# Non-Arthroscopic Minimally Invasive Lateral Ankle Stabilization Jesse Borys, DPM, Ali Anaim, DPM, Renata Milman, DPM, FACFAS

### **Statement of Purpose**

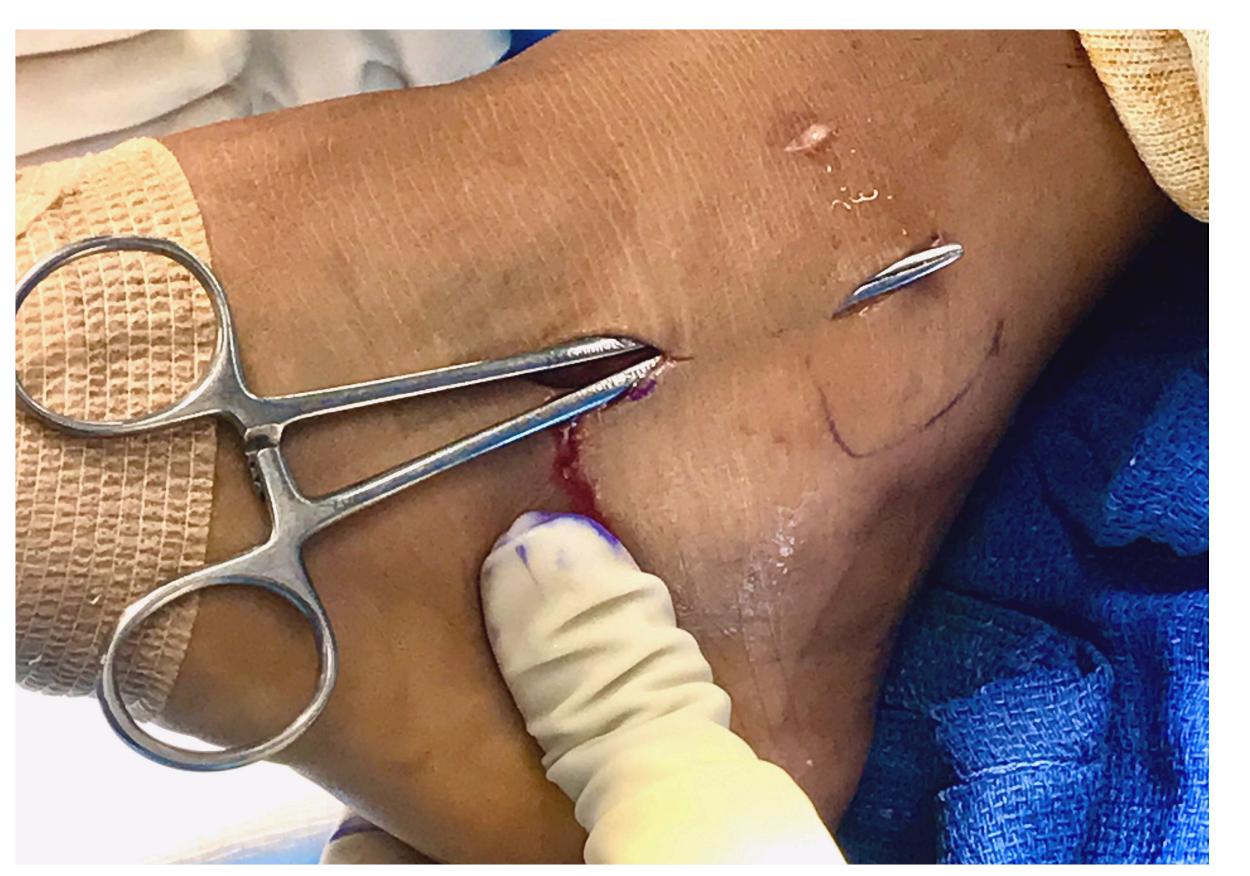
Novel technique allows for augmentation of the anterior talofibular ligament (ATFL) with two minimally invasive 1.5 cm incisions, without an arthroscope, and maintains the extensor retinaculum and soft tissue. Augmentation of the ATFL is also commonly referred to as a lateral ankle stabilization. Percutaneous procedures or minimally invasive procedures have much smaller incisions which reduce closure time and decrease the chance and severity of incision site complications such as delayed healing, dehiscence and scar formation. Smaller incisions can cut down on the overall length of surgery by reducing dissection time and closure time. This novel technique allows for augmentation of the ATFL with two minimally invasive 1.5 cm incisions. This has all the benefits of a minimally invasive incision, maintains the extensor retinaculum, and is extracapsular which greatly lowers the risk of impingement of suture material into the ankle joint.

## **Case Report**

A 50 year-old female presented with a torn ATFL confirmed on MRI. She experienced lateral ankle instability and reported that she frequently fell and twisted her ankle. She also complained of pain during ambulation in her ankle joint and moderate arthritis was noted on x-ray. It was decided that an ankle arthroscopy with adjunctive lateral ankle stabilization would be performed. One small 1.5 cm incision was made over the lateral sinus tarsi. This is carried down to the plantar-lateral aspect of the sulcus tali of the talus. A 3.4 mm drill is used inserted into the plantar lateral aspect of the talus (which is considered the shoulder of the talus body) and is drilled in a dorsal medial direction towards the posterior aspect of the medial malleolus. A 4.75 mm tap was used then a 4.75 mm anchor loaded with suture tape was inserted into the drill hole. Another small 1.5 cm incision was made over the anterior aspect of the lateral malleolus, about 2 cm from the distal tip. Then using a hemostat, the suture tails are passed from the sinus tarsi incision under the extensor retinaculum, but above the ankle capsule, to the fibular incision site. Ensure that there is a bump underneath the ankle and not underneath the heel as this will cause the Talus to become anteriorly displaced which will make the suture tape too loose. The Fibula is then drilled with a 3.4 mm drill and the suture tape is inserted into the 3.5 mm. The tip of the anchor was then lined up with the bone anchor and the suture tape was marked at the

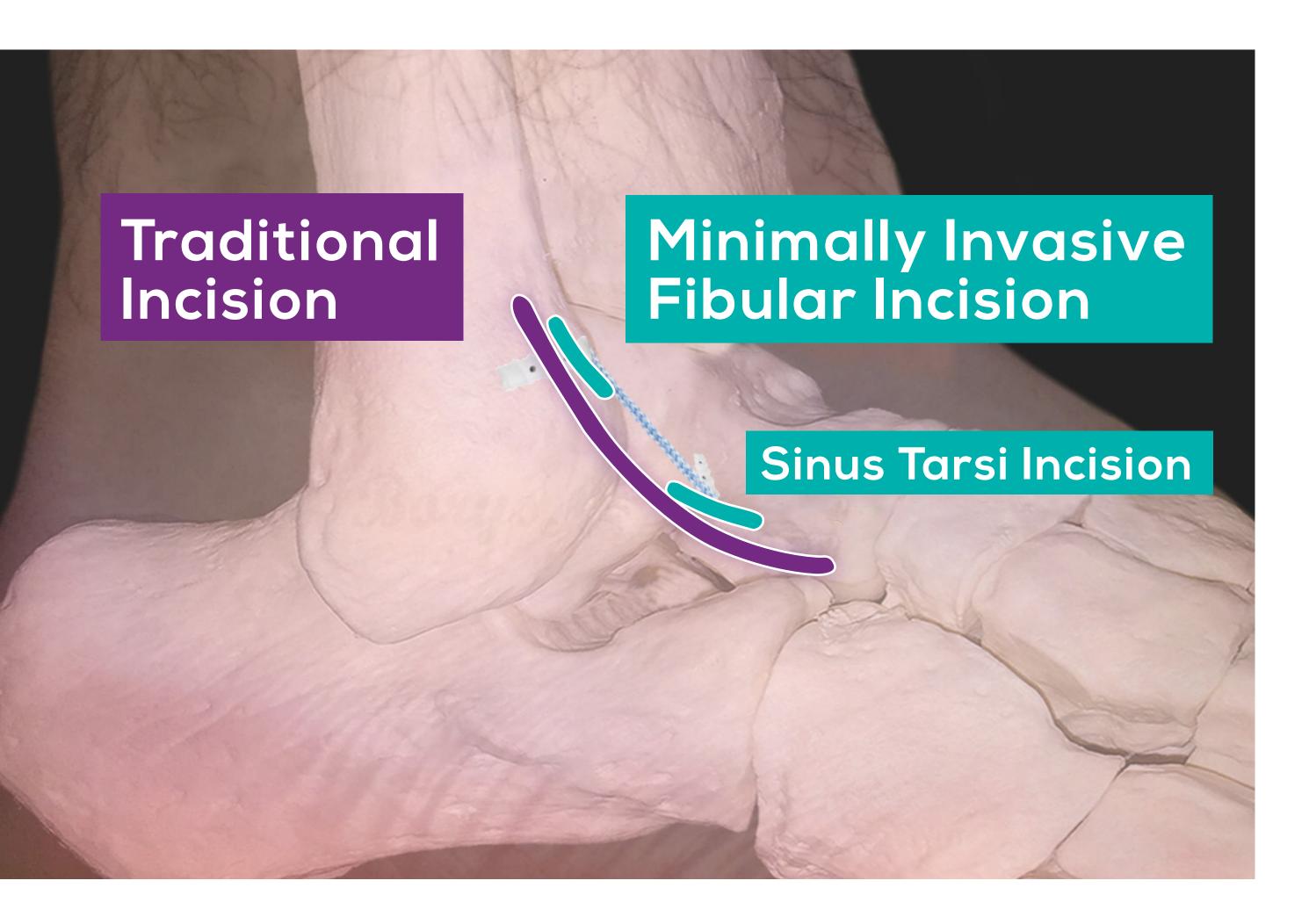
laser line. After the suture tape was marked, the tip of the anchor was then slid back to that mark to achieve proper tensioning. The anchor is inserted into the drill hole and screwed into the tunnel. the excess suture tape is cut with a #10 blade. The foot is inverted to ensure inversion of the rearfoot was reduced to around 20 degrees.





### Analysis & Discussion

This minimally invasive approach incorporates the benefits of a percutaneous procedure and does not require an arthroscopy of either the ankle or STJ, however it is often performed in conjunction. Technique allows for two small 1.5 cm incisions and maintains the extensor retinaculum and surrounding soft tissue, compared to an open approach. Compared with the arthroscopic approach, there is not risk of impingement of suture material into the lateral ankle gutter because the suture tape is not inside the ankle joint. The suture material is kept extracapsular between the extensor retinaculum and the ankle capsule.



#### Results

Rearfoot inversion was reduced from 45 degrees to 20 degrees. This was measured intra-op using a goniometer, before and after insertion of anchors and suture tape.

For lateral ankle stabilization, both the minimally invasive approach and the arthroscopic approach have a steeper learning curve than an open approach with a large 6 – 8 cm incision. The incision for the fibular anchor is much easier to palpate and correctly place than the incision for the talus anchor. For the fibular incision, just palpate the anterior border of the lateral malleolus and go approximately 2 cm above the distal aspect of the lateral malleolus. The incision for the talar anchor is made at the site a sinus tarsi injection would be performed. Once a small incision is made, the shoulder of the lateral body of the talus can be felt with a hemostat before placing the drill there. The drill is aimed from the distal lateral plantar aspect to the dorsal posterior medial aspect, aim towards the posterior aspect of the medial malleolus. A K-wire could be used with C-arm to ensure placement and then the drill used overtop the K-wire. Lateral ankle stabilization outcomes are best measured by talar-tilt on stress inversion radiographs pre and post-op, an alternative is to measure rearfoot inversion. Personal post-op measurements of inversion have been consistently reduced to around 20 degrees of inversion with a negative anterior drawer. Future studies should be performed to correlate reduction of talar-tilt on stress radiographs to rearfoot inversion reduction measured with a goniometer.

The non-arthroscopic minimally invasive approach to lateral ankle stabilization benefits include its small incisions, maintains the extensor retinaculum and is extracapsular which greatly lowers the risk of impingement of suture material into the ankle joint.

#### References

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