Cureus
Part of SPRINGER NATURE

Open Access Case Report

Isolated Ankle Syndesmotic Rupture: A Case Report

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Review began 09/28/2026
Review ended 10/10/2026
Published 10/22/2026

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DOI: 10.7759/cureus.118380

Abstract

This report describes a case of acute, isolated rupture of the ankle syndesmosis in a 36-year-old man with no significant past medical history, sustained after a fall from a skateboard with an external rotation mechanism of injury. Plain radiographs demonstrated widening of the medial ankle mortise and the distal tibiofibular joint without an associated fracture, findings consistent with syndesmotic instability. The patient underwent operative repair consisting of clamp-assisted reduction, neutralization plating of the distal fibula, and suture-button (TightRope) fixation of the syndesmosis, with an uncomplicated postoperative course. This case highlights the importance of maintaining a high index of clinical suspicion for syndesmosis injury in patients with an external rotation mechanism, even when initial radiographs show no fracture, since isolated syndesmotic ruptures are easily overlooked yet carry a meaningful risk of chronic instability and early post-traumatic arthritis if missed or inadequately treated.

Categories: Trauma, Sports Medicine, Orthopedics
Keywords: ankle instability, suture-button fixation, syndesmosis injury, tightrope fixation, trauma and orthopedic surgery

Introduction

The distal tibiofibular syndesmosis is a fibrous joint stabilized by the anterior inferior tibiofibular ligament, posterior inferior tibiofibular ligament, transverse tibiofibular ligament, and interosseous ligament/membrane. Together, these structures maintain the fibula within the tibial incisura and are essential for preventing excess fibular motion in multiple directions: anterior-posterior translation, lateral translation, and internal and external rotation [1].

Most syndesmotic injuries are caused by forces that result from external rotation of the ankle at the end-range of dorsiflexion or a combination of ankle dorsiflexion associated with adduction or abduction of the foot. The forces together will produce a widening of the fibula relative to the tibia at the ankle, disrupting the ligaments, and resulting in talar instability. Additionally, because of these injuries, the posterior tubercle functions as a fulcrum about which the fibula will spin around in the lateral direction. Syndesmotic injuries account for approximately 18% of ankle sprains, with the reported incidence increasing to 12% to 32% among athletic populations [2,3].

Isolated syndesmotic injuries without an associated malleolar fracture are particularly susceptible to underdiagnosis, as plain radiographs may appear unremarkable despite the presence of isolated ligamentous injury. Although magnetic resonance imaging (MRI) has demonstrated high sensitivity and specificity for detecting syndesmotic injuries, its relatively high cost may limit its use in the initial evaluation [4]. Conventional radiographs remain the primary imaging modality for assessing acute ankle injuries, particularly to exclude associated fractures. However, their diagnostic reliability in identifying syndesmotic ligament injuries remains questionable, as ligamentous disruption may occur without obvious radiographic abnormalities. Therefore, a combination of injury mechanism, clinical examination findings, and advanced imaging when indicated is essential for accurate diagnosis [4,5]. Individual physical examination maneuvers such as the squeeze test and external rotation stress test have shown inconsistent diagnostic accuracy across studies, although a combination of mechanism, clinical suspicion, and exam findings appears more reliable than any single test in isolation [4,5]. Missed or inadequately stabilized syndesmotic injuries can progress to chronic instability, malreduction, and early post-traumatic osteoarthritis, which makes prompt recognition and, when indicated, anatomic surgical stabilization clinically important [2,3].

We present a case of an isolated, fracture-free syndesmosis rupture diagnosed on plain radiography and managed surgically with a hybrid plate-and-suture-button construct, and we discuss the diagnostic and management principles this case illustrates.

Case Presentation

A 36-year-old man (weight 90 kg and BMI 31.1 kg/m^2) with no significant past medical history presented to

the emergency department four hours after a fall from his skateboard that externally rotated his ankle. He complained of right ankle pain and swelling.

Upon physical examination, the right ankle was swollen without gross deformity. Sensation and motor function were intact in the right lower extremity. There was tenderness to palpation and edema about the right ankle, with a normal range of motion. The calf was non-tender, and distal pulses were full and equal bilaterally.

Plain radiographs of the right lower extremity demonstrated widening of the medial ankle mortise and the distal tibiofibular joint, with associated soft tissue swelling and no acute fracture or osseous destruction - findings suggestive of a right ankle syndesmosis injury (Figures *1*, *2*).

The patient was immobilized in a posterior splint and discharged from the emergency department with orthopedic follow-up scheduled within one week. At the subsequent clinic visit, operative repair of the right ankle syndesmosis was planned for the following week. The procedure was completed without complications and was well tolerated. Intraoperatively, the syndesmosis was reduced using a clamp extending from the medial tibia to the lateral fibula. A two-hole plate was positioned along the lateral fibula at the level of the syndesmosis, and definitive stabilization was achieved using suture-button (TightRope; SYNDEX Knotless syndesmosis repair fixation system with constrictor, medline, Northfield, IL, USA; two tight ropes were used and a two-hole sudebisus plate was used) fixation across the tibiofibular syndesmosis. C-arm fluoroscopy was used throughout the procedure to verify and maintain satisfactory reduction.



FIGURE 1: Three-view ankle radiographs of a 36-year-old man demonstrating widening of the distal tibiofibular syndesmosis, consistent with syndesmotic disruption, without evidence of an associated acute fracture.

Anteroposterior view (A), mortise view (B), and lateral view (C). Imaging shows no acute fracture, exostosis in the distal tibial metaphysis, widening of ankle mortise, and widening of the distal tibiofibular joint.

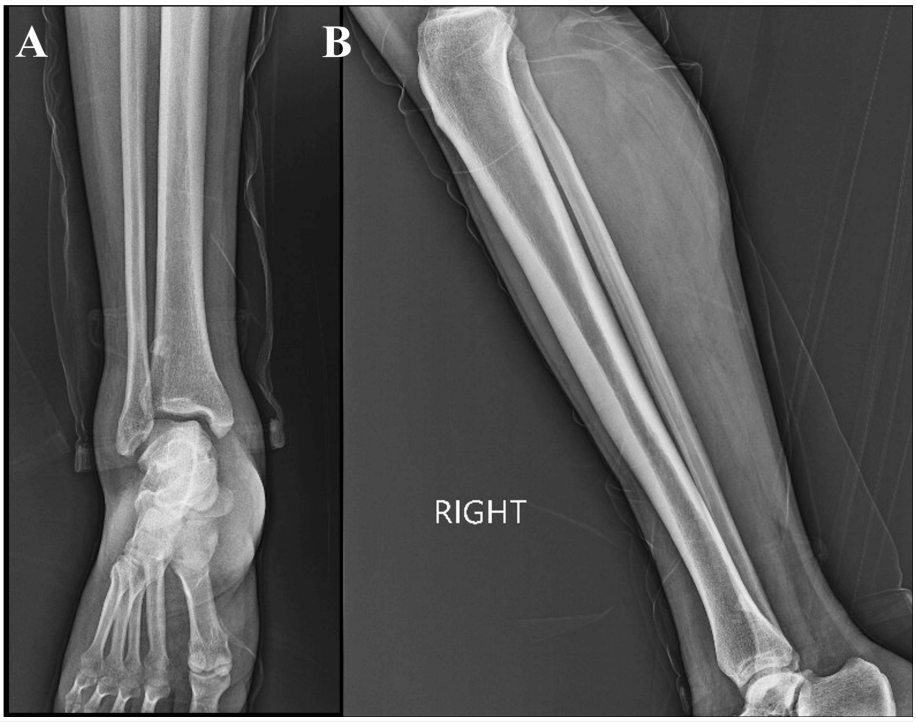


FIGURE 2: Two view X-ray of right tibia and fibula of a 36-year-old man who presented with right ankle pain and swelling post skateboard accident.

Anteroposterior view (A), and lateral view (B). Imaging shows no acute fracture, and no bone destruction. There is soft tissue swelling about the ankle, and tibiotalar joint asymmetry with lateral widening, raising the possibility of ligamentous injury.

Operative treatment adhered to established principles of syndesmotic fixation, including anatomic reduction under fluoroscopic guidance, neutralization of the distal fibula with a laterally positioned two-hole plate, and dynamic stabilization of the tibiofibular syndesmosis using a suture-button (TightRope) device. This hybrid construct combines the rotational stability provided by the plate with the controlled physiologic micromotion allowed by suture-button fixation.

Postoperatively, the patient remained non-weight-bearing on the right leg for the first week. Early range of motion exercises were initiated during the second week, followed by progression to protected partial weight-bearing by the third week. Advancement to full weight-bearing and formal physical therapy was guided by soft-tissue recovery and radiographic evidence of healing. Orthopedic follow-up was arranged to evaluate wound healing, confirm maintenance of syndesmotic reduction on serial radiographs, and monitor functional recovery.

Discussion

The central management of syndesmosis injuries is very well illustrated in this case. Firstly, an isolated syndesmotic rupture can occur without any associated malleolar fracture, and the radiographic clues - mortise widening and increased tibiofibular clear space - can be subtle relative to the degree of underlying ligamentous disruption [1,6].

Sman et al. confirmed that it is important to have a combination of sensitive and specific signs, symptoms, and tests to confirm ankle syndesmosis involvement [3]; an inability to hop, combined with syndesmosis ligament tenderness (92% sensitive), and dorsiflexion-external rotation stress test (sensitive) may be combined with pain out of proportion to injury and the squeeze test (specific). Most of the time, a positive result may be found during dorsiflexion and external rotation of the foot.

Once instability is confirmed, the choice of fixation construct meaningfully affects outcomes. Comparative and meta-analytic data have generally favored suture-button devices over static syndesmotic screws, citing higher American Orthopaedic Foot and Ankle Society (AOFAS) [7] and Olerud-Molander [8] scores, fewer hardware-related complications, and reduced need for planned implant removal, while acknowledging that syndesmotic screws remain a reliable, lower-cost option, particularly when intraoperative reduction is technically difficult to control dynamically [6,9,10]. The hybrid construct used in this case - a neutralization

plate combined with suture-button fixation - reflects an effort to combine the rotational stability of rigid fixation with the physiologic flexibility of dynamic fixation. This approach has been associated with improved functional outcome scores, fewer hardware-related reoperations, and earlier progression to weight-bearing compared with rigid syndesmotic screw fixation alone [6,9,10]. Nevertheless, syndesmotic screw fixation remains a well-established and effective treatment option [1,9].

The limitations of this report include its single-patient design and the absence, at the time of writing, of mid- and long-term functional outcome data, which should be added once available to complete the clinical picture.

Conclusions

Isolated ankle syndesmosis rupture without fracture is an under-recognized injury that demands a high index of clinical suspicion in patients with an external rotation mechanism, even when initial radiographs appear reassuring. In this patient, prompt identification of mortise and syndesmotic widening on plain radiographs led to timely operative stabilization with a combined plate-and-suture-button construct and an uncomplicated early course. Continued follow-up will be important to confirm maintenance of reduction and functional recovery.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Henry K. Mah, Mariam Zafar Khan, Linda V. Do, Thomas Larkin

Acquisition, analysis, or interpretation of data: Henry K. Mah, Mariam Zafar Khan, Linda V. Do, Thomas Larkin

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

Claude (Anthropic, San Francisco, CA, USA) was utilized during the drafting of this manuscript. AI was utilized for the preparation to assist with drafting portions of the introduction and discussion, improving grammatical clarity and sentence structure, and identifying relevant scientific literature. The authors reviewed and revised the AI-assisted content and verified the accuracy and relevance of the cited references. The clinical case presentation, surgical treatment, postoperative course, and radiographic images were provided by the authors. The authors take full responsibility for the scientific accuracy, originality, and integrity of the final manuscript.

References

1. Hermans JJ, Beumer A, de Jong TA, Kleinrensink GJ: Anatomy of the distal tibiofibular syndesmosis in adults: a pictorial essay with a multimodality approach. J Anat. 2010, 217:633-45. 10.1111/j.1469-7580.2010.01302.x
2. McCollum GA, van den Bekerom MP, Kerkhoffs GM, Calder JD, van Dijk CN: Syndesmosis and deltoid ligament injuries in the athlete. Knee Surg Sports Traumatol Arthrosc. 2013, 21:1328-37. 10.1007/s00167-012-2205-1
3. Porter DA, Jaggers RR, Barnes AF, Rund AM: Optimal management of ankle syndesmosis injuries . Open Access J Sports Med. 2014, 5:173-82. 10.2147/OAJSM.S41564
4. Sman AD, Hiller CE, Refshauge KM: Diagnostic accuracy of clinical tests for diagnosis of ankle syndesmosis

injury: a systematic review. Br J Sports Med. 2013, 47:620-8. 10.1136/bjsports-2012-091702

5. Baltes TP, Al Sayrafi O, Arnáiz J, et al.: Acute clinical evaluation for syndesmosis injury has high diagnostic value. Knee Surg Sports Traumatol Arthrosc. 2022, 30:3871-80. 10.1007/s00167-022-06989-2
6. Yawar B, Hanratty B, Asim A, Niazi AK, Khan AM: Suture-button versus syndesmotic screw fixation of ankle fractures: a comparative retrospective review over one year. Cureus. 2021, 13:e17826. 10.7759/cureus.17826
7. Kitaoka HB, Alexander IJ, Adelaar RS, Nunley JA, Myerson MS, Sanders M: Clinical rating systems for the ankle-hindfoot, midfoot, hallux, and lesser toes. Foot Ankle Int. 1994, 15:349-53. 10.1177/107110079401500701
8. Olerud C, Molander H: A scoring scale for symptom evaluation after ankle fracture . Arch Orthop Trauma Surg (1978). 1984, 103:190-4. 10.1007/BF00435553
9. Zhang P, Liang Y, He J, Fang Y, Chen P, Wang J: A systematic review of suture-button versus syndesmotic screw in the treatment of distal tibiofibular syndesmosis injury. BMC Musculoskelet Disord. 2017, 18:286. 10.1186/s12891-017-1645-7
10. Naqvi GA, Cunningham P, Lynch B, Galvin R, Awan N: Fixation of ankle syndesmotic injuries: comparison of tightrope fixation and syndesmotic screw fixation for accuracy of syndesmotic reduction. Am J Sports Med. 2012, 40:2828-35. 10.1177/0363546512461480