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Concomitant Achilles Tendon Rupture and Ankle Fracture in a Snowboarder Managed with Early Rehabilitation: A Case Report

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Learning Point of the Article:

The combined injury of Achilles rupture and ankle fracture has no established rehabilitation consensus – this case demonstrates an early, protocol-driven timeline can be both safe and effective.

Abstract

Introduction: Achilles tendon rupture and ankle fracture are each common in isolation, but their simultaneous occurrence in the same limb is rare. Because the two injuries share overlapping signs of pain, swelling, and functional limitation, one is often missed on initial evaluation, and a low threshold for combined clinical and sonographic or magnetic resonance imaging assessment is warranted in high-energy ankle trauma. Furthermore, while early functional weight-bearing is increasingly favored for isolated Achilles ruptures, its safety and implementation in combined injuries remain poorly defined.

Case Report: A 34-year-old male sustained a closed Weber B bimalleolar ankle fracture and a complete Achilles tendon rupture during a high-energy snowboarding accident. Both injuries were identified preoperatively by clinical examination (palpable tendon defect, positive Thompson, and Matles tests) and ultrasonography. One week after injury, he underwent open reduction and internal fixation of the lateral malleolus with a lateral approach followed by repair of the Achilles using a Krackow-type suture-tape repair docked to the calcaneus with two SwiveLock anchors (Arthrex, Naples, FL). This was done through a separate posterior longitudinal incision. Intraoperative external rotation stress testing demonstrated no talar shift or medial malleolar fracture displacement, confirming stability and avoiding unnecessary medial fixation. At 1 week postoperatively, the patient was transitioned from a posterior splint to a boot with a heel wedge, and active range of motion was initiated. At 2 weeks, the patient was allowed to bear full weight in the boot with a heel wedge. Formal physical therapy began at 4 weeks.

Conclusion: Concomitant Achilles tendon rupture and ankle fracture require a high index of suspicion for both injuries. Intraoperative stress testing after fibular fixation can guide the decision to forgo medial malleolar fixation. In addition, an early, protected rehabilitation protocol can be successfully implemented in patients with a combined Achilles rupture and malleolar fracture.

Keywords: Achilles tendon rupture, bimalleolar ankle fracture, Weber B fracture, intraoperative stress testing, snowboarding injury, early rehabilitation.

Introduction

Achilles tendon rupture and ankle fracture are common orthopedic injuries in isolation, but their simultaneous occurrence in the same limb is rare, with reported patterns ranging from isolated medial or lateral malleolar fractures to bimalleolar and trimalleolar fractures, open tibia-fibula fractures, and even talar neck fractures [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15]. Because pain, swelling, and functional limitation from an ankle fracture can obscure the clinical findings of an Achilles rupture – and vice versa – one

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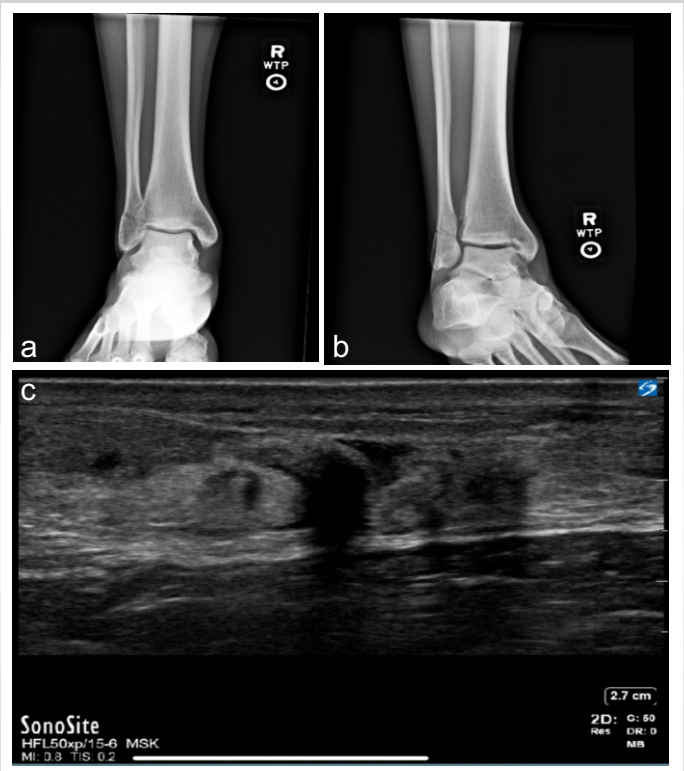


Figure 1: (a) Pre-operative anterior-posterior radiograph demonstrating a Weber B distal fibular fracture with no talar shift, (b) pre-operative mortise radiograph showing an associated non-displaced medial malleolar fracture, (c) pre-operative ultrasound of the Achilles tendon demonstrating complete disruption approximately 4 cm proximal to the calcaneal insertion with approximately 2 cm of tendon retraction.

injury is frequently missed on initial evaluation, in some cases not identified until days to weeks after the index surgery [1,2,3,4,5,6,7,8,9,13,14]. Prior reports describe forced dorsiflexion, hyperextension, or inversion under tendon tension as the typical mechanism, often in high-energy settings such as skiing, snowboarding, motor vehicle collisions, and falls; non-sporting mechanisms involving rapid deceleration during exercise have also been reported [1,2,5,6,7,8,11]. Diagnosis is generally achievable with a thorough clinical examination and radiographs, with ultrasound or magnetic resonance imaging added when tendon injury is suspected, depending on clinical circumstances and the surgeon's practice pattern.

We present a closed Weber B bimalleolar ankle fracture with a complete Achilles tendon rupture sustained during a snowboarding accident, in which both injuries were diagnosed preoperatively. Intraoperative stress testing, rather than fracture displacement alone, guided the decision to withhold fixation of a non-displaced medial malleolar fracture. Following fixation, the patient successfully underwent a structured early weight-bearing protocol.

Case Report

A 34-year-old male presented with right ankle pain and weakness after a high-energy snowboarding injury in January of 2025, sustained when the bottom of his snowboard struck a tree, forcing the ankle into sudden dorsiflexion. Examination revealed diffuse swelling, tenderness over both malleoli, a palpable Achilles tendon defect, and positive Thompson and Matles tests. Radiographs demonstrated a Weber B distal fibular fracture with an associated non-displaced medial malleolar fracture with no talar shift (Fig. 1a and b). Ultrasonography confirmed a full-thickness Achilles tendon rupture approximately 4 cm proximal to its calcaneal insertion with approximately 2 cm of retraction (Fig. 1c).

One week after injury, the patient underwent surgery under regional anesthesia in the prone position. A lateral approach of the fibula was used to access the lateral malleolus, and a posterior longitudinal incision was used to access the Achilles. Open reduction and internal fixation of the lateral malleolus was performed first using a distal fibula plate (Arthrex, Naples, FL). Following fibular fixation, intraoperative stress testing

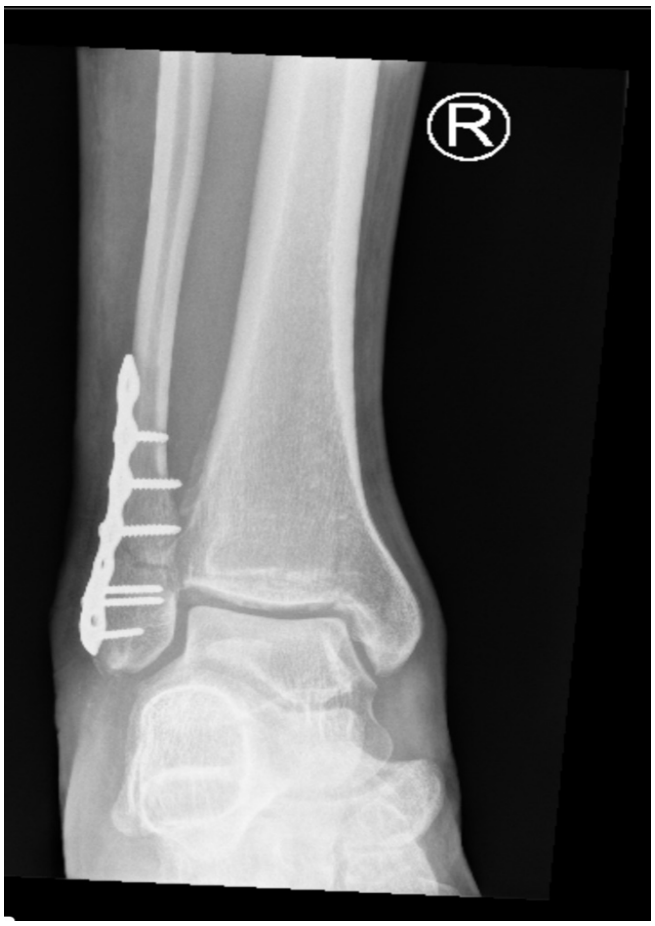


Figure 2: One-week post-operative radiograph. One-week post-operative mortise radiograph of the right ankle demonstrating maintained alignment and progressive healing following fixation of the Weber B fibular fracture as well as a non-displaced medial malleolar fracture.



Figure 3: Three-month post-operative radiographs. (a) Three-month post-operative anteroposterior radiograph showing anatomic alignment with complete healing of the fractures, (b) 3-month post-operative mortise radiograph demonstrating maintained joint congruity and full osseous integration.

demonstrated a stable ankle mortise without talar shift or displacement of the medial malleolus fracture; therefore, no internal fixation was required. The Achilles tendon rupture, identified approximately 4 cm proximal to its calcaneal insertion, was repaired using suture tape in a Krackow-type locking configuration docked into the calcaneus utilizing two SwiveLock anchors (Arthrex Naples, FL), restoring tendon continuity and tension. The ankle was placed in plantarflexion and immobilized in a post-operative splint.

At 1 week postoperatively, radiographs were taken, which confirmed appropriate hardware alignment and progressive healing of the fractures (Fig. 2). The patient transitioned to a controlled ankle-motion boot with a heel wedge, remaining touchdown weight-bearing. At 2 weeks, he was allowed to fully weight-bear in the boot. Formal physical therapy began at 4 weeks.

At 3 months postoperatively, radiographs continued to demonstrate anatomical alignment and complete healing of both fractures (Fig. 3). The Achilles tendon remained clinically intact, with 10° of dorsiflexion and 30° of plantarflexion, independent ambulation without a boot, and the ability to perform a double-leg toe rise. There were no signs of infection or wound complication, and the patient reported satisfaction with his recovery.

At 6 months postoperatively, physical examination demonstrated well-healed surgical sites, a non-tender, intact Achilles, 5/5 strength, full range of motion, and a stable ankle joint (Fig. 4).

At 1 year postoperatively, the patient reported via telephone that he had returned to snowboarding again without issues.

Discussion

Combined Achilles tendon rupture and ipsilateral ankle fracture is uncommon, and the two injuries can mask one another on initial presentation [1,2,3,4,5,6,7,8,9]. A thorough examination assessing both Achilles continuity and osseous integrity is warranted in high-energy ankle trauma. In this case, both injuries were identified before surgery through clinical examination and ultrasonography, allowing single-stage operative treatment.

The medial malleolar fracture was left unfixed based on intraoperative confirmation of mortise stability after fibular fixation, rather than fracture displacement alone. Prior reports have shown that select non-displaced medial malleolar fractures can be managed nonoperatively [2,3], but this case adds the specific step of stress-testing the mortise intraoperatively after fibular fixation as the basis for that decision, limiting additional medial dissection while confirming stability objectively rather than presumptively.

Early weight-bearing following isolated Achilles tendon repair or isolated ankle fracture fixation is well established, but



Figure 4: Six-month post-operative clinical photographs. (a) Clinical photograph demonstrating plantarflexion range of motion, (b) clinical photograph demonstrating dorsiflexion range of motion, (c) clinical photograph displaying healed surgical incision and contour of the Achilles tendon.

published reports have not consistently applied this pace to the combined injury. Maffulli and Richards allowed their patient to weight bear "as soon as he felt comfortable," [2] but their medial malleolar fracture was non-displaced and never surgically addressed, making weight bearing patient-paced rather than protocol-driven. Cruz et al. described a soldier with bilateral Achilles ruptures and an ipsilateral, surgically fixed medial malleolar fracture who underwent an accelerated rehabilitation protocol; even there, the fracture-affected limb was started at 6 weeks postoperatively, slower than the contralateral limb without a fracture [16]. This gap has been noted directly in the recent literature: Morley et al. described the same injury combination as posing a "rehabilitation dilemma," noting that no international consensus exists for its optimal management [17]. In the present case, a structured protocol advanced to full weight bearing by 4 weeks despite an internally fixed fibula, based on objective intraoperative confirmation of mortise stability rather than fracture displacement, patient comfort, or the presence of surgical fixation alone. This distinguishes the present case from prior reports and suggests that, when mortise stability is explicitly confirmed at the time of surgery, an early rehabilitation timeline comparable to that used for isolated injuries can be extended to the combined injury.

The Achilles tendon was repaired with a Krackow-type locking suture technique with anchors, consistent with prior reports of combined injury [1,2,5]. As a single case, this cannot establish that early rehabilitation is superior to more conservative protocols, but it illustrates that it can be implemented successfully in a carefully selected patient once mortise stability is intraoperatively confirmed and the Achilles repair is secure.

Conclusion

Concomitant Achilles tendon rupture and ankle fracture require a high index of suspicion for both injuries, particularly after high-energy sporting trauma. Intraoperative stress testing after fibular fixation can objectively guide the decision to withhold medial malleolar fixation, and early, protected rehabilitation can be successfully implemented in select patients with a stable, surgically treated ankle fracture.

Clinical Message

Following combined Achilles tendon repair and stable ankle fracture fixation, implementing an early protected weight-bearing protocol (advancing to full weight-bearing in a boot at 2 weeks) is feasible and does not compromise structural stability.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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