

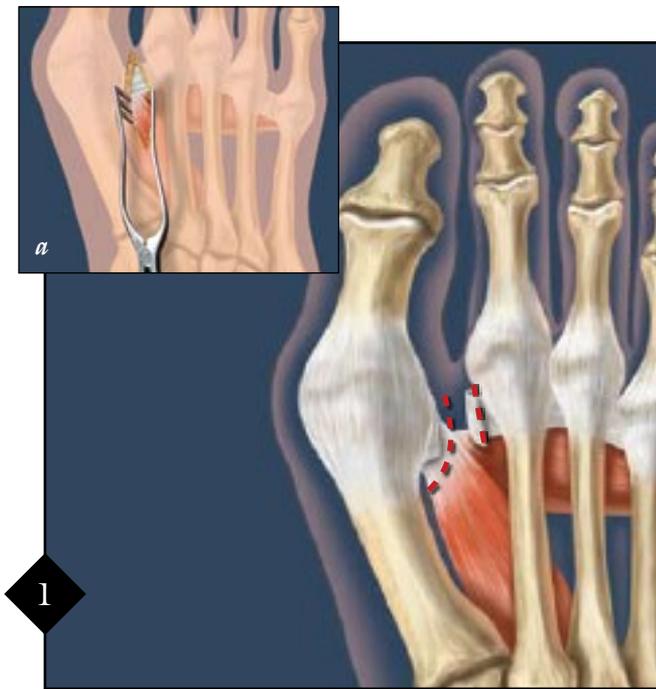


Mini TightRope® For Hallux Valgus Correction  
and Lisfranc Ligament Repair

Surgical Technique



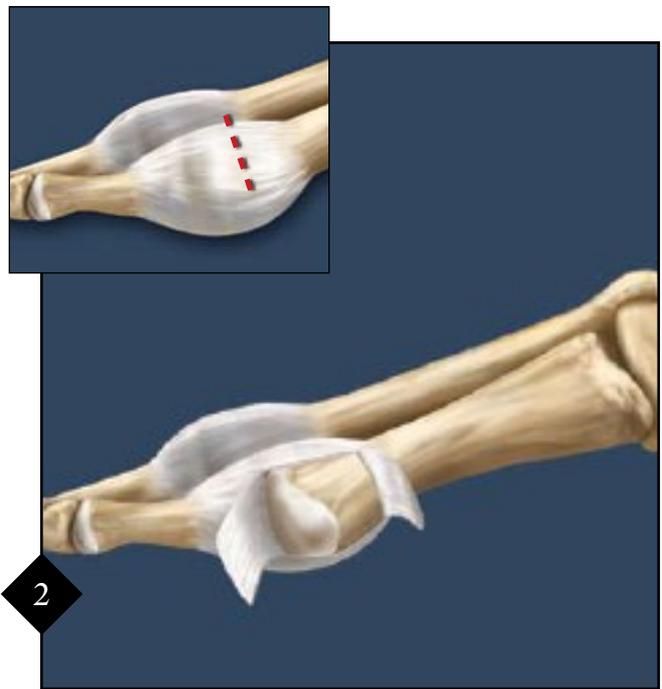
# Mini TightRope



1

To realign the fibular sesamoid, detach the adductor tendon from the base of the proximal phalanx and fibular sesamoid. Release the deep intermetatarsal ligament. If needed, free any sesamoid adhesions to the intermetatarsal ligament. Manually test the angular deformity following the release of the adductor tendon, release of the lateral capsule of the first metatarsophalangeal joint and release of the intermetatarsal ligament between the 1st and 2nd metatarsals.

For the distal approach, the incision is made between 1st and 2nd metatarsals and inner space release is performed (a).



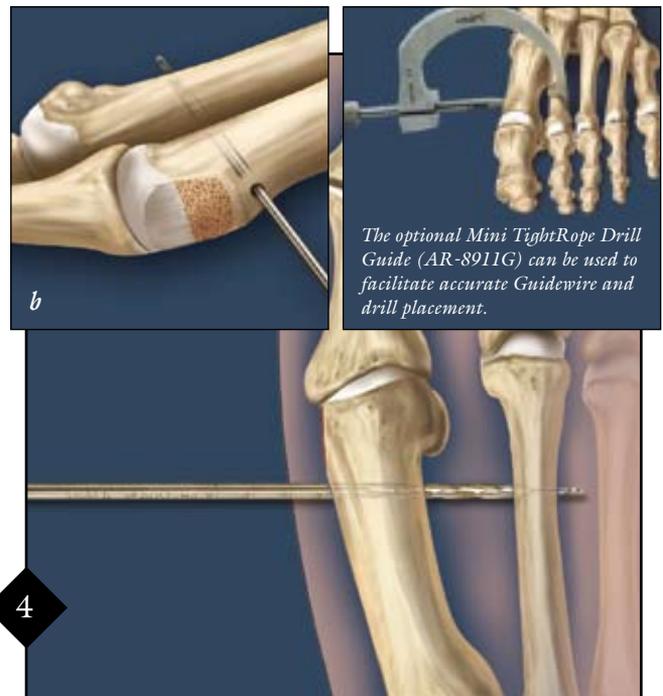
2

Make a longitudinal incision over the medial aspect of the 1st metatarsophalangeal joint, exposing the entire medial eminence.



3

Remove the medial eminence preserving the sesamoid groove on the plantar aspect of the 1st metatarsal, avoiding excessive resection of the medial eminence.

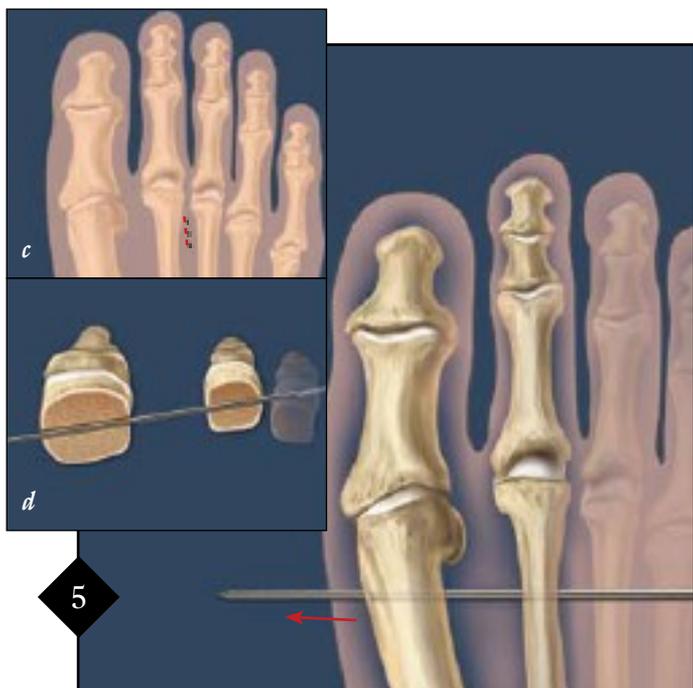


4

metatarsal should be about 2-5 mm proximal to the neck of the 2nd metatarsal head (b). *Note: Place Guidewire while visualizing 1st - 2nd metatarsal web space. A Freer elevator can direct Guidewire penetration at 2nd metatarsal midpoint.*

**Fig. 4** - Using the C-Arm for guidance, insert the 1.2 mm Guidewire across the 1st metatarsal and through the 2nd metatarsal. Start the Guidewire pilot hole just proximal to the excised medial eminence. An adjustment in plantar-to-dorsal direction may assist in the accurate placement of pin allowing the pin to engage the 2nd metatarsal in the midpoint between its dorsal and plantar borders. The entry point on the 2nd

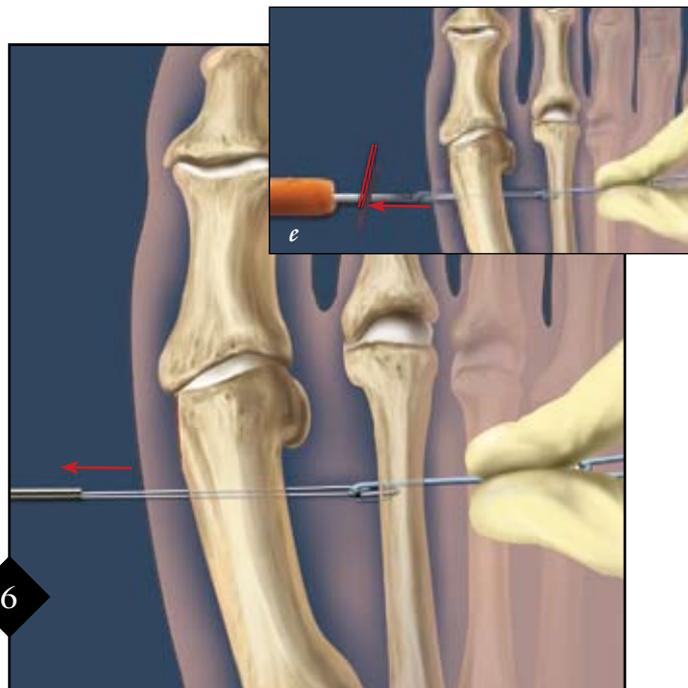
Alternatively, the 1.2 mm Guidewire can be placed from the 2nd metatarsal across and through the 1st metatarsal. This enhances the ease of accurately bisecting the 2nd metatarsal with reference to the dorsal and plantar aspects of the metatarsal. Using the 2.7 mm Cannulated Drill Bit, drill the tunnel for the Mini TightRope over the Guidewire in a medial to lateral direction. Confirm proper placement with the C-Arm.



Pass the 1.6 mm guide pin with pull-through suture (attached to the Mini TightRope) from lateral (2nd metatarsal) to medial (1st metatarsal) and stop before the button enters the drill hole.

Inset (c) shows a small incision for passage of needle and TightRope construct.

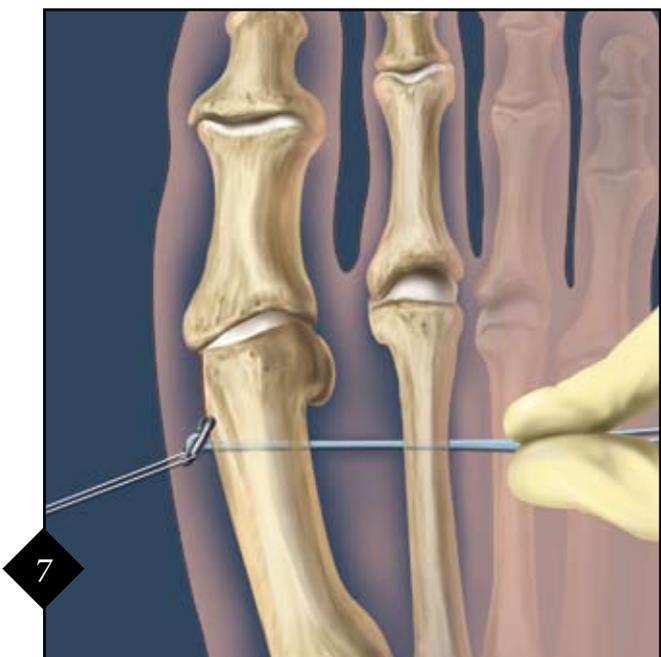
Inset (d) shows the proper orientation of the needle and drill hole.



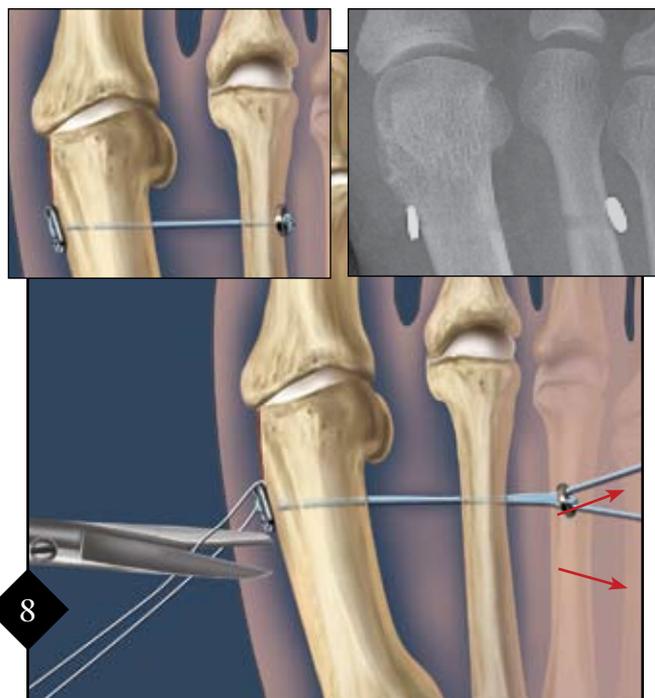
The pull-through suture can now be advanced while the guide pin is pulled medially. At the same time, apply lateral tension on the blue suture just behind the oblong button. This will help the oblong button to lie sideways, and pass easily through both bone tunnels.

**Suture Passing Option (e):**

The guide pin can be removed, leaving just the white pull-through suture. A straight Micro SutureLasso™ can then be used to pass the suture through both bone tunnels.



The Oblong Button is flipped upon exiting the medial side of the first metatarsal cortex. Apply lateral tension on the blue suture. This will help seat the Oblong Button against the bone.



The white pull-through suture is cut and removed. The surgeon should manually push the 1st metatarsal and the 2nd metatarsal together to correct the intermetatarsal angular deformity. Once fluoroscopy confirms proper positioning, the trailing Round Button is tightened down by applying gradual tension on the remaining two strands of blue suture. Tie 2-3 half hitches and cut the suture. Any previously placed sutures incorporating the lateral capsule of the 1st metatarsal, the adductor tendon and the medial capsule of the 2nd metatarsal are now tied thus completing the repair.

*Alternative technique using proximal placement*



9

**Proximal Placement Option:**

Place the device using the Guidewire and drill steps starting between 2.5 cm and 3.5 cm distal to metatarsal-cuneiform joint on first metatarsal just below midline. Angle the direction of the Guidewire and drill into the superior 2nd metatarsal metaphyseal bone. Observe under the C-arm. Plantarflexion of the 3rd metatarsal will allow passage of the 1.6 mm guide pin. The fixation is now completed by the tightening of the FiberWire<sup>®</sup> and button construct.

The Lisfranc joint(s) are approached through a dorsal longitudinal incision. Anatomic reduction is achieved after thorough debridement of the interposing soft tissue or debris. Reduction of the 2nd metatarsal can be maintained by use of the Mini TightRope. The Guidewire is directed from the medial aspect of the first or medial cuneiform obliquely toward the base of the 2nd metatarsal. The Round Button is placed at the base of the 2nd metatarsal, while the Oblong Button is seated



over the medial aspect of the first cuneiform. Using the same line of approach, the Round Button can be placed against the first cuneiform with the Oblong Button seated over the lateral aspect of the base of the 2nd metatarsal (distal to the articulation between the 2nd and 3rd metatarsals).

*Alternate reduction orientations include:*

- 1st metatarsal to 2nd metatarsal
- Cuneiforms (1st, 2nd and 3rd)
- 2nd metatarsal to 2nd cuneiform

## *Ordering Information*

Mini TightRope Repair Kit, sterile, single use

AR-8911DS

*Kit Contents:*

1 - Cannulated Drill Bit

1 - Round Button, 5.5 mm

1 - Oblong Button, 2.6 mm

1 - TightRope Guide Pin, 1.6 mm

1 - Guidewire

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*Accessories:*

1 - Micro SutureLasso, straight

AR-8703

1 - Drill Guide, reusable

AR-8911G

# Introduction

The treatment of hallux valgus deformity includes the assessment of the hallux valgus angle, the intermetatarsal angle and the contribution of an interphalangeus deformity. Additionally, there must be an assessment of the presence or absence of arthritic involvement of both the first metatarsocuneiform joint and the first metatarsophalangeal joint. Other considerations are the orientation of the distal metatarsal articular angle and the orientation and stability of the first metatarsocuneiform joint.

Various methods have been described to correct the intermetatarsal angle. Soft tissue correction can be achieved by suturing the lateral capsule of the first metatarsal to the medial capsule of the second metatarsal, incorporating the intervening, previously released adductor tendon. A loss of reduction can occur due to the forces that oppose the suture repair as well as the possibility that poor tissue quality can contribute to a loss of reduction.

In the presence of more rigid deformities the intermetatarsal angle is reduced by using a distal or proximal osteotomy of the first metatarsal. Such osteotomies can be technically challenging. A rather daunting list of consequences and potential complications include delayed union, malunion, nonunion, excessive shortening of the first metatarsal, avascular necrosis, hardware failure and prolonged protected ambulation.

The Mini TightRope is useful as an alternative and adjunct method for reduction of the intermetatarsal angle. A FiberWire® and button construct is placed across (distally or proximally) the first and second metatarsals. As the FiberWire is tightened, the intermetatarsal angle is reduced to a normal angle (less than 9-11°). The suture tied over the lateral button maintains a secure reduction of the intermetatarsal angle. Used alone or in conjunction with the distal soft tissue intermetatarsal repair, this technique affords a greater degree of strength and security than can be achieved with the soft tissue repair alone. Additionally, the Mini TightRope System provides a more technically straightforward method of reducing and maintaining the intermetatarsal angle than with conventional osteotomies while avoiding the complications associated with osteotomies.



Pre-Op  
(*weight-bearing*)



One Month Post-Op  
(*nonweight-bearing*)

## Post-Op Instructions

Following bunion correction using the Mini TightRope, the patient is placed in a soft dressing and is allowed to bear weight with a walking boot or a postoperative stiff soled shoe. Change the dressing weekly with suture removal at week two or three, pending the status of the incisions. Most patients are allowed to wear a comfortable shoe with a wide toebox about 4-5 weeks post-op. Postoperative instructions may vary for patients undergoing other procedures (i.e. hammertoe repair).

In contrast, patients undergoing distal or proximal osteotomies generally require protected weight-bearing with a post-op shoe or boot for a period of 8-12 weeks, depending on the rate of bony healing following the osteotomy. Therefore, the TightRope can dramatically reduce the post-op morbidity with respect to footwear for patients.

*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.*



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