Orthopedics and Rheumatology
Open Access Journal
ISSN: 2471-6804

Juniper Publishers
key to the Researchers

Research Article
Volume 25 issue 2- December 2025
DOI: 10.19080/OROAJ.2025.25.556164

Ortho & Rheum Open Access J

Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique

Lázaro Martín Martínez Estupiñan[1], Jaciel García Piñero[2], Leonardo Martínez Aparicio[1], Ramón Delgado Carro[3], Alejandro Gómez Sarduy[2] and Claribel Plain Pazos[4]*

[1]Doctor in Medical Sciences, II Degree Specialist in Orthopedics and Traumatology, Full Professor, Provincial General University Hospital, Cuba

[2]I Degree Specialist in Orthopedics and Traumatology, Instructor Professor, Provincial General University Hospital, Cuba

[3]I and II Degree Specialist in Orthopedics and Traumatology, Assistant Professor, Provincial General University Hospital, Cuba

[4]I and II Degree Specialist in Comprehensive General Medicine, Faculty of Medical Sciences of Sagua la Grande, Cuba

Submission: November 26, 2025; **Published**: December 09, 2025

***Corresponding author:** Claribel Plain Pazos, Faculty of Medical Sciences of Sagua la Grande, Villa Clara, Cuba

Abstract

The syndesmosis is a joint without cartilage between the tibia and fibula that is formed only by fibrous tissue that joins these two bones on their lateral and medial surfaces respectively. Of note, classifications of ankle fractures are based on the status of the syndesmosis and its stability, reflecting its clinical and functional significance. This exploratory bibliographic review was carried out with the objective of characterizing the treatment methods of distal tibiofibular syndesmal injuries, for which a total of 34 bibliographic references were consulted. Isolated lesions of the syndesmosis may appear to be rare, but perhaps they are underdiagnosed lesions whose true incidence is completely unknown. Dynamic fixation with button suture decreases the possibility of post-traumatic arthritis and eliminates the disadvantages of the screw osteosynthesis technique.

Keywords: Ankle; Tibiofibular syndesmosis; Rigid fixation; Dynamic fixation; Injuries

Introduction

The ankle is an intermediate joint between the leg and foot segments and is formed by the lower parts of the tibia and fibula bones on one side and the talus on the other. The first two form a vault into which the dome of the third fits, called the tibiotalar-fibular joint [1]. Injuries to the distal tibiofibular syndesmosis represent 20% of ankle ligament injuries, and approximately 5% require surgery [2]. Others report that the incidence of isolated injury to the distal tibiofibular syndesmosis is 18%, and it is observed in 10% to 23% of ankle fractures. The incidence of ankle fractures, according to Xie et al. is 112 to 187 cases per 100,000 inhabitants per year, and 40% of these involve the posterior malleolus. In Cuba, ankle fractures are a common condition, with an increasing incidence due to sports and accidents [3,4]. Knowledge of the anatomy and biomechanics of this joint is vitally important to address potential injuries, which often go unnoticed [5,6]. Because the deltoid ligament is the primary stabilizer of the ankle, an injury to the syndesmosis can further compromise the stability and congruity of the mortise. A cadaveric study found that a complete single injury to the syndesmosis in a cadaveric ankle produces a 2 mm mortise diastasis, and when this injury is accompanied by a transection of the deep deltoid complex, the diastasis can extend up to 3.7 mm, corroborating the importance of the deltoid ligament [5].

It is noteworthy that ankle fracture classifications are based on the status of the syndesmosis and its stability, reflecting its clinical and functional significance. Instability caused by trauma can often be hidden and become evident through its sequelae sometime after the initial trauma. A multitude of radiographic measurements have been described in the three basic projections of the ankle that attempt to objectify a separation of the tibia and fibula or an instability of the syndesmosis under certain manipulations with anesthesia or during the surgical procedure [7]. Repairing the injury to achieve a normal, elastic tibiofibular pincer is the goal of treatment for these injuries. There are multiple methods for achieving adequate syndesmosis reduction that can be found described in the literature: manual direct reduction techniques, assisted with forceps or clamps, Kirschner wires, and AO screws. New techniques have recently been introduced that do not require implant removal, which appear to offer an advantage by reducing the number of necessary interventions. Therefore, we aim to analyze the treatment methods for distal tibiofibular syndesmosis injuries and present minor modifications to the technique that allow us to use it without the special devices initially described.

Methods

A systematic literature review was conducted, which included various texts, articles, and printed and digital materials related to distal tibiofibular syndesmosis injuries. The SciELO, Medigraphic, and PubMed databases and directories were consulted, using the following search terms in Spanish to expand the results: "tibiofibular syndesmosis" and "treatment of distal tibiofibular syndesmosis injuries."

The inclusion criteria for the selection were:

- Articles available on the selected data portals related to the topic,
- Free articles.

Letters to the editor and duplicate articles were excluded.

235 articles were reviewed, of which 35 were selected, both nationally and internationally, published between 2000 and 2025. The types of documents selected were: original articles and bibliographic reviews.

Development

Classification of Ankle Injuries

Throughout history, there have been several attempts to classify ankle fractures, each with their strengths and weaknesses. As is generally the case, the most popular ones are those that are simplest and most reproducible, demonstrating their usefulness in deciding treatment and predicting outcome. In our region, the most cited classification is the Danis-Weber classification, which is a simple system for categorizing ankle fractures involving the fibular malleolus. It is based primarily on the level of the fibular fracture relative to the ankle joint: infrasyndesmotic (type A), transsyndesmotic (type B), and suprasyndesmotic (type C). This simple system can predict the presence of ligament injury and joint instability, thus playing a role in determining the type of treatment [8].

The next most important classification of ankle fractures is the Lauge-Hansen classification, based on the position of the foot and the direction of the injuring force. This classification consists of four types, which are further divided into subtypes. Each stage represents a step in the magnitude of the force and encompasses the injuries of the previous stages: clockwise for the right foot and counterclockwise for the left. Many aspects of both classifications can be complemented, finding important analogies between them, so that supination-adduction fractures correspond by mechanism of action and morphological findings to Weber A, supination-external rotation and pronation-abduction to Weber B and those that involve pronation-external rotation to Weber C [8].

Although several mechanisms have been described that cause syndesmotic injuries, including pronation-abduction, pronation-eversion, supination-eversion, pure external rotation, supination-abduction, and dorsiflexion, the currently accepted mechanism of injury is that of an ankle subjected to an external rotation moment with the foot in a dorsiflexed and pronated position. This position of the talus widens the mortise, placing the syndesmosis in a stress position that would be maximized by external rotation of the foot. Athletes with planovalgus alignment are more likely to have this condition. This proposed mechanism of injury is based on biomechanical models analyzed in the laboratory. Hopkinson et al. conducted a retrospective review of 15 cases, suggesting that a severe inversion sprain, causing significant rotation of the talus within the mortise, can damage the syndesmotic ligaments [9,10]. On the other hand, biomechanical studies show that plantar hyperflexion can cause injury to the deltoid ligament. Damage to this medial structure would aggravate any syndesmosis injury.

Clinical Diagnosis of Ankle Injuries

A positive diagnosis of this traumatic condition is based on a history of trauma, clinical presentation, and additional tests. Patients present to the emergency department with pain and functional impairment in the affected limb. Upon examination, an increase in volume above the joint is observed, associated with the presence of hematomas and ecchymosis. If a fracture is present, crepitus and abnormal mobility are detected. Clinical tests that aid in the diagnosis of patients with tibiofibular syndesmosis injuries include: [11-13].

- **Compression Test:** This consists of applying compression between the tibia and fibula at mid-thigh. If pain is present in the distal tibiofibular syndesmosis, the test is positive.
- **Cotton Test:** This consists of applying compression to the heel and performing medial to lateral stress movements. The presence of pain, displacement greater than 3 mm, and a click indicates a positive result.
- **Fibular translation Test:** Anteroposterior translation of the fibula is performed. The presence of pain indicates an injury to the tibiofibular syndesmosis.
- **External Rotation Stress Test:** External rotation of the foot is performed, and if pain is present in the anterior tibiofibular joint, the test is positive. This is considered the most specific test of all. Plain radiography, as an accurate diagnostic method, offers possibilities for treatment and prognosis. It allows for the exclusion of other fractures and the search for signs of damage to the syndesmosis. Three projections are used: anteroposterior, profile, and mortise. The mortise projection is made with the ray perpendicular to the ankle joint and with the leg in 15 internal

How to cite this article: Lázaro Martín Martínez E, Jaciel García P, Leonardo Martínez A, Ramón Delgado C, Alejandro Gómez S, et al. Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique. Ortho & Rheum Open Access J. 2025; 25(2): 556164.
DOI: 10.19080/OROAJ.2025.25.556164

rotations. It provides a pure anteroposterior image of the distal syndesmosis.

Major criteria for syndesmosis diastasis:

1. the medial-clear space between the external aspect of the medial malleolus and the medial aspect of the talus, which should not exceed 2-4 mm;

2. the tibiofibular clear space, which should be less than 6 mm, or less than 44% of the width of the fibula. Alteration of this space is of great value in the diagnosis of syndesmosis injury;

3. the absolute amount and percentage of tibiofibular overlap is usually greater than 6 mm, or greater than 24% of the fibular width, and in the mortise, projection is greater than 1 mm; comparative radiographs can sometimes clarify doubts. In summary, the accepted criteria for diastasis are: increased medial clear space, decreased tibiofibular overlap, and increased tibiofibular clear space. [14-16] Stress radiographs are occasionally necessary.

Treatment of Distal Tibiofibular Syndesmosis Injuries

Although plain radiography has reported low sensitivity (43%) and high specificity (100%), it has an accuracy of 72% for the diagnosis of tibiofibular syndesmosis rupture. Computed tomography can rule out the presence of fractures and avulsions and better assess the tibiofibular diastasis [17-19]. Partial ruptures can be treated conservatively (immobilization for 4–6 weeks and subsequent rehabilitation). However, injuries with severe diastasis can lead to chronic pain, osteoarthritis, heterotopic ossification, and instability, which is why they should be treated surgically [20-22]. Traditionally, syndesmotic injuries have been treated with reduction and fixation with 1 or 2 screws placed above the ankle joint [23]. The fibula is anatomically positioned posterolateral to the tibia in the sagittal plane; when performing the reduction, the clamp should be placed on the exact axis of the ankle, passing through the two malleoli, 20-30° in an anteroposterior direction. However, despite this, we often fail to achieve an anatomical reduction of the syndesmosis, as the anatomical landmarks and intraoperative radiographs do not allow for precise analysis.

There is considerable controversy regarding screw placement, the number of cortices, the material, and whether to remove them, with no studies offering a conclusive answer to these questions. Open reduction using a more anterior approach that allows visualization of the anterior reduction of the syndesmosis has proven to be a more accurate technique. Miller describes a 16% malreduction rate with this method [24]; Sagi compared open versus closed reduction, obtaining non-anatomic reduction rates of 15% and 44%, respectively [25]. Placement at 2 cm allows for a reduction with less widening than at 3.5 cm, as described by McByde in his work [24]. According to Verim et al., placing screws suprasyndesmally 40 mm from the joint line achieves less stress-free fixation, and they recommend this construction [26]. Regarding the size and number of cortices, there is also no consensus. Four-cortex fixation provides more rigid designs with a higher risk of screw breakage [27,28].

The time limit for screw removal is usually set at three months after placement. If the screw is not removed and fails to break on its own, it can cause ongoing painful symptoms. Classically, rigid fixation with transindesmotic screws is accepted as the standard in cases of severe diastasis, as recommended by the AO group. However, these screws frequently loosen or fail. Criticism is also raised about the potential need for a second surgery to remove them, adding to this increased morbidity due to the long period of immobilization and lack of support to protect the screw. An alternative is biodegradable screws, which are still under investigation. Cases of osteolysis, rupture, and loosening before complete healing have been reported, in addition to difficulty in extracting them in cases of infection [29-31].

Other Possibilities for Surgical Treatment and Stabilization

Currently, a new technique for distal tibiofibular joint fixation, the TightRope method, is being used. This is a dynamic fixation method that has demonstrated advantages over rigid fixation. This implant functions as a tension band whose objective is to provide stability to the tibio-fibular syndesmosis in the presence or absence of ankle fractures. The implant is a device consisting of two metal buttons (10 x 3.5 x 1.5 mm microplates) and a No. 5 suture passed twice through the buttonholes, forming a quadruple mechanism. It is nonabsorbable, inert, and is provided as an assembled system placed within a cannula and a pusher to slide it into its anchoring position. Figure 1. The implant is left until complete healing, and removal is usually not necessary. The strength and flexibility of the system allow for early support because cyclic loading does not increase the risk of device rupture.

The system has obvious advantages over the use of AO screws, including:

i. Maintains the physiological micromotion of the syndesmosis.

ii. Allows for strong, anatomical, and flexible fixation.

iii. No need to remove the system.

iv. Eliminates complications from screw breakage.

v. Allows for early support and return to sports and work.

vi. Simple lateral insertion technique with no learning curve required.

vii. Useful in cases of late diastasis due to screw breakage or removal.

viii. Useful in Maisonneuve fractures using double tension bands.

ix. Useful in patients with osteoporosis [32]

How to cite this article: Lázaro Martín Martínez E, Jaciel García P, Leonardo Martínez A, Ramón Delgado C, Alejandro Gómez S, et al. Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique. Ortho & Rheum Open Access J. 2025; 25(2): 556164.
DOI: 10.19080/OROAJ.2025.25.556164

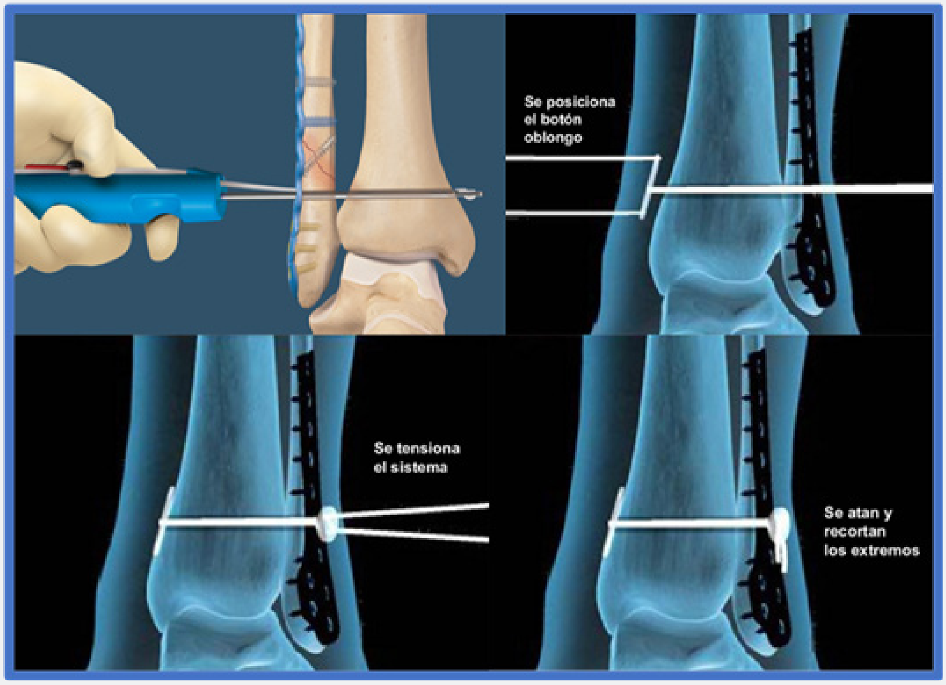

Figure 1: Original technique and instrument for the TightRope method.

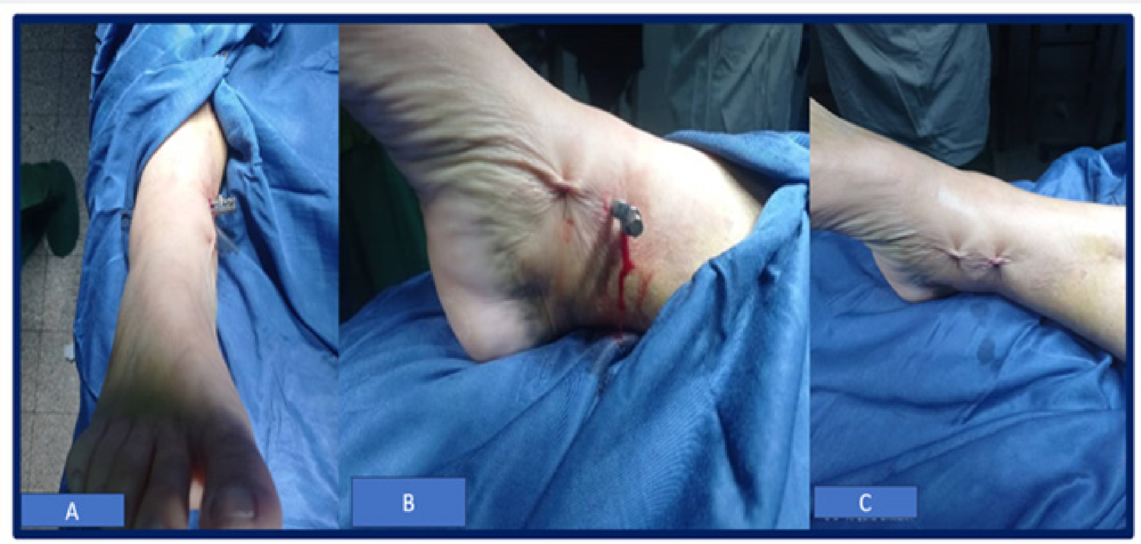

Figure 2: Modifications to the surgical technique, usefulness of minimally invasive access.

A- Passing the first cannula

B- Passing the second cannula

C- Operation complete.

Indications for the Tight Rope Method

- Absolute indication are Weber type C fractures, which are more than 3.5 centimeters above the joint line and are associated with a rupture of the deltoid ligament. - When syndesmosis fixation is required secondary to a traumatic rupture without or with fracture, usually with Weber type B and C fractures.

How to cite this article: Lázaro Martín Martínez E, Jaciel García P, Leonardo Martínez A, Ramón Delgado C, Alejandro Gómez S, et al. Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique. Ortho & Rheum Open Access J. 2025; 25(2): 556164.
DOI: 10.19080/OROAJ.2025.25.556164

- If instability persists in the syndesmosis even after performing rigid bimalleolar fixation.

The reduction is maintained manually or with a clamp while the implant is installed. Tornetta et al. have shown that excessive compression is not possible when the reduction is performed anatomically [33]. Modifications to the TightRope Technique Manual reduction of the syndesmosis is performed, and the stabilizers are placed in a minimally invasive manner. The lower limb is prepared conventionally, using a pneumatic tourniquet. A lateral drill approach is performed two centimeters proximal to the ankle joint, maintaining stability and reduction under fluoroscopic control, in the direction of the tibia up to its internal cortex, with a posteromedial tilt of approximately 25° on the lateral view or image. This is done to create a bone tunnel where a cannula is introduced (Figure 2), through which the implant is passed. The medial button is placed with a minimal incision, and the suture is passed through one of the holes. This is done again to create the second hole for the button. After placement, traction is applied to the lateral sutures, and the suture ends are tied under maintained pressure and controlled reduction in slight plantar flexion (Figure 3). The lower limb is protected with a posterior splint or cast boot in a neutral position. Recently, studies have been published consisting of a systematic review and meta-analysis comparing dynamic with static fixation [34,35].

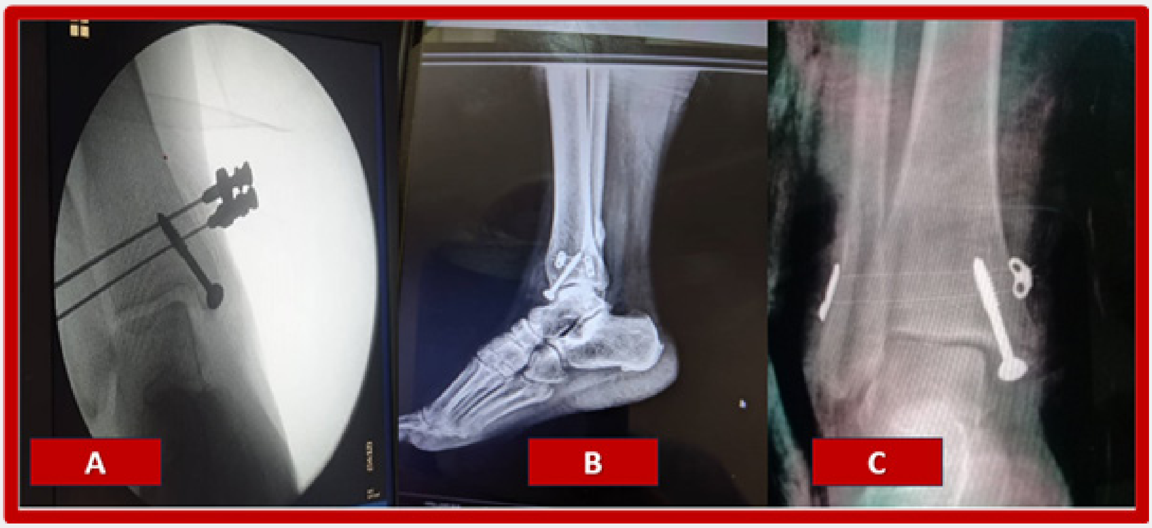

Figure 3: Radiological image of the modified technique.

A - Pre-reduction X-ray with cannulas in place.

B - Lateral X-ray with the band in place.

C - AP X-ray with the bands in place and taut, showing the reduction of the syndesmosis.

Conclusion

Isolated syndesmosis injuries may appear uncommon, but they are perhaps underdiagnosed injuries whose true incidence is unknown. Rigid screw fixation has its advantages and disadvantages, like any technique. Although the need for a second reoperation and the high possibility of late diastasis can be improved by dynamic fixation using the TightRope method, the possibility of using this method with minor modifications allows the service to have an advantage that ultimately benefits the patient.

References

1. Alemán-Navarro CM, Cegarra-Navarro MF, Redondo-Carazo MV, Martínez-Molina N, González-Alvarado GA, et al. (2018) Complicaciones de las fracturas de tobillo: manejo y hallazgos en imagen. SERAM 31(10): 2161.
2. Corte-Real N, Caetano J (2021) Inestabilidad del tobillo y la sindesmosis: consensos y controversias. EFORT Open Rev [Internet]. Junio de 6(6): 420-431.
3. Hagemeijer NC, Elghazy MA, Waryasz G, Guss D, DiGiovanni CW, et al. (2021) La inestabilidad sindesmotica del plano coronal artroscopico ha sido sobrediagnosticada. Cirugía de rodilla Traumatología deportiva Artrosc 29(1): 310-323.
4. Xie W, Lu H, Quan Y, Liu Y, Fu Z, Zhang D, et al. (2021) Análisis morfologico de fracturas del maleolar posterior con fragmento impactado intraarticular en tomografía computarizada. J. Orthop Traumatol 22(1): 52.
5. Castro-Guerrero DE, Rosas-Medina JA (2019) Inestabilidad residual de tobillo en pacientes con lesion de la sindesmosis sin fractura tratados con tornillos situacionales. Acta Ortop Mex 33(5): 292-296.
6. Lepojärvi S, Pakarinen H, Savola O, Haapea M, Sequeiros RB, Niinimäki J (2018) La traduccion posterior del peroné puede indicar reduccion defectuosa: estudio de TC de variacion normal en tobillos no lesionados. J Orthop Trauma 28(4): 205-209.

How to cite this article: Lázaro Martín Martínez E, Jaciel García P, Leonardo Martínez A, Ramón Delgado C, Alejandro Gómez S, et al. Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique. Ortho & Rheum Open Access J. 2025; 25(2): 556164.
DOI: 10.19080/OROAJ.2025.25.556164

7. Ryan C Scheer, Jared M Newman, Jack J Zhou, Alvin J Oommen, Qais Naziri, et al. (2020) Epidemiología de la fractura de tobillo en los Estados Unidos: tendencias relacionadas con el paciente y mecanismos de lesion. J. Pie Tobillo Cirug 59(3): 479-483.

8. Nielson JH, Sallis JG, Potter HG, Helfet DL, Lorich DG (2015) Correlacion de los desgarros de la membrana interosea al nivel de la fractura del peroné. J Orthop Trauma 18: 68-74.

9. Van Dijk CN, Longo UG, Loppini M, Florio P, Maltese L, et al. (2018) Classification and diagnosis of acute isolated syndesmotic injuries: ESSKA-AFAS consensus and guidelines. Knee Surg Sports Traumatol Arthrosc 24(4): 1200-1216.

10. Williams GN, Jones MH, Amendola A (2018) Esguinces de tobillo sindesmoticos en atletas. Soy J Sports Med 35(7): 1197-1207.

11. Pogliacomi F, Filippo M de, Casalini D, Longhi A, Tacci F, et al. (2021) Lesiones sindesmoticas agudas en fracturas de tobillo: del diagnostico al tratamiento y conceptos actuales. Mundo J Orthop 12(5): 270-291.

12. Spennacchio P, Seil R, Gathen M, Cucchi D (2021) Diagnostico de inestabilidad de lesiones sindesmoticas ligamentosas: una perspectiva biomecánica. Clin Biomech (Bristol, Avon) 84: 105312.

13. Tourné Y, Molinier F, Andrieu M, Porta J, Barbier G (2019) Diagnostico y tratamiento de las lesiones de la sindesmosis tibiofibular. Orthop Traumatol Surg Res 105(8S): S275-S286.

14. Van Dijk CN, Longo UG, Loppini M, Florio P, Maltese L, et al. (2018) Clasificacion y diagnostico de lesiones sindesmoticas agudas aisladas: consenso y directrices de ESSKA-AFAS. Rodilla Cirugía Deportiva Traumatol Arthrosc 24(4): 1200-1216.

15. Yu GS, Lin YB, Xiong GS, Xu HB, Liu YY (2019) Diagnóstico y tratamiento de las lesiones de la sindesmosis del tobillo con lesion de la membrana interosea asociada: una revision del concepto actual. Int Orthop 43(11): 2539-2547.

16. White T, Bugler K (2020) Fracturas de tobillo. En: Tornetta P, Ricci WM, Ostrum RF, McQueen MM, McKee MD, Court Brown CM. Fracturas de Rockwood y Green en adultos. 9ed. Filadelfia: Wolter Kluwer.

17. Gifford PB, Lutz M (2015) La línea tibiofibular: una característica anatomica para diagnosticar la malposicion de la sindesmosis. Pie Tobillo Int 35(11): 1181-1186.

18. Sharif B, Welck M, Saifuddin A (2020) MRI of the distal tibiofibular joint. Skeletal Radiol 49(1): 1-17.

19. Rudloff MI (2022) Fractures of the lower extremities. En: Azar FM, Beaty JH. Campbell's Operative Orthopaedics. 14ed. Philadelphia: Elsevier p: 2812-2838.

20. Vopat ML, Vopat BG, Lubberts B, DiGiovanni CW (2017) Tendencias actuales en el diagnóstico y manejo de la lesion sindesmotica. Curr Rev Musculoesquelético Med 10(1): 94-103.

21. Schnetzke M, Vetter SY, Beisemann N, Swartman B, Grützner PA, Franke J (2018) Manejo de lesiones sindesmoticas: ¿Cuál es la evidencia? Mundo J Orthop 7(11): 718-725.

22. Switaj PJ, Mendoza M, Kadakia AR (2019) Lesiones agudas y cronicas de la sindesmosis. Medicina Deportiva Clin 34(4): 643-677.

23. Rammelt S, Obruba P (2017) Una actualizacion sobre la evaluacion y el tratamiento de las lesiones sindesmoticas. Eur J Trauma Cirugía Emergente 41(6): 601-614.

24. Miller AN, Carroll EA, Parker RJ, Boraiah S, Helfet DL, et al. (2018) Visualizacion directa para la estabilizacion sindesmotica de fracturas de tobillo. Pie Tobillo Int 30: 419-426.

25. Sagi HC, Shah AR, Sanders RW (2019) La consecuencia funcional de la mala reduccion de la articulacion sindesmotica en un seguimiento mínimo de 2 años. J Orthop Trauma 26(7): 439-443.

26. Verim O, Er MS, Altinel L, Tasgetiren S (2019) Evaluacion biomecánica de la posicion del tornillo sindesmotico: un análisis de elementos finitos. J Orthop Trauma 28(4): 210-215.

27. Stufkens SA, van den Bekerom MP, Doornberg JN, van Dijk CN, Kloen P (2018) Tratamiento basado en la evidencia de las fracturas de maisonneuve. Cirugía del tobillo del pie J 50(1): 62-67.

28. Stuart K, Panchbhavi VK (2011) The fate of syndesmotic screws. Foot Ankle Int 32(5): S219-S25.

29. Bafna KR, Jordan R, Yatsonsky D, Dick S, Liu J, Ebraheim NA (2020) Revision de la fijacion con tornillos de sindesmosis. Especificaciones del pie y el tobillo 13(2): 138-143.

30. Huang CT, Huang PJ, Lu CC, Shih CL, Cheng YM, et al. (2022) Cambios en la sindesmosis antes y después de la extraccion del tornillo sindesmotico: un estudio radiográfico retrospectivo. Medicina (Kaunas) 58(3): 445.

31. Mercan N, Yildirim A, Dere Y (2022) Análisis biomecánico de los métodos de fijacion de lesiones de la sindesmosis tibioperonea: un análisis de elementos finitos. Cirugía de tobillo y pie J 62(1): P107-P114.

32. Xu K, Zhang J, Zhang P, Liang Y, Hu JL, Wang X, et al. (2021) Comparacion de boton de sutura versus tornillo sindesmotico en el tratamiento de la lesion de la sindesmosis tibioperonea distal: un metanálisis. Cirugía de tobillo y pie J 60(3): P555-P566.

33. Xu Y, Kang R, Li M, Li Z, Ma T, et al. (2022) La eficacia clínica de la fijacion con boton de sutura y la fijacion con tornillos transindesmoticos en el tratamiento de la fractura de tobillo combinada con la lesion de la sindesmosis tibioperonea distal: un estudio retrospectivo. Cirugía de tobillo y pie J 61(1): 143-148.

34. Xie L, Xie H, Wang J, Chen C, Zhang C, Chen H, et al. (2018) Comparacion de la fijacion con botones de sutura y la fijacion con tornillos sindesmoticos en el tratamiento de la lesion de la sindesmosis tibiofibular distal: una revision sistemática y un metanálisis. Cirugía Interna J Surg 60: 120-31.

35. Voight ML, Norman C, Wilk KE, Lucas M, Wolfe C (2024) Manejo de esguinces de tobillo mediante el procedimiento quirúrgico de la cuerda floja: un enfoque novedoso para un rápido retorno al juego. Int J Deportes Física y Termodinámica 19(5): 513-521.

How to cite this article: Lázaro Martín Martínez E, Jaciel García P, Leonardo Martínez A, Ramón Delgado C, Alejandro Gómez S, et al. Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique. Ortho & Rheum Open Access J. 2025; 25(2): 556164. DOI: 10.19080/OROAJ.2025.25.556164

How to cite this article: Lázaro Martín Martínez E, Jaciel García P, Leonardo Martínez A, Ramón Delgado C, Alejandro Gómez S, et al. Distal Tibiofibular Syndesmosis Injuries. Tightrope Method and Modifications to the Technique. Ortho & Rheum Open Access J. 2025; 25(2): 556164.
DOI: 10.19080/OROAJ.2025.25.556164