Paratenon effusion of the Achilles tendon: a rare finding

Raphael Micheroli,[1,2] Vincenzo Ricci,[3] Ondřej Naňka,[4] Giorgio Tamborrini[1,5]

[1]Swiss Ultrasound Center, Institute of Rheumatology, Basel, Switzerland; [2]Department of Rheumatology, University Hospital Zurich, University of Zurich, Switzerland; [3]Physical and Rehabilitation Medicine Unit, Luigi Sacco University Hospital, ASST Fatebenefratelli-Sacco, Milan, Italy; [4]Institute of Anatomy, First Faculty of Medicine, Charles University, Prague, Czech Republic; [5]Clinic for Rheumatology, University Hospital of Basel, Switzerland

Correspondence: Raphael Micheroli, Department of Rheumatology, University Hospital Zurich, University of Zurich, Rämistrasse 100, 8091 Zurich, Switzerland.
E-mail: raphael.micheroli@usz.ch

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Summary

We present a case of Achilles tendon swelling and pain related to paratenon effusion. Further ultrasound assessment showed no evidence of acute enthesitis, although a nonspecific degenerative enthesophyte was present. Our case study presents a rare instance of paratenonitis involving effusion into the paratenon lumen. Paratenonitis has a non-specific etiology. Recent findings suggest that paratenonitis plays a role not only in cases of mechanical injury and in patients with spondyloarthritis but also in individuals at risk of developing rheumatoid arthritis. Further studies have shown that the paratenon surrounding the extensor tendons consists of a lining layer formed by fibroblasts. However, more research is needed to characterize these fibroblasts and compare them to those found in the synovium.

Introduction

Achilles tendon pain often poses diagnostic complexities. It frequently masquerades as tendinopathy, enthesopathy, enthesitis, and others. When initial conservative treatments provide no relief, a thorough evaluation is essential to determine the underlying cause. Here, we present a case report of a patient with mechanical-induced paratenonitis, accompanied by the rare occurrence of an effusion in the paratenon lumen.

Case Report

A 65-year-old male patient experienced pain and swelling around the left Achilles tendon after walking long distances in new winter shoes; he reported no specific trauma. The patient was otherwise healthy with no history of hypercholesterolemia, renal disease, calcium-pyrophosphate deposition disease (a clinically asymptomatic chondrocalcinosis of a single meniscus after knee arthroscopy years earlier was known), gout, rheumatoid arthritis, or spondyloarthritis, and he did not perform specific sports activities and took no regular medications, especially no recent use of corticosteroids or fluoroquinolones. Laboratory results, such as uric acid levels or signs of inflammation, were normal. Clinically, the left tendon appeared significantly thicker than the right, and the swollen region was tender and painful when standing on tiptoes. Further ultrasound assessment showed no evidence of acute enthesitis (*e.g.*, hypoechogenicity, thickening, or Doppler signal at the insertion site), but an asymptomatic degenerative enthesophyte was present. The tendon itself was thickened, with intratendinous calcification and hyperaemia (Figure 1) (1). A compressible fluid collection was visible around the tendon on its dorsal aspect. Further assessment revealed edematous distension of the thickened paratenon (Figure 2A and B and *Supplementary Video*).

The patient underwent a conservative treatment regimen involving taping, physiotherapy, and local non-steroidal anti-inflammatory drugs, which led to an improvement in his condition over time.

Discussion and Conclusions

Our case highlights a rare finding of an instance of benign paratenonitis with effusion of the paratenon lumen. The symptoms occurred after a long walk wearing new winter boots. While overuse as a mechanical cause is plausible, it is also possible that the paratenonitis developed due to compression of the tendon by the boots. One limitation of the study is that we did not examine the asymptomatic, clinically inconspicuous side for comparison. The paratenon at the level of the Achilles tendon is a complex structure that is connected to the crural fascia (2). Figure 2C and D show the histology of an 87-day-old fetus; while mechanical forces and aging may alter anatomical structures, the fundamental anatomy is evident. So far, paratenonitis or peritendinitis has been described as a hypoechogenic thickening of the tendon surroundings, with the occasional presence of a Doppler signal. However, a precise definition is lacking so far (3). Our case illustrates that the common definition of paratenonitis should possibly be extended to include the presence or absence of effusion. In line with our findings, a recent publication showed that the paratenon has a true lumen (4). Paratenonitis is non-specific regarding its etiology. Recent findings suggest a role for paratenonitis not only in mechanical causes and in patients with spondyloarthritides but also in patients at risk for the development of rheumatoid arthritis (5),

especially when present at the extensor tendon at the level of the metacarpophalangeal joint (6). Further studies indicated that the paratenon surrounding the extensor tendons consists of fibroblasts forming a lining layer (7). However, further research is needed to characterize paratenon fibroblasts and compare them to synovial fibroblasts.

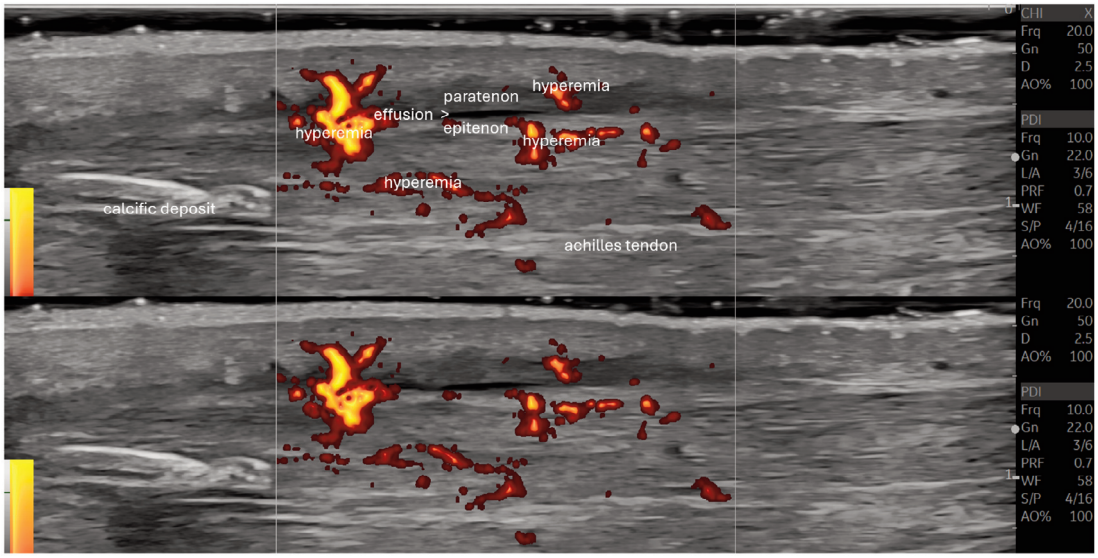

Figure 1. Longitudinal ultrasound images of the Achilles tendon in Power Doppler mode show hyperaemia of the Achilles tendon and of the paratenon. Furthermore, effusion in the paratenon lumen and calcific deposits are depicted.

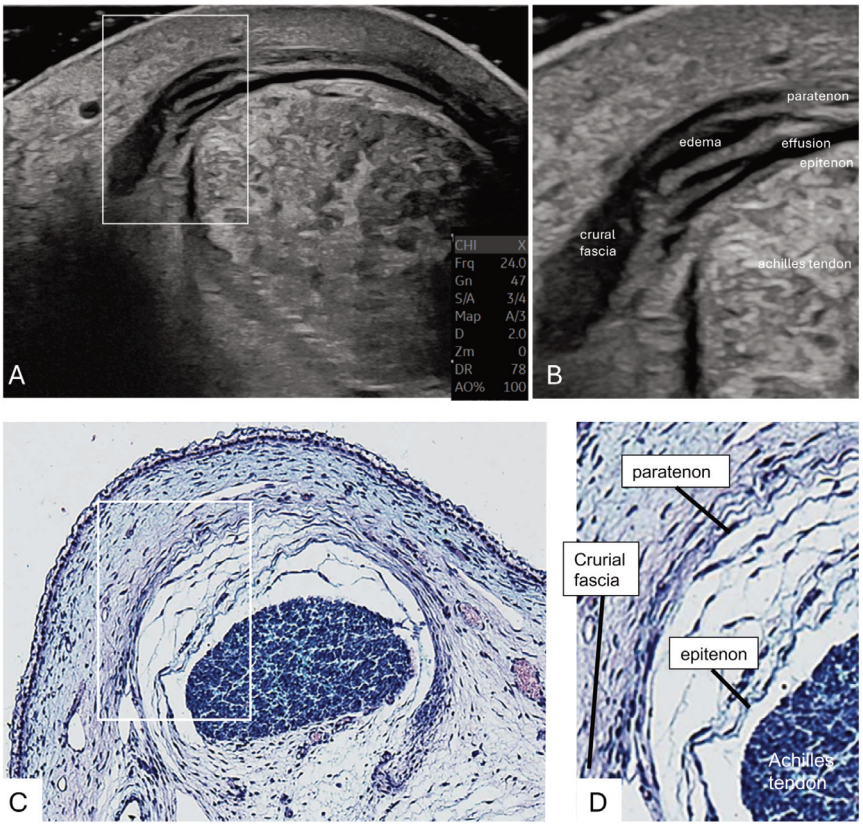

Figure 2. Cross-sectional ultrasound images of the Achilles tendon show a paratenon effusion in the lumen of the thickened paratenon (**A** and **B**). Histology of the paratenon shows the complex structure, including the paratenon, epitenon, and crural fascia (**C** and **D**) (87-day human fetus, staining with Mayer's hematoxylin and eosin).

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Online supplementary material

Supplementary Video. Longitudinal (seconds 0 - 6) and transverse (seconds 7- 26) B-mode ultrasound video of the Achilles tendon showing a paratenon effusion in the lumen of the thickened paratenon.