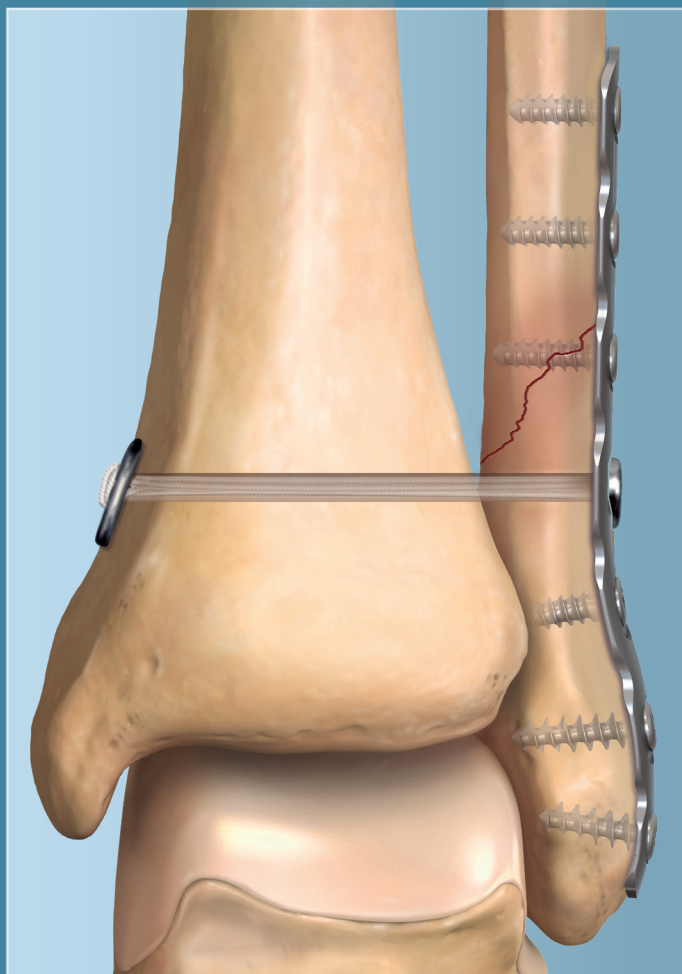


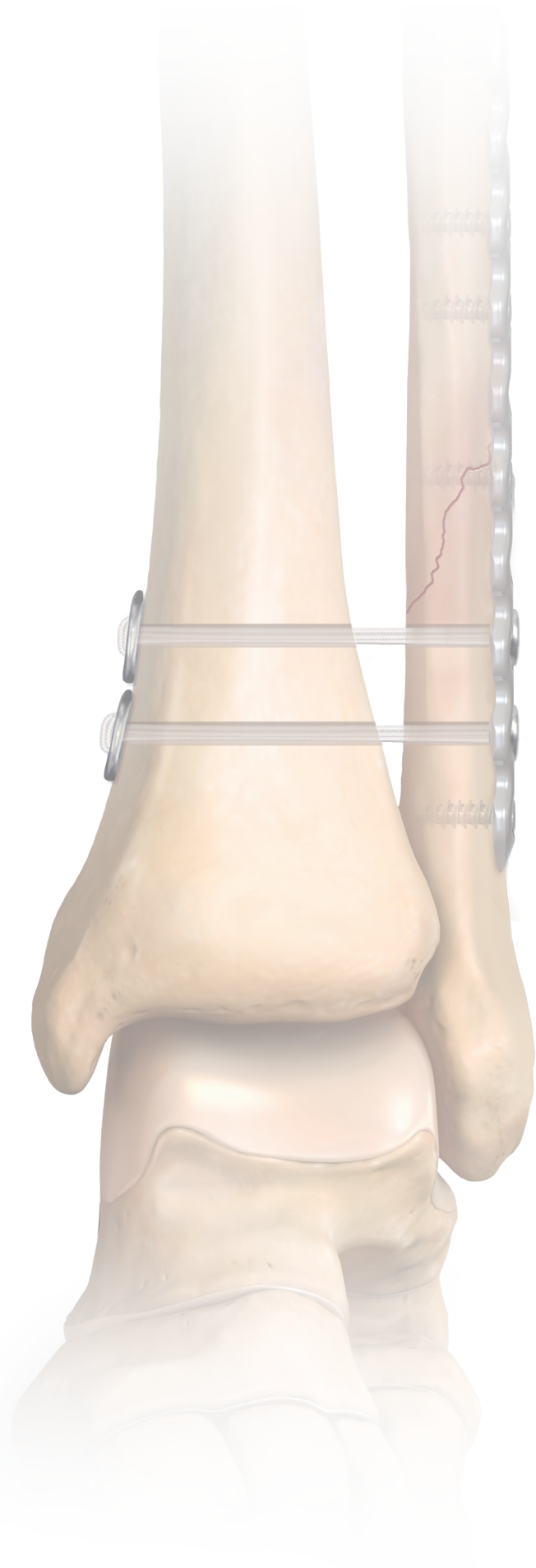


Syndesmosis TightRope® Implant System

Surgical Technique



Syndesmosis TightRope Implant System



Syndesmosis TightRope® Implant System

The Syndesmosis TightRope implant system provides fixation of syndesmosis disruptions with or without associated ankle fractures. The Syndesmosis TightRope implant system is composed of a #5 UHMWPE, that, when tensioned and secured between metallic buttons and placed against the tibia and fibula, provides physiologic stabilization of the ankle mortise. Biomechanical testing and clinical trials have shown equivalent strength and improved patient outcome with the TightRope technique.^{1,2} The Syndesmosis TightRope implant system decreases the need for a second procedure for removal, eliminates any knot prominence and may help promote quicker return to activity.² The “snowshoe” hold on cortical bone makes the TightRope suitable in osteoporotic bone where metallic screws can “cut-out.”

The modular, low-profile Ankle Fracture Management System consists of stainless steel and titanium specialty plates in unique configurations and locking screws designed for most types of ankle fractures. Plates feature nested holes for a flush TightRope implant profile, minimizing implant prominence while improving stability of the button.

Fractures in the lower two-thirds of the fibula should be anatomically fixed to ensure correct fibular length and rotation. High fibula fractures (Maisonneuve injury) can be fixed with fibular shaft ORIF and concomitant syndesmosis stabilization, based on the injury pattern. This can be done using 1 or 2 TightRope implants, depending on the severity of the syndesmosis disruption and surgeon preference.

Advantages:

- No need for routine removal
- Eliminates broken screw complications
- Achieves strong and anatomic fixation
- Simplifies lateral insertion technique
- Facilitates double TightRope implant technique for Maisonneuve fracture
- Weightbearing may be commenced earlier than with screw fixation²
- Biomechanical testing and clinical results have shown equivalent strength and improved patient outcomes^{1,2}

Indications

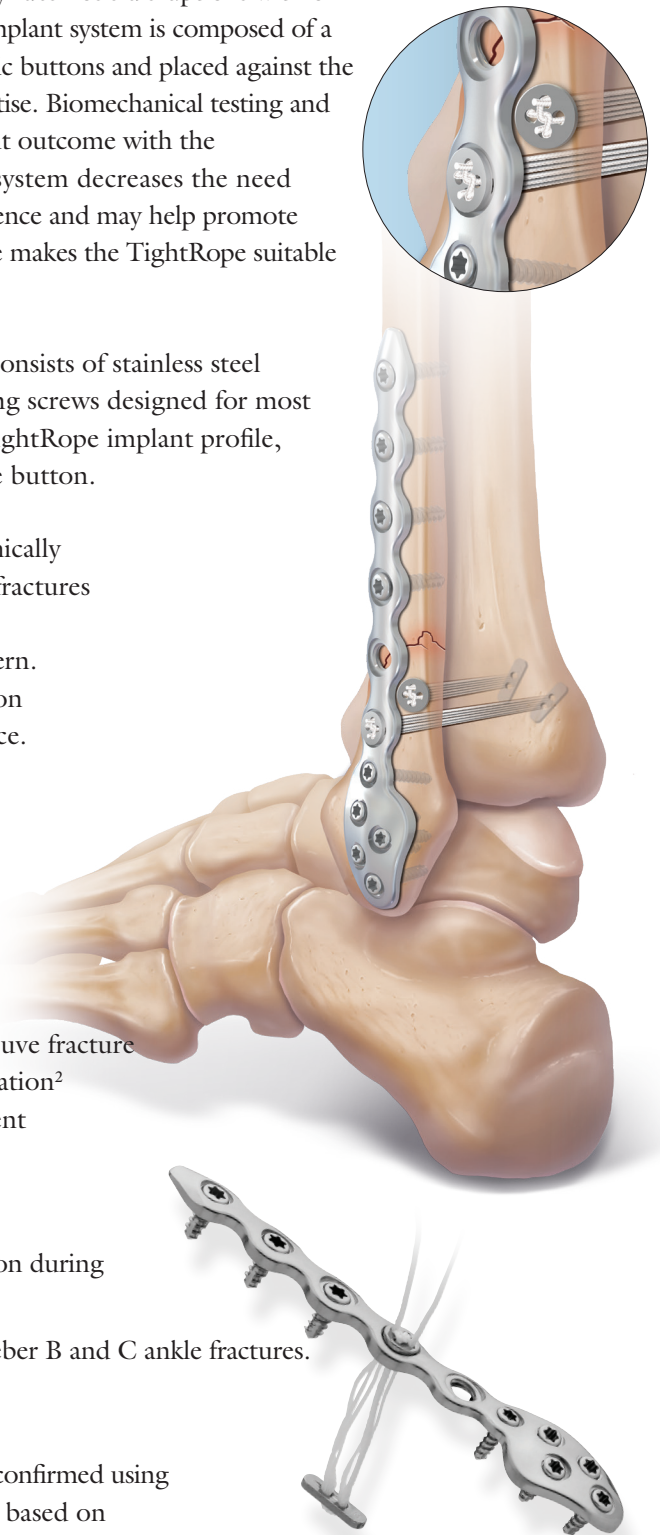
The TightRope implant is intended to provide syndesmosis fixation during the healing process following a syndesmotic trauma, commonly seen with Weber B and C ankle fractures.

Syndesmosis Reduction

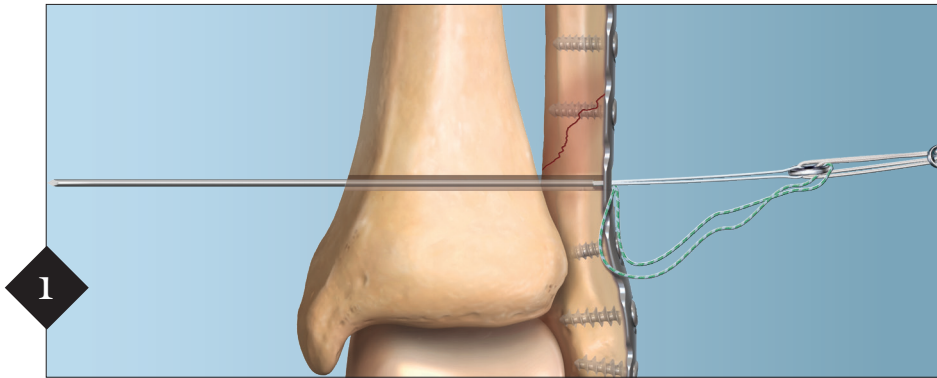
The syndesmosis should be formally reduced prior to fixation and confirmed using fluoroscopy, direct visualization during open reduction, or both based on surgeon preference and severity of injury. Internal rotation in moderate ankle plantar flexion is the usual method of reduction.

References

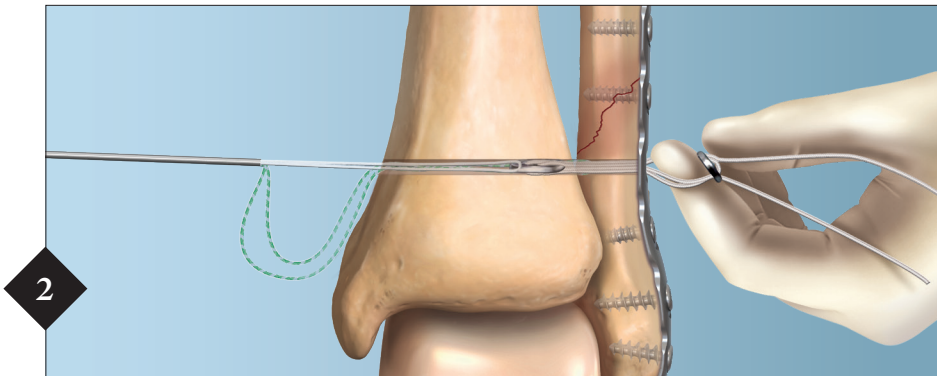
1. Arthrex Research and Development. Long-term cycling of the TightRope Syndesmosis Repair Kit and 4.5 mm Synthes cortex screw. Arthrex, Inc. Naples, FL; 2012.
2. Qamar F, Kadakia A, Venkateswaran B. An anatomical way of treating ankle syndesmotic injuries. *J Foot Ankle Surg.* 2011;50(6):762-765.



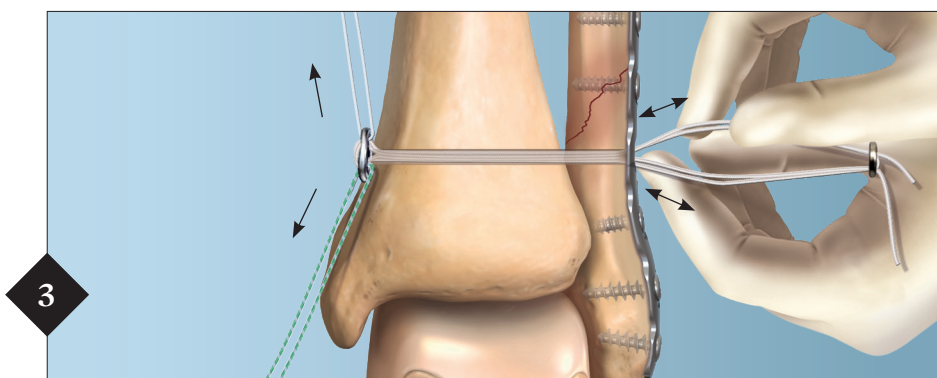
Syndesmosis TightRope® Implant System



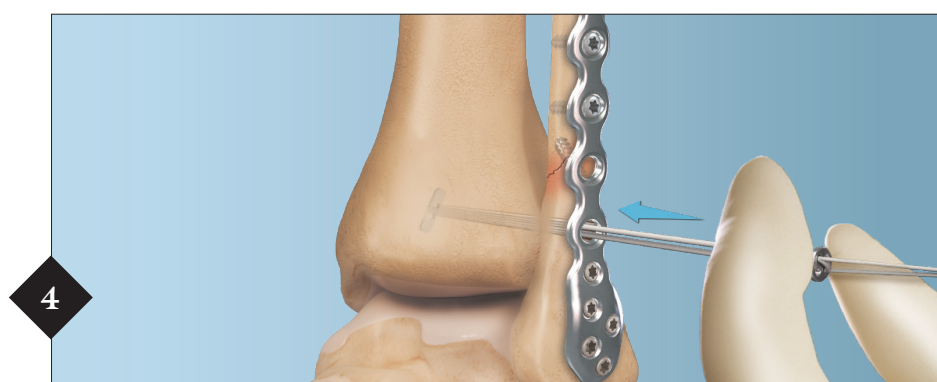
Stabilize all fractures prior to Syndesmosis TightRope implant insertion. Drill all 4 cortices approximately 1.5 cm above the ankle joint, in the transmalleolar plane (~30° anterior to the coronal plane), using the 3.7 mm drill bit. The use of a guidewire and cannulated drill bit is recommended to allow confirmation of accurate positioning prior to drilling; however, a solid drill bit is also provided. The needle and pull-through sutures are passed along the drill hole and out the intact medial skin.



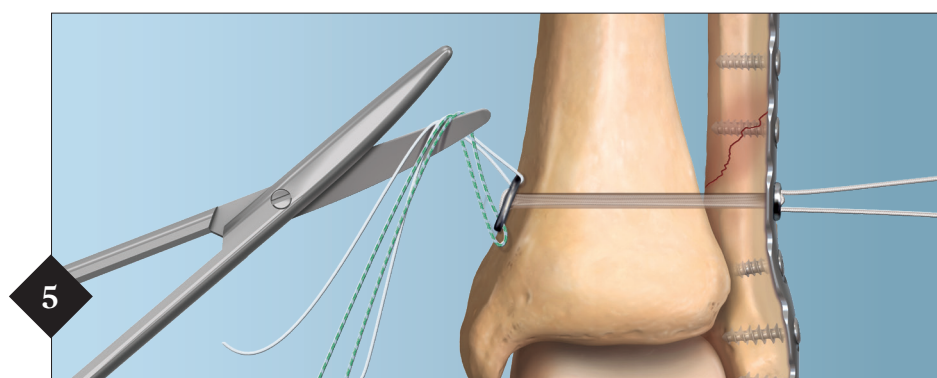
The white 2-0 FiberWire® pull-through suture advances the leading oblong button, until it just exits the medial tibial cortex. (Note: The green/white 2-0 FiberWire suture has been added to facilitate placement of the medial button during step 3. Do not tension the green/white suture while passing the button from the fibula through the tibia.) It should remain slack as it passes through the drill hole.



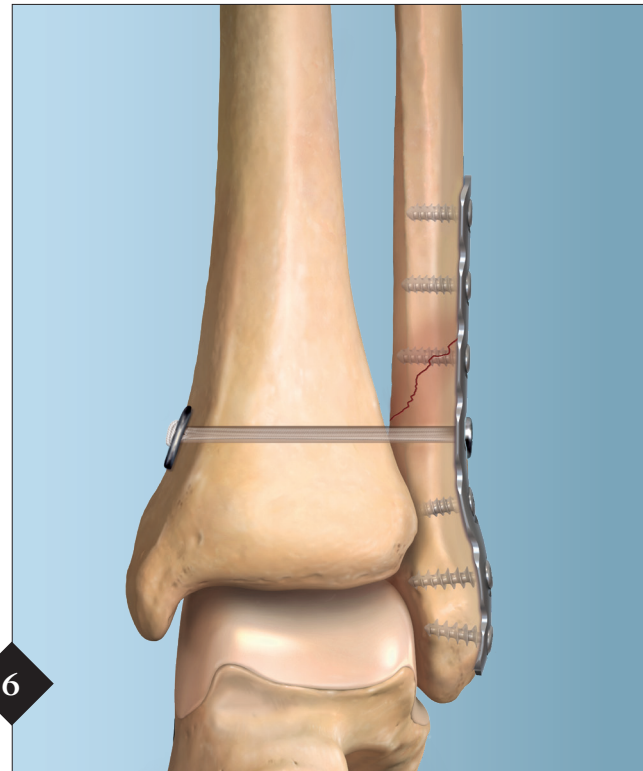
Place upward tension on the white pull-through suture, while placing downward tension on the green/white suture. The button should seat easily along the medial cortex. Confirm placement using a C-arm. (Note: Toggling the 2 pairs of #5 FiberWire sutures on the lateral side will also aid in seating the medial button.)



Grasp the center sutures of the round button before tensioning. Slide the round button down to the plate or bone.



Cut and remove the medial pull-through sutures. Cut the white lateral sutures flush with the round button.

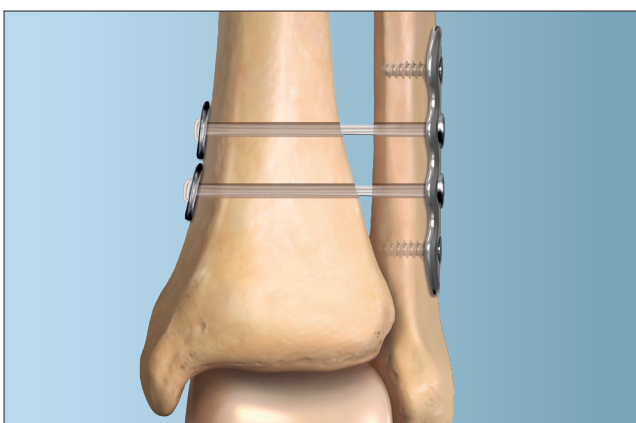


Syndesmosis TightRope® fixation complete.

Syndesmosis TightRope Buttress Plate Implant

The Syndesmosis TightRope buttress plate (SBT implant) features a 4-hole, contoured, titanium plate, to be used as a “buttress” for ankle syndesmotom repairs with or without ankle fracture. The plate has 2 inner holes that custom fit the round button of the TightRope implant and 2 outer holes that accept two 3.5 mm x 14 mm nonlocking screws. The implant comes with everything required to complete the syndesmotom fixation.

The 3.5 mm screws are placed in the proximal and distal holes of the buttress plate. A Syndesmosis TightRope is then placed either in the third hole or in both central holes (inset), if desired.



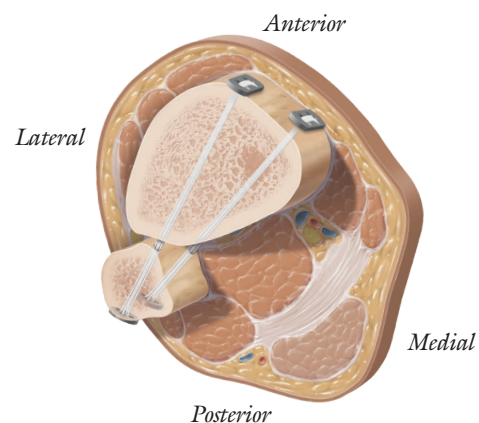
Postoperative Management

Following wound closure, immobilize the ankle in neutral dorsiflexion using a short-leg, postoperative splint. Depending on fracture fixation stability and severity of syndesmosis disruption, partial weightbearing may be permitted in a cast or walker boot between 2 to 6 weeks based on surgeon preference. Full weightbearing is typically allowed at 6 weeks, transitioning to a functional brace as tolerated.

Implant Removal

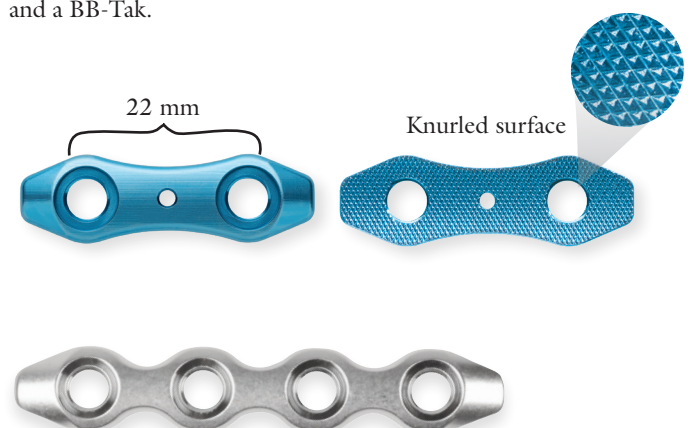
Routine removal of the TightRope® implant is not required. However, if hardware removal is necessary, using a scalpel to cut the suture over the lateral button is recommended. This facilitates using the medial button to extricate the suture strands.

Left leg: A second TightRope implant can be used if further syndesmosis stability is required. The second TightRope implant should be placed 1 cm above the first, with slight axial divergence to increase rotational stability.



Dual Syndesmosis TightRope Implant

The Dual Syndesmosis TightRope implant system with 2-hole buttress plate is designed to treat syndesmotom injuries of the ankle. It features a uniquely designed syndesmosis plate with 22 mm between the holes to disperse the force of the Syndesmosis TightRope implants over the fibula. Two titanium Knotless Syndesmosis TightRope implants are included for convenience along with the drills, guidewires, and a BB-Tak.



Ordering Information

Syndesmosis TightRope® Implant System:

Syndesmosis TightRope Implant System, titanium	AR-8926T
Syndesmosis TightRope Implant System, stainless steel	AR-8926SS

- Drill Bit, 3.7 mm
- Drill Guide, disposable
- Oblong Button, 3.5 mm x 13 mm (medial side placement)
- Round Button, 6.5 mm (lateral side placement)
- #5 UHMWPE, white
- Guidewire, 1.6 mm w/ pull-through suture, white and green/white
- Guidewire Sleeve

Dual Syndesmosis TightRope Implant System (AR-8958TDS) includes:

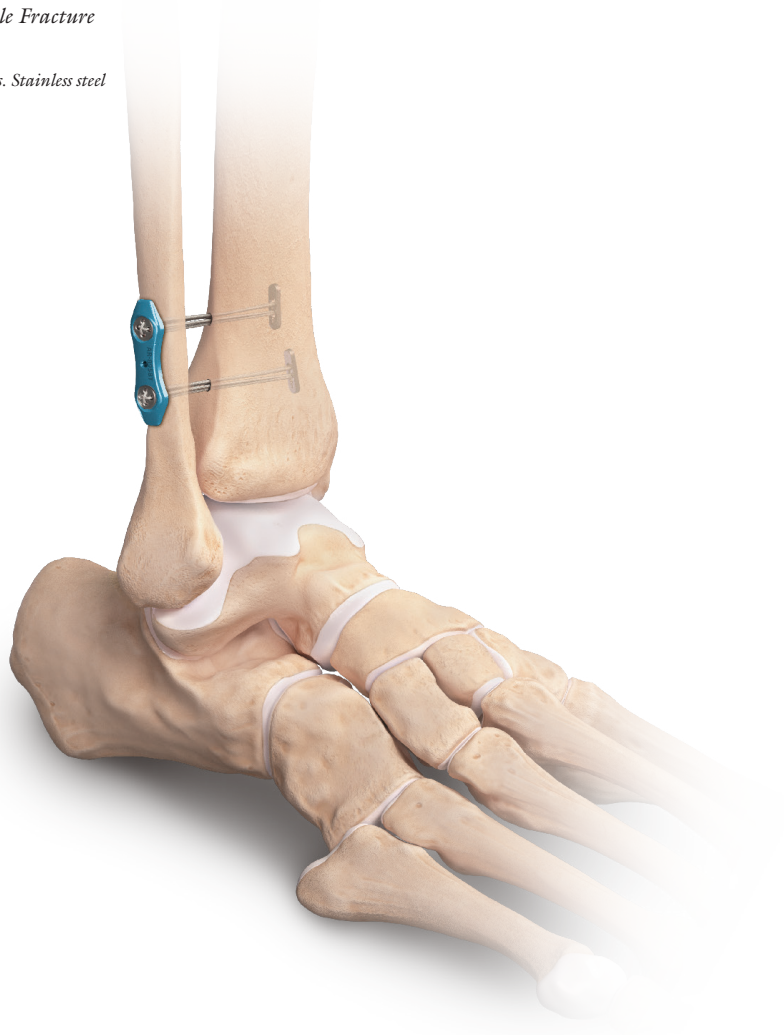
- Knotless Syndesmosis TightRope Implant System, titanium, qty. 2
- Two-Hole Plate, titanium
- BB-Tak, threaded
- Guidewire, qty. 2
- Drill Guide
- Drill Bit, cannulated, 3.7 mm
- Drill Bit, 3.7 mm
- TightRope Guidewire Sleeve

Knotless Syndesmosis Buttress Plate Kit (AR-8947DS) includes:

- SBT, 43 mm length
- LPS Screw, 3.5 mm x 14 mm, qty. 2
- Pin Tip Drill Bit/Drill Guide, 2.5 mm
- Driver T15, hexalobe
- Knotless TightRope, titanium
- Drill Bit, 3.7 mm
- Drill Bit, cannulated, 3.7 mm
- Guidewire With Trocar Tip
- Guidewire Sleeve

For information on the full list of materials, see our Ankle Fracture Management System Technique Guide, LTI-00109-EN

**Note: Titanium implant to be used with titanium plate and screws. Stainless steel implant to be used with stainless steel plates and screws.*



Ankle Fracture Management Plates

Locking Distal Fibula Plate, 4H, right	AR-8943BR-04
Locking Distal Fibula Plate, 5H, right	AR-8943BR-05
Locking Distal Fibula Plate, 6H, right	AR-8943BR-06
Locking Distal Fibula Plate, 8H, right	AR-8943BR-08
Locking Distal Fibula Plate, 4H, left	AR-8943BL-04
Locking Distal Fibula Plate, 5H, left	AR-8943BL-05
Locking Distal Fibula Plate, 6H, left	AR-8943BL-06
Locking Distal Fibula Plate, 8H, left	AR-8943BL-08
Locking Straight Plate, 4H	AR-8943C-04
Locking Straight Plate, 6H	AR-8943C-06
Locking Straight Plate, 7H	AR-8943C-07
Locking Straight Plate, 8H	AR-8943C-08
Locking Straight Plate, 10H	AR-8943C-10
Locking Straight Plate, 12H	AR-8943C-12
Locking Medial Hook Plate, 3H	AR-8943H-03
Locking Medial Hook Plate, 5H	AR-8943H-05
Locking Medial Hook Plate, 7H	AR-8943H-07
Locking Third Tubular Plate, 4H	AR-8943T-04
Locking Third Tubular Plate, 5H	AR-8943T-05
Locking Third Tubular Plate, 6H	AR-8943T-06
Locking Third Tubular Plate, 7H	AR-8943T-07
Locking Third Tubular Plate, 8H	AR-8943T-08
Locking Third Tubular Plate, 10H	AR-8943T-10
Locking Third Tubular Plate, 12H	AR-8943T-12
Locking Lateral Hook Plate, 3H	AR-8943TH-03
Locking Lateral Hook Plate, 5H	AR-8943TH-05
Locking Lateral Hook Plate, 7H	AR-8943TH-07
Nonlocking Third Tubular Plate, 6H	AR-8943TNL-06
Nonlocking Third Tubular Plate, 7H	AR-8943TNL-07
Nonlocking Third Tubular Plate, 8H	AR-8943TNL-08

Ankle Fracture Management Screw System (AR-8943C-31)

*Optional auxiliary tray	
Low-Profile Screws, stainless steel	
2.7 mm Cortical <i>Lengths: 10-60 mm (2 mm increments)</i>	AR-8827-10 to 60
2.7 mm Locking <i>Lengths: 10-60 mm (2 mm increments)</i>	AR-8827L-10 to 60
3.0 mm Cancellous <i>Lengths: 10-30 mm (2 mm increments)</i>	AR-8830-10 to 30
3.5 mm Cortical <i>Lengths: 10-60 mm (2 mm increments), 65-80 mm (5 mm increments)</i>	AR-8835-10 to 80
3.5 mm Locking <i>Lengths: 10-40 mm (2 mm increments)</i>	AR-8835L-10 to 60
4.0 mm Cancellous, fully threaded <i>Lengths: 10-50 mm (2 mm increments), 55 mm, 60 mm</i>	AR-8840-10 to 60
4.0 mm Cancellous, short thread <i>Lengths: 30-50 mm (2 mm increments), 55 mm, 60 mm</i>	AR-8840P-10 to 60
4.0 mm Cancellous, long thread <i>Lengths: 30-50 mm (2 mm increments), 55 mm, 60 mm</i>	AR-8840PL-30 to 60
4.0 Cannulated, short thread <i>Lengths: 30-50 mm (2 mm increments), 55 mm, 60 mm</i>	AR-8840C-30 to 60
4.0 mm Cannulated, long thread <i>Lengths: 30-50 mm (2 mm increments), 55 mm, 60 mm</i>	AR-8840CL-30 to 60
Other Implants and Instruments	
BB-Tak, smooth	AR-13226
BB-Tak, threaded	AR-13226T
Drill Sleeve for 2.7 mm Locking Screws	AR-8943-32
Drill Sleeve for 3.5 mm Locking Screws	AR-8963-06





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This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's directions for use. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

This technique was developed in conjunction with Brian Thornes, MD, Dublin, Ireland

View U.S. patent information at www.arthrex.com/corporate/virtual-patent-marking

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