

Lisfranc Fixation With the 2.7 mm Knotless Mini TightRope[®] Implant System

Surgical Technique



Arthrex[®] 

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Introduction

Low energy, purely ligamentous injuries of the Lisfranc joint are difficult to detect and require a high index of suspicion to identify their subtle presentation, particularly in athletes. Weightbearing radiographs, in combination with CT and MRI, may be required for accurate diagnosis; any diastasis greater than 2 mm is considered positive.

Traditional fixation methods that use screws and/or plates are effective in providing a stable construct for the Lisfranc injury. However, they may overconstrain the joint, resulting in the inability to return to preinjury levels. Additionally, rigid fixation often requires a secondary surgery for hardware removal prior to full weightbearing and has the added risk of losing reduction.

Flexible fixation devices, such as the Knotless Mini TightRope implant system, overcome the shortcomings of rigid fixation and provide surgeons with a strong,^{1,2} reproducible construct to stabilize the Lisfranc joint.

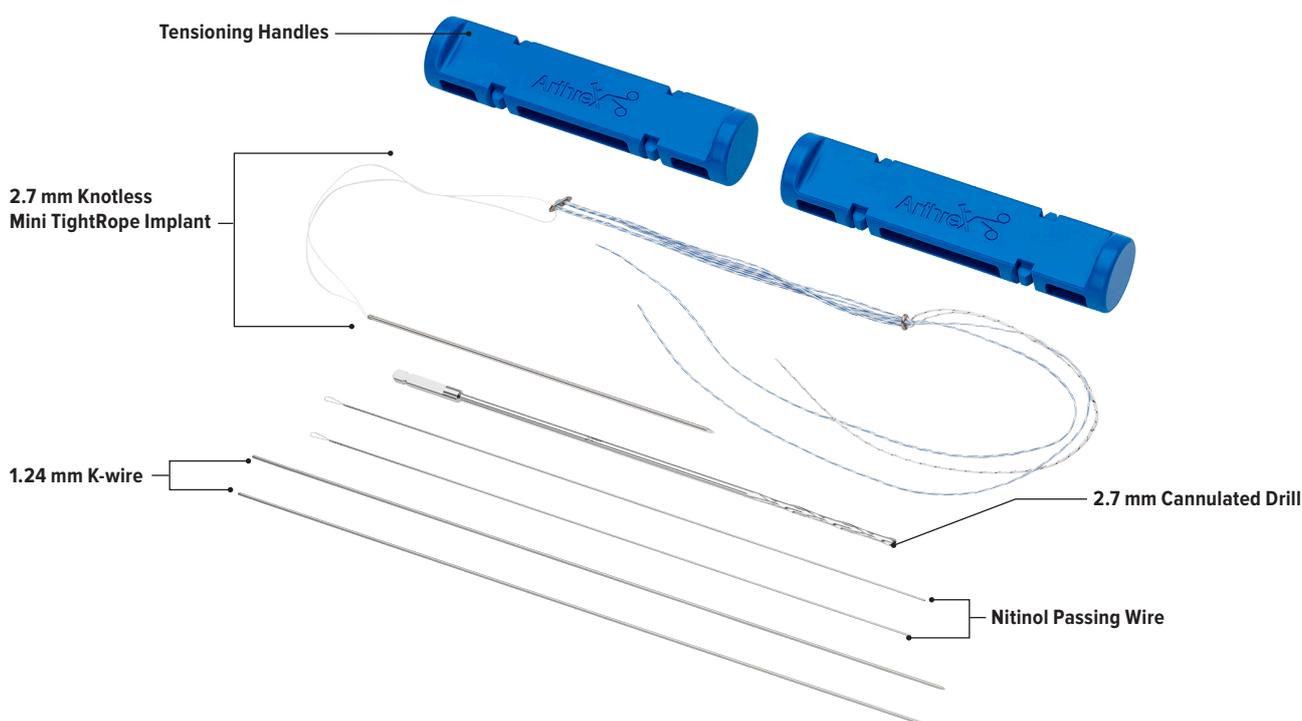
Advantages

- No secondary surgery for hardware removal prior to weightbearing and/or problems with broken screws
- No loss in reduction after screw removal
- Nonrigid anatomical reduction may function more like the natural ligament than a rigid screw
- Low profile, knotless implant fixation with patented tensionable technology
- 40% increase in mechanical strength^{1,2}
- Novel 6-strand construct

References

1. Arthrex, Inc. Data on file (APT-05278). Naples, FL; 2021.
2. Arthrex, Inc. Data on file (APT-05279). Naples, FL; 2021.

Knotless Mini TightRope Implant System





Use a 2-incision technique. Make the first incision dorsally between the 1st and 2nd metatarsal bases. The second incision should be medial, along the medial cuneiform and inferior to the tibial anterior tendon insertion. Take care to protect the neurovascular bundle, located underneath the extensor hallucis brevis (EHB).



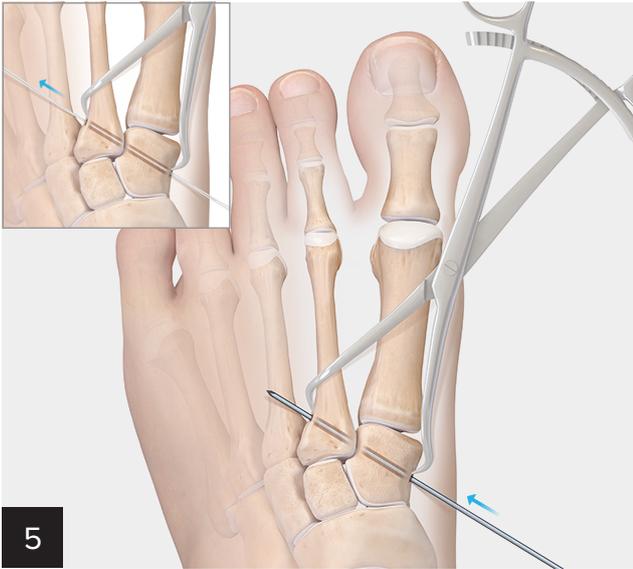
Stabilize the Lisfranc complex with the reduction clamp and compress the 2nd metatarsal base and medial cuneiform.



Starting at the dorsal lateral edge of the 2nd metatarsal base, insert the 1.24 mm K-wire. Aim plantar toward the medial cuneiform and through the interosseous ligament. The guidewire should exit inferior to the tibialis anterior tendon. Check guidewire trajectory under fluoroscopy.



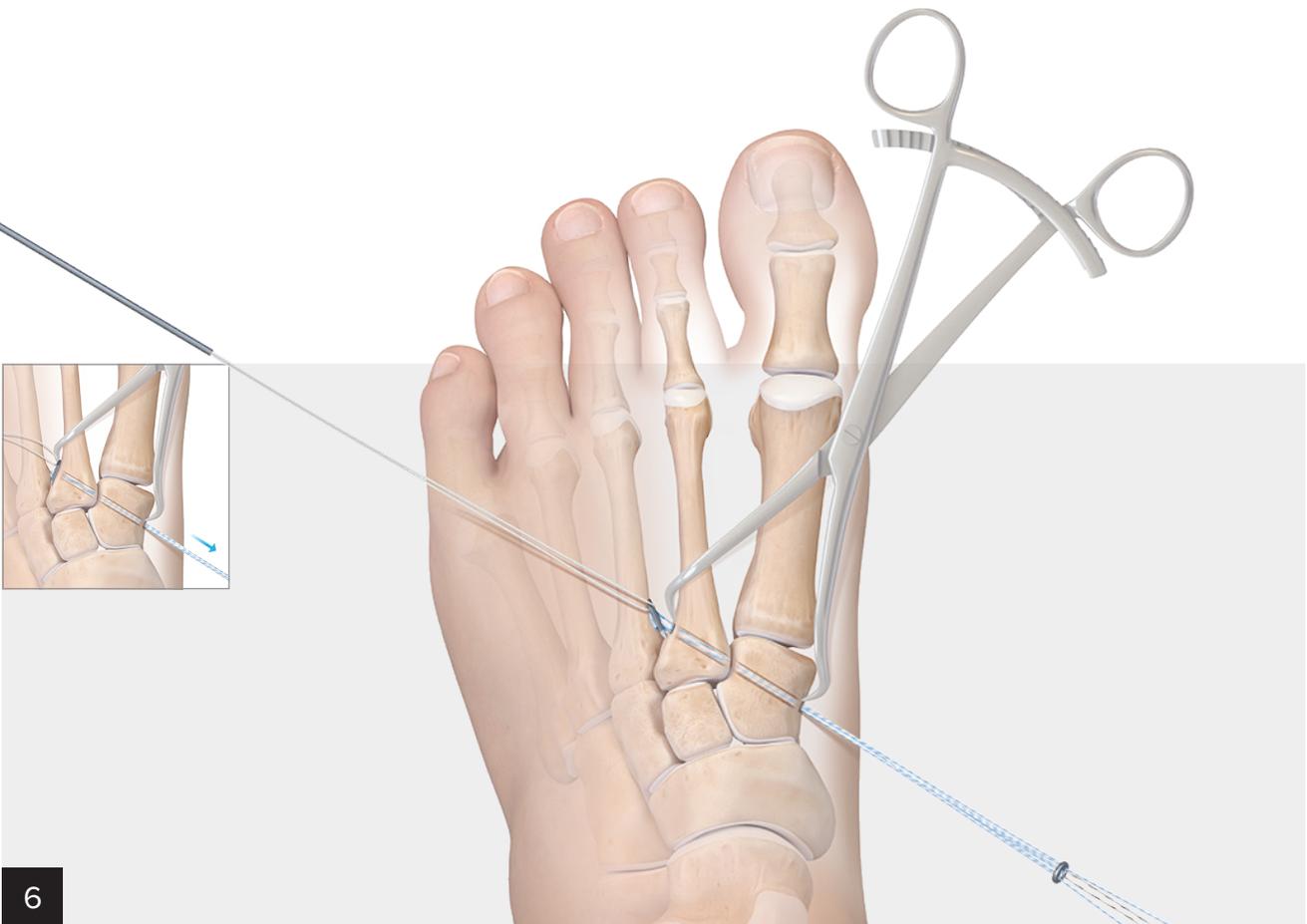
Overdrill the 1.24 mm K-wire using the 2.7 mm drill. Start at the 2nd metatarsal and exit medially through the medial cuneiform.



Pass the guidewire attached to the 2.7 mm Knotless Mini TightRope® construct retrograde from the medial cuneiform to the 2nd metatarsal base.

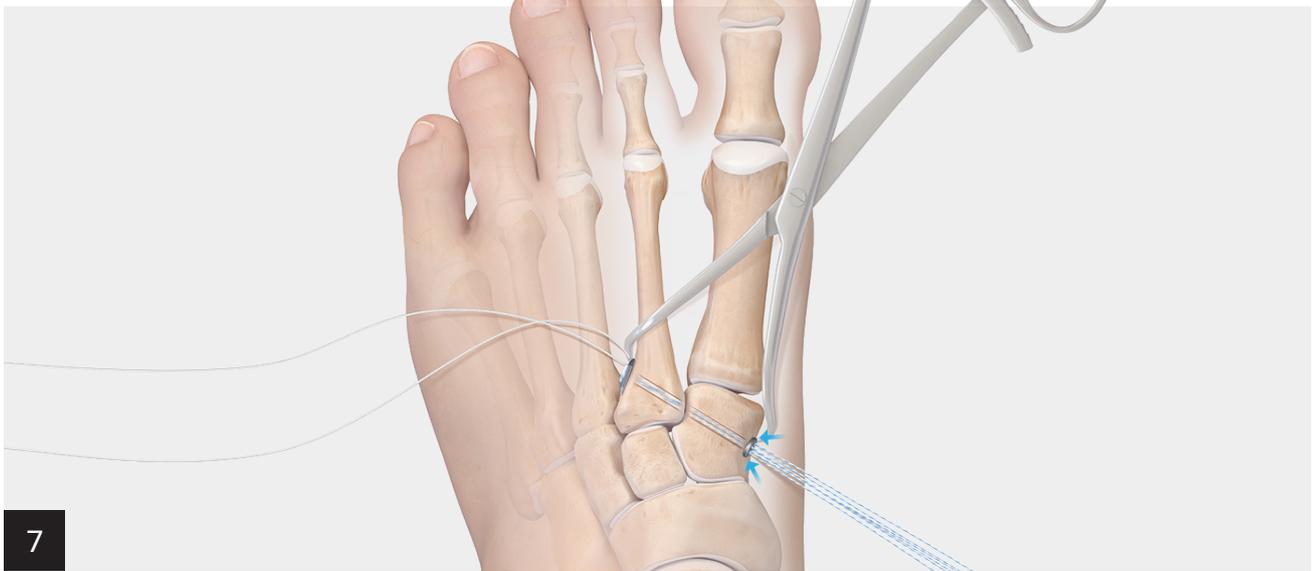
Option 1: Remove the 2.7 mm drill and 1.24 mm K-wire prior to passing the guidewire from the TightRope construct through the bone tunnel.

Option 2: Simultaneously advance the guidewire from the TightRope construct in a retrograde fashion as you pull the 2.7 mm drill out of the 2nd metatarsal base.



Continue to pull the guidewire laterally to advance the oblong button through the bone tunnel. Keep tension on both sides of the oblong button while passing it through the bone tunnel to the 2nd metatarsal base. This will ensure the button remains flat in the bone tunnel.

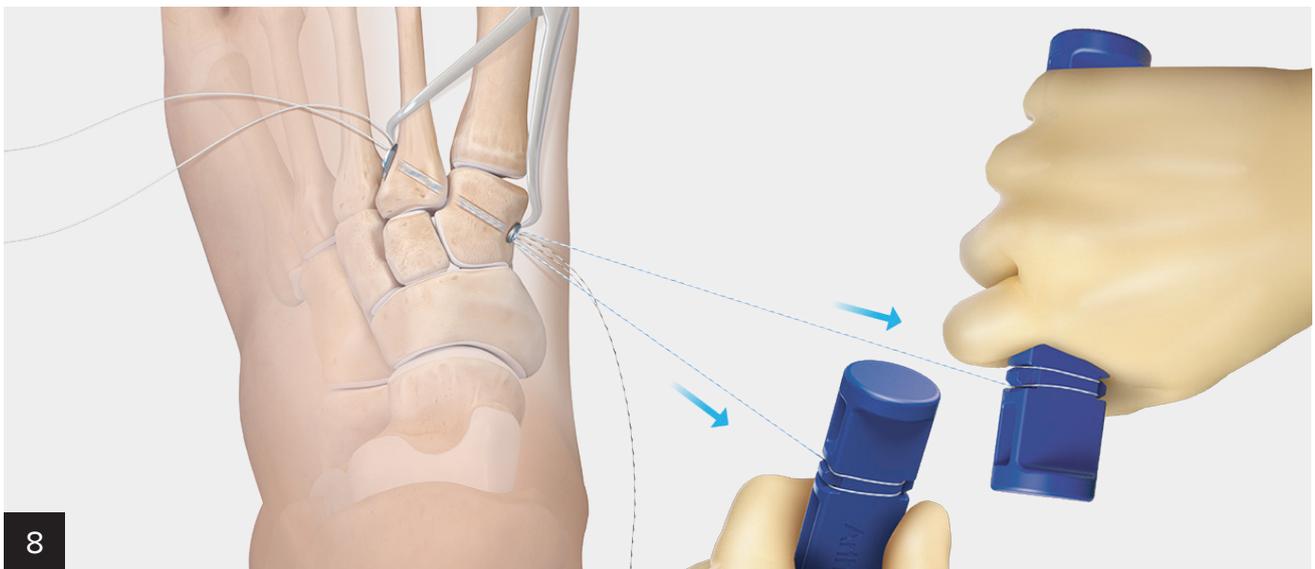
Flip the oblong button on the lateral cortex of the 2nd metatarsal and ensure it lays flat on the bone. Use forceps to reposition the button if needed.



Remove lateral slack and create preliminary tension across the Lisfranc joint by pulling the sutures medially across the bone tunnel. Take care to pull on the sutures, rather than the round button, to generate tension.

Hold all sutures in one hand while using forceps to guide the round button down the sutures until it contacts bone. This will minimize suture entanglement when completing final tensioning.

Note: Take care to avoid entrapping or irritating the tibialis anterior tendon.



Final-tension the Knotless Mini TightRope implant by pulling straight axially on the suture tails of the round button. The included tensioning handles can be used to assist.

Once desired tension is achieved, evaluate the reduction under direct visualization and fluoroscopy. Cut the safety sutures and suture tails off for the final construct.

Note: If suture entanglement occurs during tensioning, pull axially on the white/black safety sutures.



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Final fixation.

Supplemental Fixation



For low energy, purely ligamentous Lisfranc injuries with mild instability in the sagittal plane, consider adding the Lisfranc plate dorsally along with the Knotless Mini TightRope® implant system.



When intercuneiform instability is present, consider adding a 3.5 mm Mini or 4.0 mm standard Compression FT screw percutaneously from the medial cuneiform to the middle cuneiform.

Explant Information

The Knotless Mini TightRope® implant can be removed by cutting the sutures with a surgical knife or FiberWire® scissor (AR-11796).

Ordering Information

Knotless Mini TightRope Implant System, 2.7 mm

Product Description	Item Number
Knotless Mini TightRope Implant, 2.7 mm #2 Coreless Machine-Tapered Suture 5.5 mm Round Button Oblong Button, 2.6 mm TightRope Guide Pin, 1.6 mm Cannulated Drill, 2.7 mm, qty. 1 Nitinol Passing Wires, qty. 2 K-Wires, 1.24 mm, qty. 2 Tensioning Handles, qty. 2	AR-8908DS

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