Syndesmosis TightRope® Implant

Scientific Update

Positive scientific support for the Syndesmosis TightRope implant continues to grow with more than 28 published articles. The TightRope implant for syndesmosis repair has been implanted for over 20 years and there are numerous reports of early return to activity and less morbidity. The technique also eliminates the need for second surgery screw removal.[1,2]

SCIENTIFIC ARTICLES HIGHLIGHTING THE BENEFITS OF THE SYNDESMOSIS TIGHTROPE IMPLANT:

Effectiveness of the TightRope® fixation in treating ankle syndesmosis injuries: a critically appraised topic.

Street SB, Rawlins M, Miller J

- Grade A evidence exists to support the use of Syndesmosis TightRope fixation in place of a metallic screw following ankle syndesmosis injury.
- Syndesmosis TightRope implant allows normal motion of the fibula in relation to the talus and tibia, leading to reduced complications due to late diastasis.
- Potential for decreased complications and an expedited timeframe for return to normal activities when compared to syndesmotic screw fixation.

J Sport Rehabil. 2021;30(4):676-679. doi:10.1123/jsr.2020-0265

TightRope versus screw fixation of the tibiofibular syndesmosis: a long-term CT evaluation of maintenance of reduction.

Schneider P, Thoren J, Cushnie D, Del Balso C, Tieszer C, Sanders D

- Superior maintenance of reduction with suture-button fixation
- No routine implant removal required

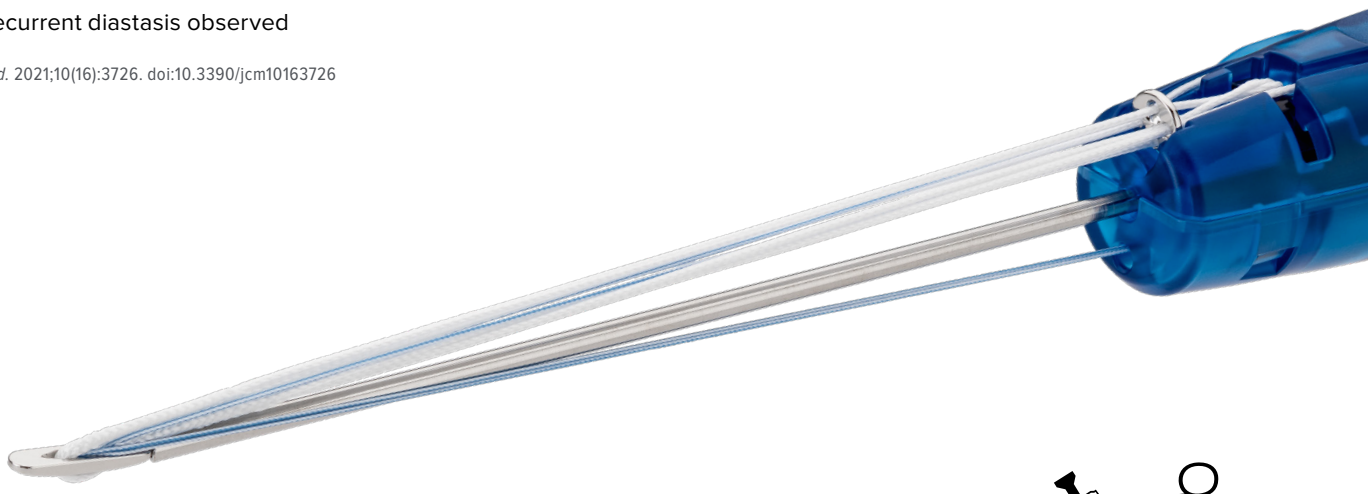
Orthop Procs. 2021;103-B(SUPP_3):56-56. doi:10.1302/1358-992X.2021.3.056

The impact of suture button removal in syndesmosis fixation.

Kim J, Kwon M, Day J, Seilern und Aspang J, Shim J, Cho J

- Removal at ~1 year relieved symptoms without loss of reduction
- No recurrent diastasis observed

J Clin Med. 2021;10(16):3726. doi:10.3390/jcm10163726



Arthrex®

Dynamic fixation versus static screw fixation for syndesmosis injuries in pronation external rotation ankle fractures: a retrospective case control study.

Lim CM, Choi SW, Kim BS, Lee SJ, Kang HS

› Similar clinical scores

› Fewer complications and no hardware failures with dynamic fixation

MMalays Orthop J. 2023;17(3):48-58. doi: https://doi.org/10.5704/MOJ.2311.008

Differences in gait analysis and clinical outcome after dynamic fixation or screw fixation in acute syndesmosis tear: a prospective randomized pilot study.

Mick P, Doll J, Müller M, Schmidmaier G, Renkawitz T, Campos S, Wolf SI, Tsitlakidis S

› TightRope group showed better ankle moments and plantar flexion

› Supports physiologic motion with dynamic fixation

Arch Orthop Trauma Surg. 2024;144(9):4355-4363. doi:10.1007/s00402-024-05535-8

Management of high ankle sprains utilizing the TightRope surgical procedure - a novel approach for a rapid return to play.

Voight ML, Norman C, Wilk KE, Lucas M, Wolfe C

› Accelerated rehab and early weight-bearing

› Return to sport in <2 months reported

Int J Sports Phys Ther. 2024;19(5):513-521. doi:10.26603/001c.116862

Comparison of the outcomes of syndesmotic ankle fractures treated with dynamic fixation versus static fixation versus fibular nail: a meta-analysis and systematic review.

Cho T, Waters A, Senthilkumar S, Shendge S, Liu J

› Dynamic fixation showed higher OMAS scores at 1 and 2 years

› Lower reoperation rates compared to screws

Ann Jt. 2024;9:36. doi:10.21037/aoj-24-14

A modified dynamic fixation technique for acute syndesmotic injuries.

Bouaicha W, Jlidi M, Sbaihi S, Gharbi MH, Mallek K, Jaziri S, Daas S

› Reinforces biomechanical equivalence of suture-button constructs

› Emphasizes reduced complications and faster recovery

Foot Ankle Orthop. 2024;9(1):24730114241232979. doi:10.1177/24730114241232979

Comparison between suture-button technique with syndesmotic repair and screw fixation technique for complete ankle syndesmotic injury: biomechanical cadaveric study.

Lee HS, Kim SH, Young KW, Kim WJ, Cheon DI, Won SH, Lee SH, Choi SJ, Lee YK

› Comparable torsional strength to screws

› Allows physiologic motion of the syndesmosis

Clin Orthop Surg. 2025;17(2):324-330. doi:10.4055/cios24338

Clinical and radiological outcomes of screw fixation and suture-button technique in syndesmosis injuries with isolated lateral malleolus fractures.

Bayrak HÇ, Karagöz B, Gök O

› Higher AOFAS and OMAS scores in suture-button group

› Reduced clinically relevant complications

J Foot Ankle Surg. Published online November 12, 2025. doi:10.1053/j.jfas.2025.11.007

Dynamic stabilization of syndesmosis injuries reduces complications and reoperations as compared with screw fixation: a meta-analysis of randomized controlled trials.

Grassi A, Samuelsson K, D'Hooghe P, Romagnoli M, Mosca M, Zaffagnini S, Amendola A

› Reduced number of complications and improved clinical outcomes compared to static screw fixation, especially malreduction and clinical instability or diastasis, at a follow-up of 2 years.

› Lower risk of reoperation was found with dynamic fixation as compared to static fixation with permanent screws.

Am J Sports Med. 2020;48(4):1000-1013. doi:10.1177/0363546519849909

Better outcome for suture button compared with single syndesmotic screw for syndesmosis injury: five-year results of a randomized controlled trial.

Ræder BW, Figved W, Madsen JE, Frihagen F, Jacobsen SB, Andersen MR

› Five years after syndesmotic injury treated with either suture button or syndesmotic screw, better AOFAS and OMA scores, and a lower incidence of ankle osteoarthritis were found in the suture button group

› Significantly smaller difference in anterior tibiofibular distance between the injured and non-injured ankles for the suture button fixation group

Bone Joint J. 2020;102-B(2):212-219. doi:10.1302/0301-620X.102B2.BJJ-2019-0692.R2

Improved reduction of the tibiofibular syndesmosis with TightRope compared to screw fixation: results of a randomized controlled study.

Sanders D, Schneider P, Taylor M, Tieszer C, Lawendy AR; Canadian Orthopaedic Trauma Society

› The Syndesmosis TightRope implant for syndesmosis injuries is validated for traumatologists in one of the largest and most comprehensive randomized clinical trials to date.

› The surgeons involved were all trained traumatologists at 11 different trauma centers with 103 patients followed for 1 year.

› The superiority of the Syndesmosis TightRope implant over syndesmosis screws was proven, with results showing better reduction, improved daily activities, and quicker return to work with no surgery needed for routine hardware removal.

J Orthop Trauma. 2019;33(11):531-537. doi:10.1097/BOT.0000000000001559.

Suture button versus syndesmotic screw for syndesmosis injuries: a meta-analysis of randomized controlled trials.

Shimozono Y, Hurley ET, Myerson CL, Murawski CD, Kennedy JG

- The Syndesmosis TightRope implant technique results in improved functional outcomes and lower rates of broken implant and joint malreduction as compared with the syndesmotic screw technique.
- The primary advantage is that the Syndesmosis TightRope implant allows for anatomic healing of the syndesmosis and avoids implant removal.
- The Syndesmosis TightRope implant technique warrants a grade A recommendation in the treatment of syndesmosis injuries.

Am J Sports Med. 2019;47(11):2764–2771. doi:10.1177/0363546518804804

Randomized trial comparing suture button with single syndesmotic screw for syndesmosis injury. Repair of horizontal meniscus tears: a systematic review.

Andersen MR, Frihagen F, Hellund JC, Madsen JE, Figved W

- Therapeutic level 1 evidence demonstrates that the Syndesmosis TightRope implant is superior to 1 quadricortical syndesmotic screw over a 2-year follow-up of 97 patients.
- Patients treated with a Syndesmosis TightRope implant had higher AOFAS scores, OMA scores, and EQ-5D Index scores as well as lower (better) VAS scores for pain during walking and pain during rest.
- The TightRope implant is a better alternative than 1 quadricortical screw in the treatment of syndesmotic injuries because it provides better anatomical restoration and superior clinical results.

J Bone Joint Surg Am. 2018;100(1):2-12. doi:10.2106/JBJS.16.01011

Lower complication rate and faster return to sports in patients with acute syndesmotic rupture treated with a new knotless suture button device.

Colcuc C, Blank M, Stein T, Raimann F, Weber-Spickschen S, Fischer S, Hoffmann R

- The Syndesmosis TightRope implant had a 5-week faster return to sport and a 2-week faster return to work compared to syndesmosis screws.
- The Syndesmosis TightRope implant also had a lower complication rate and a lower second surgery rate.
- Both the faster return to sport and the lower complication rate were statistically significant in the knotless suture button vs screw fixation group.

Knee Surg Sports Traumatol Arthrosc. 2018;26(10):3156-3164. doi:10.1007/s00167-017-4820-3

A prospective randomized study comparing TightRope and syndesmotic screw fixation for accuracy and maintenance of syndesmotic reduction assessed with bilateral computed tomography.

Kortekangas T, Savola O, Flinkkilä T, Lepojärvi S, Nortunen S, Ohtonen P, Katisko J, Pakarinen H

- 43 “PER Weber C” fractures were randomized to 1 TightRope implant vs 1 syndesmotic screw.
- The Syndesmosis TightRope implant had lower malreduction and reoperation rates compared to syndesmotic screws.

Injury. 2015;46(6):1119-1126. doi:10.1016/j.injury.2015.02.004

Ankle syndesmosis repair and rehabilitation in professional rugby league players: a case series report.

Latham AJ, Goodwin PC, Stirling B, Budgen A

- Ankle syndesmosis surgery via a double TightRope implant repair followed by the accelerated rehabilitation protocol is as safe as the traditional procedures.
- Accelerated rehabilitation protocol promotes early weight-bearing resulting in an effective and quick route to return to sport for professional rugby league players.
- A period of 2 months from surgery to return to sport is possible compared to 3 to 6 months post screw fixation, which is very encouraging for the professional athlete population.

BMJ Open Sport Exerc Med. 2017;3(1):e000175. doi:10.1136bmjsem-2016-000175

Suture button fixation versus syndesmotic screws in supination-external rotation type 4 injuries: a cost-effectiveness analysis.

Neary KC, Mormino MA, Wang H

- The Syndesmosis TightRope implant was a dominant treatment strategy, because patients spent on average $1482 less compared to syndesmotic screws.
- The Syndesmosis TightRope implant patients had a higher quality of life by 0.058 QALYs over an 8-year time period.
- Second surgery cost for screw removal was $14,768 per case.
- Syndesmotic screw fixation required 2 extra clinic visits and $389 in ankle X-rays.
- Syndesmotic screw fixation had lower quality-of-life measurements.

Am J Sports Med. 2017;45(1):210-217. doi:10.1177/0363546516664713

A prospective randomized multicenter trial comparing clinical outcomes of patients treated surgically with a static or dynamic implant for acute ankle syndesmosis rupture.

Laflamme M, Belzile EL, Bédard L, van den Bekerom MP, Glazebrook M, Pelet S

- The TightRope implant gives better clinical and radiographic outcomes without breakage, loss of reduction, or reoperation.
- The TightRope implant outperformed screws clinically with 0% failure, 0% loss of reduction, and higher AOFAS scores.

J Orthop Trauma. 2015;29(5):216-223. doi:10.1097/BOT.0000000000000245

The effect of suture-button fixation on simulated syndesmotic malreduction: a cadaveric study.

Westermann RW, Rungprai C, Goetz JE, Femino J, Amendola A, Phisitkul P

- With deliberate malreduction, the TightRope implant fixation results in less post-fixation displacement compared with screw fixation.
- The TightRope implant appears to take advantage of distal tibiofibular anatomy in achieving improved reduction.
- The TightRope implant's ability to allow for natural correction of deliberate malreduction was greatest with posterior off-axis clamping.

J Bone Joint Surg Am. 2014;96(20):1732-1738. doi:10.2106/JBJS.N.00198

Injuries to the ankle syndesmosis.

Van Heest TJ, Lafferty PM

- The so-called gold-standard syndesmotic screw fixation is being brought increasingly into question as new fixation techniques emerge.
- Suture-button fixation represents a promising alternative.

J Bone Joint Surg Am. 2014;96(7):603-613. doi:10.2106/JBJS.M.00094

Fixation of ankle syndesmotic injuries: comparison of TightRope fixation and syndesmotic screw fixation for accuracy of syndesmotic reduction.

Naqvi GA, Cunningham P, Lynch B, Galvin R, Awan N

- The TightRope implant had 0% syndesmosis malreduction compared to 22% malreduction with screws.
- The TightRope implant was significantly better at maintaining the reduction, even after a mean duration of 30 months after surgery.
- The TightRope implant provides a more accurate method of syndesmotic stabilization and obviates the need for a second procedure for routine removal.

Am J Sports Med. 2012;40(12):2828-2835. doi:10.1177/0363546512461480

Does the Arthrex TightRope® provide maintenance of the distal tibiofibular syndesmosis? A 2-year follow-up of 64 TightRopes in 37 patients.

Qamar F, Kadakia A, Venkateswaran B

- The TightRope implant was advantageous because it rarely required removal, allowed for physiologic motion of the syndesmosis, and resulted in early return to weight-bearing.
- The TightRope implant provides long-term stability (24 months), confirmed by radiographic criteria and excellent AOFAS scores.

J Foot Ankle Surg. 2013;52(5):563-567. doi:10.1053/j.jfas.2013.04.013

An anatomical way of treating ankle syndesmotic injuries.

Qamar F, Kadakia A, Venkateswaran B

- The TightRope implant allows for accelerated rehabilitation and improved outcome.
- No failures of fixation despite the early postoperative weight-bearing.
- Advantageous in older, obese patients, or patients who cannot comply with a non–weight-bearing regimen that is required with screw fixation.
- Cost-effective because it does not require retrieval with a second surgery.

J Foot Ankle Surg. 2011;50(6):762-765. doi:10.1053/j.jfas.2011.07.001

Outcomes of suture button repair of the distal tibiofibular syndesmosis.

Degroot H, Al-Omari AA, El Ghazaly SA

- The suture button device represents a viable alternative to screw fixation for syndesmosis injuries.
- Because of the ease-of-use of the device and the ability to allow full weight-bearing without concerns about implant breakage, we feel that suture button fixation is superior to conventional metallic screws.

Foot Ankle Int. 2011;32(3):250-256. doi:10.3113/FAI.2011.0250

Syndesmosis and lateral ankle sprains in the National Football League.

Osbahr DC, Drakos MC, O'Loughlin PF, Lyman S, Barnes RP, Kennedy JG, Warren RF

› 70% of team physicians recommend hardware removal before return to sport

› No need for removal and second surgery with the TightRope implant

› No need for removal in cases with obvious diastasis; return to play was 9-16 weeks

Orthopedics. 2013;36(11):e1378-1384. doi:10.3928/01477447-20131021-18

The functional consequence of syndesmotic joint malreduction at a minimum 2-year follow-up.

Sagi HC, Shah AR, Sanders RW

› Studies have shown that between 24%-39% of syndesmoses are malreduced.

› 1 mm loss of syndesmotic reduction results in 42% increase in joint contact pressure.

J Orthop Trauma. 2012;26(7):439-443. doi:10.1097/BOT.0b013e31822a526a

Acute distal tibiofibular syndesmosis injury: a systematic review of suture-button versus syndesmotic screw repair.

Schepers T

› Rate of implant removal is lower than in the syndesmotic screw group.

› The TightRope implant system has a similar outcome compared with syndesmotic screw or bolt fixation, but might lead to a quicker return to work.

Int Orthop. 2012;36(6):1199-1206. doi:10.1007/s00264-012-1500-2

Suture-button versus screw fixation of the syndesmosis: a biomechanical analysis.

Klitzman R, Zhao H, Zhang LQ, Strohmeyer G, Vora A

› Rigid fixation of the syndesmosis with screw fixation may be problematic in allowing physiologic motion of the syndesmosis.

Foot Ankle Int. 2010;31(1):69-75. doi:10.3113/FAI.2010.0069

Suture-button versus screw fixation in a syndesmosis rupture model: a biomechanical comparison.

Soin SP, Knight TA, Dinah AF, Mears SC, Swierstra BA, Belkoff SM

› No difference vs syndesmotic screw in terms of overall fibular motion

› Provides similar fixation to that of a 4-cortices 3.5 mm screw

Foot Ankle Int. 2009;30(4):346-352. doi:10.3113/FAI.2009.0346.

Transosseous fixation of the distal tibiofibular syndesmosis: comparison of an interosseous suture and endobutton to traditional screw fixation in 50 cases.

Cottom JM, Hyer CF, Philbin TM, Berlet GC

› Late diastasis is avoided since the device remains in place while ligaments continue to heal

› Advantageous in older, obese, or polytrauma patients that may have difficulty remaining non–weight-bearing postoperatively

J Foot Ankle Surg. 2009;48(6):620-630. doi:10.1053/j.jfas.2009.07.013

Walking on a tightrope: our experience in the treatment of traumatic ankle syndesmosis rupture.

McMurray D, Hornung B, Venkateswanen B, Ali Z

› TightRope implant shows favorable results when used to repair syndesmosis.

› Patients are able to be full weight-bearing sooner.

Injury Extra. 2008;39(5):182. doi:10.1016/j.injury.2007.11.354

Treatment of syndesmoses disruptions: a prospective, randomized study comparing conventional screw fixation vs TightRope® fiber wire fixation - medium term results.

Coetzee JC, Ebeling PB

› TightRope fixation gives a significantly better overall range of motion than conventional screw fixation

› Better AOFAS scores at 6, 12, and 27 months

SA Orthop J. 2009;8(1):32-37

Treatment of syndesmotic disruptions with the Arthrex Tightrope: a report of 25 cases.

Cottom JM, Hyer CF, Philbin TM, Berlet GC

› Radiographic reduction maintained

› Faster time to full weight-bearing; no second surgery

Foot Ankle Int. 2008;29(8):773-780. doi:10.3113/FAI.2008.0773

Ankle syndesmosis injuries treated with the TightRope suture-button kit.

Thornes B, McCartan D

› Rehabilitation is faster and allows the athlete or patient to return to sport or work sooner

› TightRope allows physiological micromotion, while resisting diastasis and may be more preferable than a rigid screw

Tech Foot Ankle Surg. 2006;5(1):45-53.

TightRope stabilisation of proximal and distal tibiofibular syndesmosis rupture: the floating fibula–a case report.

Pelc HJS, Carmont MR, Sutton PM, Blundell CM

› A case of simultaneous proximal and distal tibiofibular joint disruption stabilized using the TightRope construct

› Rigid fixation of the distal tibiofibular syndesmosis, would have limited operative reduction of the proximal tibiofibular syndesmosis, but the TightRope allowed for appropriate and anatomic reduction and stability of the tibiofibular syndesmosis

Injury Extra. 2009;40(1):16-18. doi:10.1016/j.injury.2008.09.016

Suture-button syndesmosis fixation: accelerated rehabilitation and improved outcomes.

Thornes B, Shannon F, Guiney AM, Hession P, Masterson E

› Better AOFAS scores at 3 and 12 months

› Return to work faster; no second surgery

Clin Orthop Relat Res. 2005;(431):207-212.

Suture-endobutton fixation of ankle tibio-fibular diastasis: a cadaver study.

Thornes B, Walsh A, Hislop M, Murray P, O'Brien M

› TightRope implant gave a significantly more consistent performance than screw fixation.

› TightRope implant would provide obvious cost savings to both the patient and health service, free up OR time, and eliminate the need for the patient to go through a second procedure.

Foot Ankle Int. 2003;24(2):142-146.doi:10.1177/107110070302400208

Repair of the tibiofibular syndesmosis with a flexible implant.

Seitz WH Jr, Bachner EJ, Abram LJ, Postak P, Polando G, Brooks DB, Greenwald AS

› Provides a more physiologic solution than rigid fixation

› Allows weight-bearing without damage to surrounding bone, while providing reliable fixation of the healing syndesmotic ligaments

J Orthop Trauma. 1991;5(1):78-82. doi:10.1097/00005131-199103000-00014

References

1. Colcuc C, Blank M, Stein T, et al. Lower complication rate and faster return to sports in patients with acute syndesmotic rupture treated with a new knotless suture button device. *Knee Surg Sports Traumatol Arthrosc.* 2018;26(10):3156-3164. doi:10.1007/s00167-017-4820-3
2. Laflamme M, Belzile EL, Bédard L, van den Bekerom MP, Glazebrook M, Pelet S. A prospective randomized multicenter trial comparing clinical outcomes of patients treated surgically with a static or dynamic implant for acute ankle syndesmosis rupture. *J Orthop Trauma.* 2015;29(5):216-223. doi:10.1097/BOT.0000000000000245