered at an early stage.

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Disclosure statement

The authors declare that there were no financial interests that relate to the research described in this paper.

Authors' contributions

Vu Minh Hai: Correspondence, Conceptualization

Duong Nhu Nam: Validation

Phan Thanh Nam: Writing

Vu Minh Hai: Data Gathering

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Ethical Statement

The authors took informed paper consent from the patient to present the case without identity determination.

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