

# TREATMENT OF ACUTE LISFRANC LUXATIONS WITH THE ARTHREX TIGHTROPE SYNDESMOSIS REPAIR KIT

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Traumatic Lisfranc injuries to the foot can be permanently disabling. In an acute setting, a luxation of the tarsal metatarsal articulation, which is surgically reduced and stabilized, may decrease the chances of developing osteoarthritis. To date, temporary fixation with the use of Kirschner-wires and/or screws has been utilized to stabilize the joint with the future need of a second surgery to remove the implants.<sup>1</sup> With the use of the Arthrex TightRope syndesmotic repair kit, percutaneous stabilization can be achieved after proper intra-operative reduction, with no need for removal.

The Arthrex TightRope syndesmotic repair kit was originally indicated for ankle syndesmotic injuries. It was created to stabilize the syndesmosis apparatus without need for removal of a trans-syndesmotic screw. It could be used with or without internal fixation, depending on the type of injury; a rotational type ankle fracture (Figure 1) or an isolated distal syndesmotic injury or high ankle sprain (Figure 2). Recently, surgeons have expanded the use of TightRope to other osseous injuries including Lisfranc luxations,<sup>2</sup> hallux valgus, and the shoulder.

The TightRope kit contains a low profile implant that is comprised of a 4-strand continuous #5 FiberWire loop, which is threaded between two metallic buttons (Figure 3). When the implant is placed through a drill hole and tensioned, the metallic buttons will sit external to the cortex of the 2 bones brought together (for example, metatarsal and cuneiform, tibia and fibula, etc.) Clinical trials have shown equivalent strength and good surgical outcome of suture-button syndesmosis fixation to standard treatment of syndesmotic injuries of the ankle.<sup>3</sup>

Surgical technique for use of the TightRope kit for an acute Lisfranc joint luxation includes intra-operative reduction under fluoroscopy, followed by percutaneous insertion of the

TightRope. This is performed easiest with the use of a guide pin or Kirschner-wire followed by a cannulated drill bit (Figures 4-15). The author used a 0.062 inch smooth Kirschner-wire followed by a cannulated 3.2mm drill bit.

Recently, Arthrex has introduced TightRope accessories including a 0.049 inch guide pin and a cannulated 3.56mm drill bit for assistance to insert the implant. Standard postoperative care for surgical treatment of Lisfranc injuries is followed with 6 to 8 weeks of a short leg cast and non-weight-bearing status. There is no need for removal of the implant unless there is irritation from the metal buttons or suture knots. Arthrex recommends a slightly longer tail when cutting the suture to decrease the prominence of the knot.



Figure 1. Use of a TightRope with internal fixation for a pronation-external rotation type ankle fracture.



Figure 2. Use of a TightRope for an isolated ankle syndesmotomous injury. These injuries can be diagnosed with an MRI.

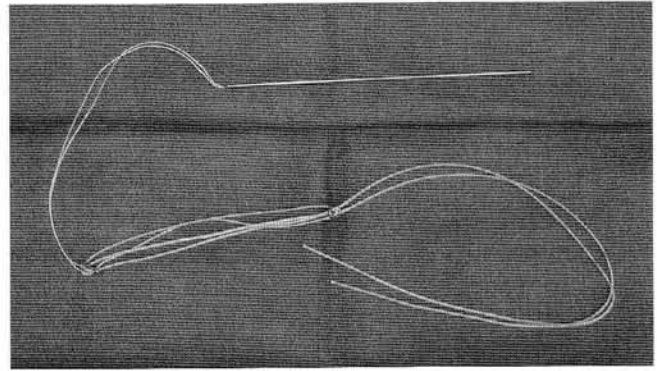


Figure 3. The TightRope kit contains a low-profile implant comprised with a 4-strand continuous #5 FiberWire loop that is threaded between 2 metallic buttons.



Figure 4. Intra-operative prerotation radiograph of an acute Lisfranc joint luxation.



Figure 5. An external bone reduction clamp is used to reduce the luxation.



Figure 6.

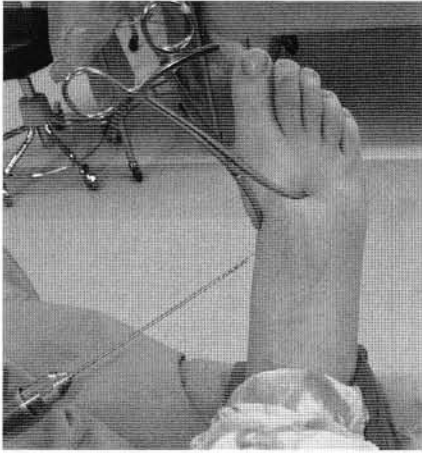


Figure 7. A cannulated drill bit is passed over the guide pin where the implant will be inserted.

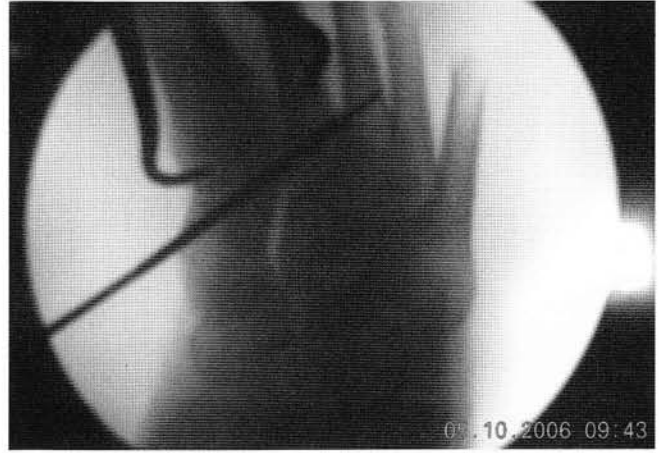


Figure 8.

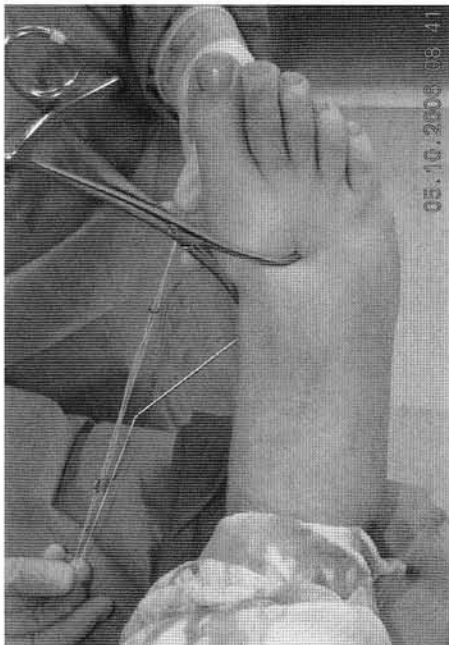


Figure 9. The guide pin and drill bit are removed and the TightRope is inserted while connected to a needle.

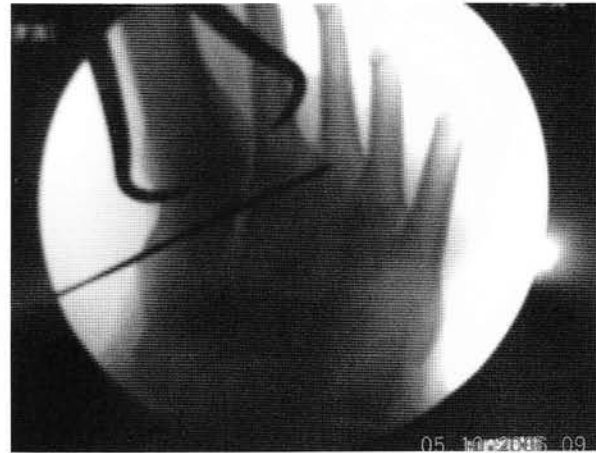


Figure 10.

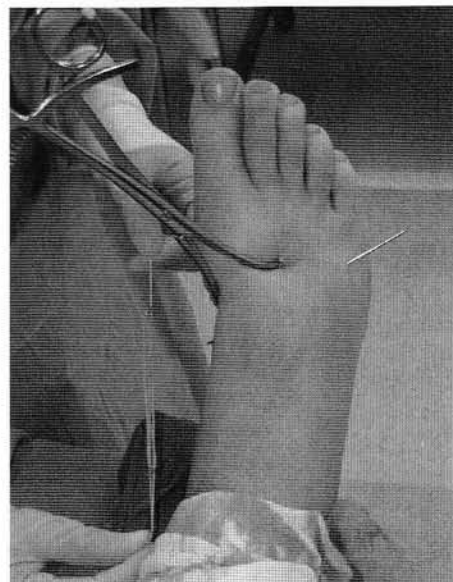


Figure 11. The needle passes through all cortices and out the skin after the last cortex.



Figure 12. The implant is toggled until the lateral metallic button is flat against the last cortex.



Figure 14.



Figure 15. Preoperative view of a 29-year-old male patient with an acute Lisfranc luxation.

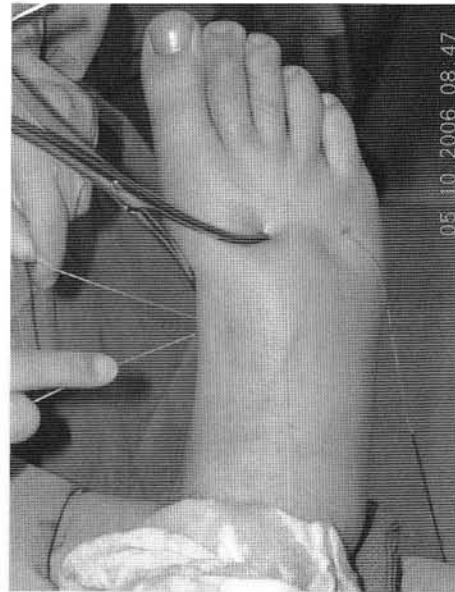


Figure 13. The FiberWire is tensioned, tied, and cut. As the knot is tied, the medial metallic button is laid flat against the first cortex. Suture ends are cut medially, leaving one centimeter to allow the knot and suture to lay and remain low profile. The needle and remaining FiberWire are cut flush laterally.



Figure 16. Immediate postoperative view.



Figure 17. Three-month postoperative radiograph.



Figure 18. Preoperative view of a 26 year-old female patient with an acute Lisfranc fracture dislocation.



Figure 19. Immediate postoperative view.



Figure 20. Six-month postoperative radiograph.

## REFERENCES

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