

Acute spontaneous bilateral rupture of the Achilles tendon: a case report

Ruptura aguda espontânea do tendão de Aquiles bilateral: relato de caso

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ABSTRACT

This is a case report of a 67-year-old active, healthy, male patient who played sports. He presented with pain and bilateral ecchymosis in the calf area. Data from the patient's history, a physical examination and complementary exams confirmed a diagnosis of atraumatic spontaneous bilateral Achilles tendon rupture. Surgical treatment was performed using the percutaneous technique (the Achillon device) bilaterally. In the postoperative period, the patient used a walking boot with a 3-cm heel lift in maximum equinus for 45 days and in a neutral position until 60 days after the procedure. The patient began rehabilitation with physical therapy and returned to his sporting activities without restrictions.

Level of Evidence V; Prognostic Studies; Expert Opinion.

Keywords: Achilles tendon; Achilles tendon/surgery; Rupture, spontaneous; Treatment outcome.

RESUMO

Relato de caso de um paciente com 67 anos, homem, ativo, hígido, esportista. Apresentou dor e equimose em região de panturrilha bilateral. Dados da anamnese, exame físico e exames complementares confirmam diagnóstico de ruptura de tendão de Aquiles bilateral espontâneo atraumático. Realizado tratamento cirúrgico pela técnica percutânea (*tutor Achillon*), bilateralmente. No pós-operatório usou bota imobilizadora com salto de 3 cm em equino máximo por quarenta e cinco dias e em neutro até completar sessenta dias. O paciente iniciou a reabilitação com fisioterapia, e retornou as suas atividades esportivas sem restrições.

Nível de Evidência V; Estudos Prognósticos; Opinião de Especialista.

Descritores: Tendão do calcâneo; Tendão do calcâneo/cirurgia; Ruptura espontânea; Resultado do tratamento.

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INTRODUCTION

The Achilles tendon (AT) is the most frequently ruptured tendon in the lower limbs⁽¹⁾. AT rupture is more prevalent unilaterally in active men between the third and fifth decades of life as a result of a high-energy trauma that

generates an excessive load on the ankle. The incidence of spontaneous AT rupture is 0.02% in the general population, and it occurs bilaterally in less than 1% of this population⁽²⁾.

Bilateral AT rupture is rare in the absence of extrinsic and intrinsic risk factors⁽³⁾. Spontaneous ruptures are associated

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with patients who use medications such as fluoroquinolones and corticosteroids and those with comorbidities such as diabetes, renal failure and chronic tendonitis^(1,4).

Treatment may be conservative or surgical. Each patient's morbidity, functional status and complications should be analysed to determine the best option for each individual⁽⁵⁾. Adequate post-operative rehabilitation tends to minimize complications in the late postoperative period⁽⁶⁾. The objective of this study is to report a rare case of atraumatic spontaneous bilateral Achilles tendon rupture in a 67-year-old active patient with a comorbidity who underwent surgical treatment.

CASE REPORT

This study was approved by the Ethics Committee with registration in the Brazil Platform under CAEE number: 87944618.8.0000.5225.

The patient, FLM, a 67-year-old male with no history of trauma, experienced bilateral acute stabbing pains in the calf area in August and September of 2017. He presented with pain symptoms in the region of the Achilles tendon on the right, which was combined with the appearance of purplish spots and lameness. After approximately fifteen days, the patient developed the same symptoms on the left side. The time elapsed between the symptoms and the diagnosis was approximately 30 days. The patient had previously sought orthopaedic care, but was without a diagnosis until the time of the consultation. He had also undergone X-ray examinations, which showed no alterations, and nuclear magnetic resonance imaging, which indicated an injury suggestive of rupture of the Achilles tendons.

In terms of risk factors, the patient was active and played sports. He was previously healthy, did not use daily medications and was not receiving treatment for any comorbidities. There was also no report of the use of medications such as anti-inflammatories, corticoids or antibiotics. After the performance of the pre-anaesthetic evaluation, abnormalities were observed in the patient's glucose results; he was diagnosed with diabetes mellitus, and treatment with metformin, an oral hypoglycaemic agent, was started.

On physical examination, the patient had a bilateral gap of approximately 2cm in the Achilles tendon region at 3cm from the insertion of the right and left calcaneus tendons; bilateral lameness was also observed. The Thompson test, Matles test and Simmond's/calf squeeze test were positive for bilateral injury.

Surgical treatment using the percutaneous technique with the help of the Achillon® device was chosen. Figures 1 to 4 show the sequence of the procedure performed.

In the postoperative period, the patient received support according to his pain tolerance. Non-hinged walking boots with 3-cm inner heels were used bilaterally to maintain 30-degree plantar flexion. The inner heel was kept in place for 45 days, and after its removal, the walking boots were used until the 60th postoperative day (Figure 5). Walking

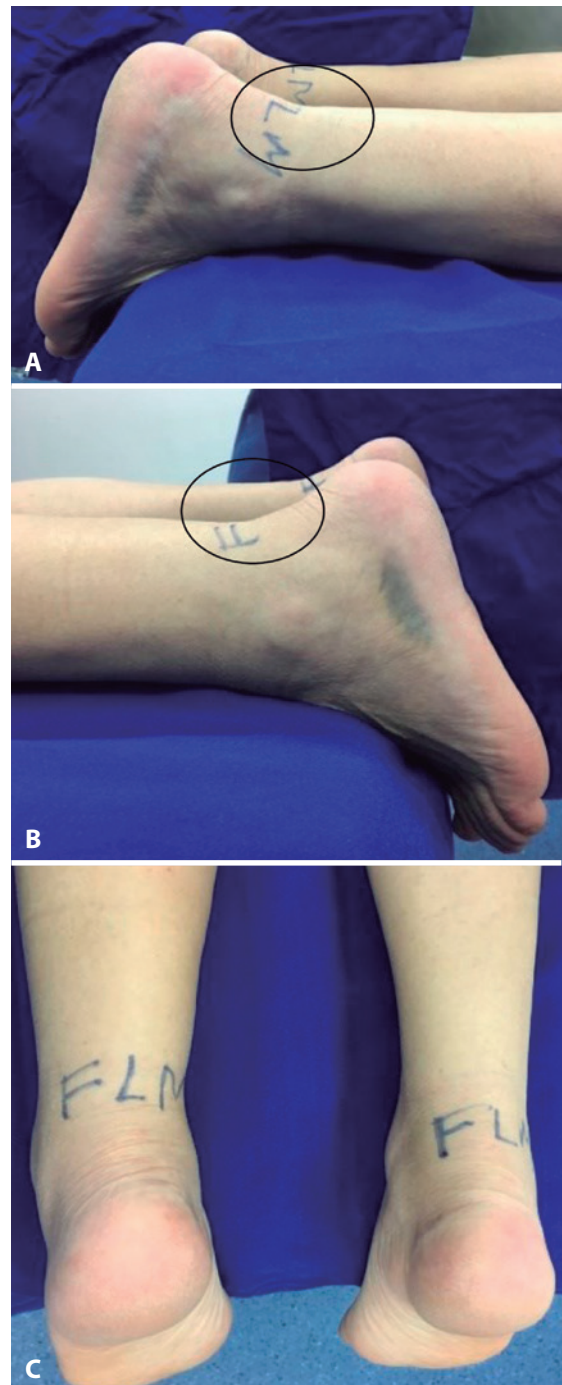


Figure 1. A. Right lower limb. B. Left lower limb, both in profile view. C. Posterior view of the lower limbs, demonstrating the bilateral gap marking.

Source: Author's personal archive.

without the boots was handled in a progressive manner and was accompanied by physical therapy sessions.

The patient was not able to perform the entire physical therapy follow-up care protocol as directed but did not experience difficulty walking with the boots, and he had full weight-bearing capabilities after surgery.

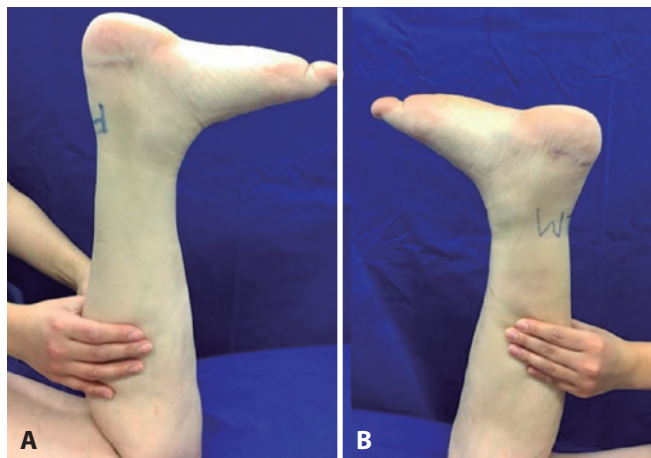


Figure 2. Thompson test - positive for bilateral injury: A. Right and B. Left.

Source: Author's personal archive.

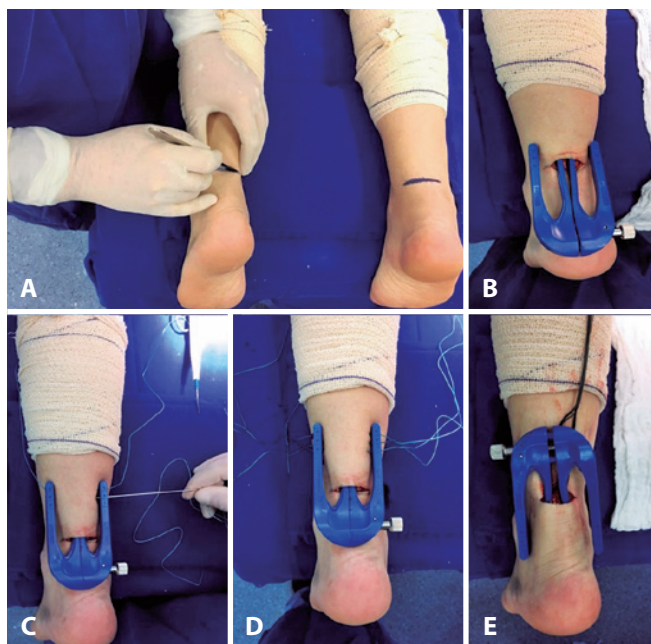


Figure 3. A. Longitudinal incision in the lower left limb, below the gap. B. Insertion of the Achillon system into the proximal tendon stump. C. Suturing using Ethibond suture and a long needle, from proximal to distal. D. Position of the sutures in the proximal stump. E. Introduction of the Achillon system distal to the ruptured stump and suturing from distal to proximal.

Source: Author's personal archive.

DISCUSSION

Tendinous injuries are usually associated with intrinsic and/or extrinsic factors. According to the systematic review by Magnan et al.⁽⁷⁾, their associated intrinsic factors include age, gender, body weight, systemic diseases, tendon temperature, flexibility, muscle fibres, previous injuries, anatomical variants, genetic predisposition and blood alterations. Extrinsic factors include the use of medications (antibiotics/fluoroquinolones and corticosteroids) and overloads.

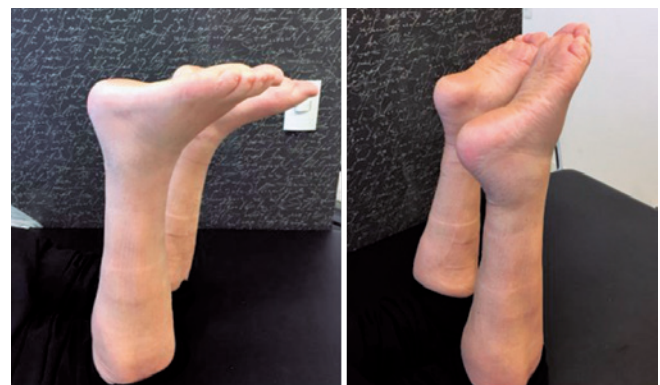


Figure 4. Sixty days after surgery, lateral view. Passive flexion-extension mobility.

Source: Author's personal archive.



Figure 5. Sixty days after surgery: A. Anterior view, B. Posterior view, C and D. Lateral view.

Source: Author's personal archive.

The injury mechanism may be traumatic or atraumatic. Bilateral injuries usually occur atraumatically and are associated with risk factors^(1,8).

Khanzada et al.⁽³⁾ reported the case of a bilateral atraumatic spontaneous Achilles tendon injury in a 78-year-old woman with no history of tendinopathy. The patient had been treated for a urinary tract infection with ciprofloxacin and corticoids, and she presented with symptoms in the lower limbs two days after starting the medication.

In the case reported, there was no trauma or association with the use of medication prior to the injury, which would constitute extrinsic factors. The patient was physically active and played soccer weekly. In terms of intrinsic risk factors, the patient presented with an age outside the prevailing curve, was male and had a comorbidity (diabetes).

The pathogenesis of tendinopathy is well discussed. There are several hypotheses, including neurogenic pathogenesis through repeated inflammatory processes that generate hypoxia in the tissue by hypovascularisation or local avascularisation, as well as antigenic pathogenesis after alteration of the extracellular matrix, through which there may be alterations in the local neovascularization and perfusion systems^(3,7).

Medications may also alter metabolism, especially quinolone antibiotics, particularly ciprofloxacin, which decreases fibroblast proliferation, collagen turnover, and proteoglycan synthesis⁽⁷⁾.

It is possible that repeated microtrauma, a physical condition observed in high-performance patients such as runners and jumpers, combined with intrinsic and/or extrinsic risk factors, could lead to fibre degeneration and decreased muscle strength, causing injury to the diseased tendon.

Treatment is debatable and controversial. It may be conservative or surgical. The choice of the best treatment should take into account the patient's age, gender, comorbidities, physical activity, and functional demands. Deng⁽⁹⁾ et al. performed a systematic review and meta-analysis comparing conservative treatment and surgical treatment and found that surgical treatment is the best option, as it is more efficient and reduces the chance of re-rupture.

Surgical treatment was indicated for the case reported here based on the patient's age, physical activity level and comorbidities. Surgery has its benefits, such as a faster recovery time and a lower chance of needing another intervention.

Karaasla et al.⁽¹⁾ reported the case of a 33-year-old male athlete with bilateral atraumatic spontaneous AT rupture for whom conservative treatment was chosen. The patient

was treated with immobilization in equinus for four weeks and in a neutral position for two more weeks. At four months of follow-up, the patient was doing well and walking without limitations. Similarly, Khanzada et al.⁽³⁾ reported the case of a 78-year-old woman who, after two days of corticosteroid and quinolone use, developed a bilateral AT injury. A similar immobilization protocol was chosen for her. The patient was placed in equinus (30 degrees) for four weeks, in mid-equinus (15 degrees) for two weeks, and in a neutral position for two weeks. Full weight-bearing was started only after twelve weeks, when the tendon was already healed.

There is no consensus regarding the immobilization times in maximum, mid- and neutral equinus or for early weight-bearing versus no weight-bearing in at least the initial weeks.

As for the surgical treatment, there are several techniques, and it can be open or closed.

Magnan et al.⁽⁷⁾ compared three techniques: percutaneous (modified Ma and Griffith's repair), mini-open and mini-open with the Achillon device. They concluded that the three techniques facilitate surgical treatment and yield satisfactory results. Daghino et al.⁽⁵⁾ compared conventional open and minimally invasive suture treatment with the Achillon device and observed favourable results with the minimally invasive technique; it led to fewer postoperative complications and faster functional improvement.

Early rehabilitation can lead to effective functional improvement. Huang et al.⁽⁶⁾ conducted a systematic review and meta-analysis and concluded that early weight-bearing and ankle mobility reduce complications and lead to better functional improvement compared with traditional immobilization. Clanton et al.⁽¹⁰⁾ compared a rehabilitation protocol after surgical treatment using three different surgical techniques and observed functional improvement with greater repair elongation and strength when the percutaneous minimally invasive technique was employed.

One limitation of this case report was the failure by the patient to follow the postoperative physical therapy regime correctly and complete the follow-up outpatient visits, but this had no effect on the final outcome. The scarce literature on the subject was also a limitation.

CONCLUSION

Achilles tendon rupture is usually associated with an extrinsic or intrinsic risk factor. The choice of the most appropriate treatment depends on the patient's characteristics, such as their age, comorbidities, functional demands and

work activities. There is no doubt that intensified postoperative rehabilitation reduces complications in the late post-

operative period, such as chronic lower limb pain, joint stiffness and lameness.

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REFERENCES

1. Karaaslan F, Yurdakul E, Baloglu M, Mermekaya MU, Karaglu S. Bilateral spontaneous atraumatic rupture of the Achilles tendon in an athlete. *Am J Emerg Med.* 2016 Jan;34(1):114.e1-2.
2. Yue D, Al-Hadithy N, Domos P. A case of spontaneous bilateral Achilles tendon rupture: surgical treatment with early mobilization. *Foot Ankle Spec.* 2014;7(1):74-6.
3. Khanzada Z, Rethnam U, Widdowson D, Mirza A. Bilateral spontaneous non-traumatic rupture of the Achilles tendon: a case report. *J Med Case Rep.* 2011;5:263.
4. Magnan B, Bondi M, Pierantoni S, Samaila E. The pathogenesis of Achilles tendinopathy: a systematic review. *Foot Ankle Surg.* 2014; 20(3):154-9.
5. Daghino W, Enrietti E, Sprio AE, di Prun NB, Berta GN, Massè A. Subcutaneous Achilles tendon rupture: A comparison between open technique and mini-invasive tenorrhaphy with Achillon® suture system. *Injury.* 2016;47(11):2591-2595.
6. Huang J, Wang C, Ma X, Wang X, Zhang C, Chen L. Rehabilitation regimen after surgical treatment of acute Achilles tendon ruptures: a systematic review with meta-analysis. *Am J Sports Med.* 2015;43(4): 1008-16.
7. Magnan B, Samaila E, Merlini M, Bartolozzi P. Sutura mini-invasiva del tendine di Achille. Descrizione di tre tecniche chirurgiche minimally invasive repair of acute tear of Achilles tendon. Three different options. *GIOT.* 2010; 36:125-30.
8. Macera A, Carulli C, Matassi F, Veneziani C, Innocenti M. Traumatic bilateral Achilles tendon rupture in a young athlete treated with percutaneous tenorrhaphy. *Joints.* 2016 Jan 31;3(4):218-20.
9. Deng S, Sun Z, Zhang C, Chen G, Li J. Surgical Treatment Versus Conservative Management for Acute Achilles Tendon Rupture: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Foot Ankle Surg.* 2017;56(6):1236-43.
10. Clanton TO, Haytmanek CT, Williams BT, Civitarese DM, Turnbull TL, Massey MB, Wijdicks CA, LaPrade RF. A Biomechanical Comparison of an Open Repair and 3 Minimally Invasive Percutaneous Achilles Tendon Repair Techniques During a Simulated, Progressive Rehabilitation Protocol. *Am J Sports Med.* 2015;43(8):1957-64.