Arthrex Presents:

Breakthroughs in Foot and Ankle Technology

AOFAS 2025

We are excited to welcome you to the 2025 AOFAS Annual Meeting in Savannah, GA. Arthrex has been proud to support the advancement of foot and ankle surgery through a variety of initiatives, including conducting more than 65 hands-on educational trainings in minimally invasive surgery (MIS) as well as six Foot and Ankle Medical Education courses over the last year. These collaborative events have played a pivotal role in driving innovation and enhancing surgical outcomes. We have recently launched groundbreaking products such as the DualCompression hindfoot fusion nail and the MIS FiberTak® Achilles SpeedBridge™ repair implant system as we continue our unwavering commitment to foot and ankle surgeons.

Our innovative DualCompression hindfoot fusion nail remains the only nail on the market featuring a patented cable technology, delivering significant time-zero compression for ankle and subtalar joints while leveraging a nitinol core for continuous postoperative compression.

Additionally, the MIS FiberTak Achilles SpeedBridge implant system introduces the latest evolution of our trusted double-row fixation technique for insertional Achilles tendon repair, now in an MIS or percutaneous technique and featuring 25% less implant material.[1]

We invite you to visit our booth to explore these innovative solutions and experience them hands-on with our 3DAnatomy™ technology. Join us as we continue to advance surgical innovation and patient care together.

Reference

1. Arthrex, Inc. Data on file (APT-05964). Naples, FL; 2023.

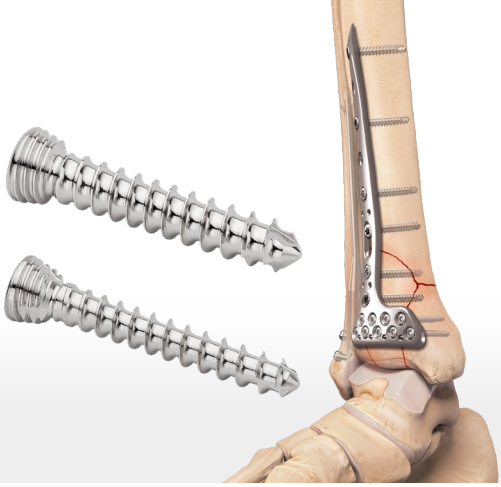
Michael Karnes
Director, Product Management
Foot & Ankle and Trauma

Better with BIO™

Arthrex®

New Product Highlight

Pilon Fracture: SS Distal Tibia Plating With VAL Screws and ArthroFX® Upgrades



Arthrex is expanding its complement of treatment options for distal tibial pilon fractures with several updates to its plating and external fixation portfolio.

Stainless Steel VAL Screw Technology

Arthex is proud to launch stainless steel variable-angle KreuLock™ locking compression screws that can be paired with the entire stainless steel plating portfolio, including the Arthrex Distal Tibia Plating System.

The addition of variable-angle locking (VAL) technology vastly increases the utility of these low-profile, anatomically contoured plates.

These VAL screws feature the same biomechanical advantages of KreuLock screws[1]:

- Increased interfragmentary compression
- Increased plate-to-bone compression
- Comparable construct stiffness
- Comparable axial and angular stability

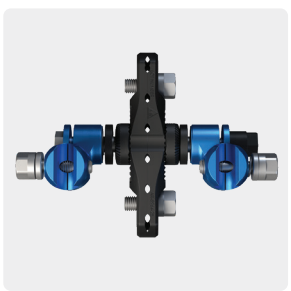
ArthroFX Clamp Additions

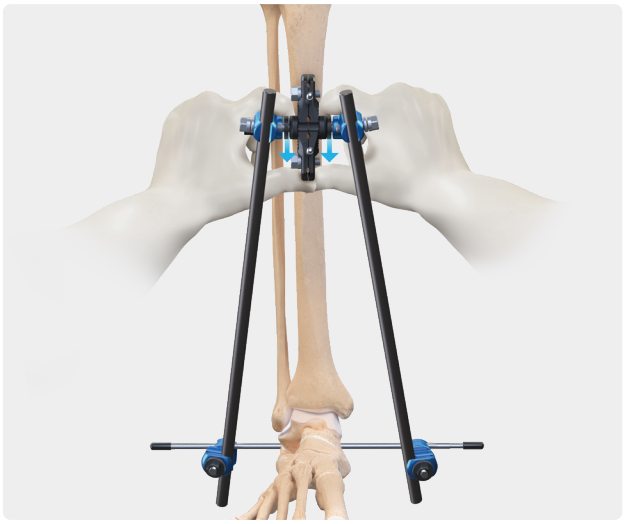
Arthrex is pleased to announce the launch of several upgraded components to its ArthroFX external fixation system. The compression/distraction multiclamp greatly enhances the versatility of the ArthroFX system.

Compression/Distraction Multiclamp

The ratcheting base of the updated multiclamp allows surgeons to make intraoperative adjustments after the bars have been locked in the construct.

- 34 mm of compression or distraction
- 14° of varus/valgus adjustment
- Independently locked
- Provisionally holds compression or distraction prior to final tightening





Compression/Distraction Multiclamp

Reference

1. Koroneos ZA, Alwine S, Tortora P, et al. Bicortical compression and construct stability with variable pitch locking screws in cadaveric specimens. *J Orthop Trauma*. 2024;38(10):e339-e346. doi:10.1097/BOT.0000000000002869

What's in My Bag?

Multidirectional Ankle Instability

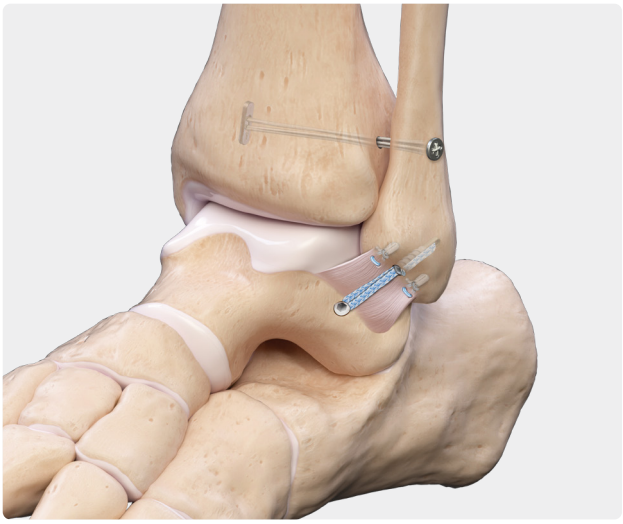
Norman E. Waldrop III, MD

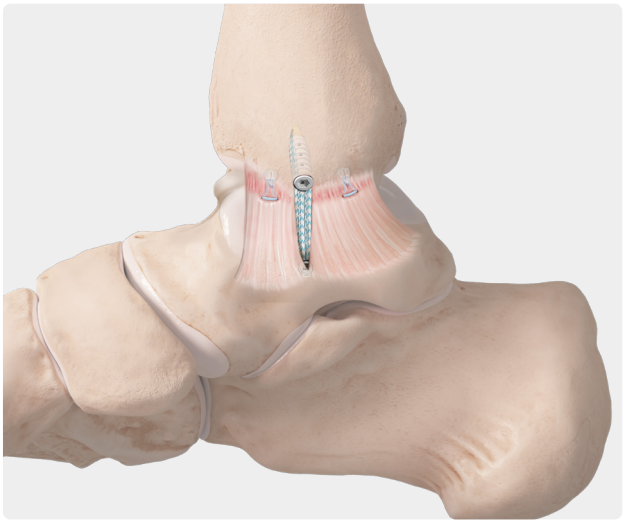
How important a role does arthroscopy play in your treatment of patients with chronic ankle instability?
Arthroscopy is critical. I perform arthroscopy in all these patients, and I consider it an integral part of the procedure. It provides a full picture of the pathology. Not only does this allow me to visualize the cartilage and synovitis within the joint, but I can also assess the intra-articular portions of these ligaments to see how their morphology and changes affect the overall picture. I can also use the scope to assess the stress test and evaluate how the talus is moving within the mortise using that stress. This allows me to understand what is going on in the joint within the instability pattern the patient is experiencing.

What are your thoughts on the current literature now indicating that there is no such thing as a "simple" ankle sprain?
I do think missed subtle medial instability is a cause for failures in patients with chronic lateral instability. It is important to assess medial involvement in all patients. If the instability is more pronounced, the medial side may be a larger contributing factor. Certainly, in patients with a failed previous Brostrom repair, the medial side needs a careful examination because I believe that is a contributing factor to failure in many cases.

How are you surgically addressing your multiligament patients?
In the chronic multiligament instability patients, typically, I use 2 DX Knotless FiberTak anchors for both the ATFL and the CFL and augment the repair with an *Internal*Brace™ ligament augmentation procedure. On the medial side, I imbricate the anterior deltoid with a double-loaded FiberTak anchor, but occasionally, given how much damage is present to the ligament, I will augment the repair using the *Internal*Brace procedure. The same applies to the syndesmosis. I use a TightRope® XP to stabilize the repair, but given the ease of the access to the AITFL and the anterior lateral tubercle on the tibia, I will use a single-limb *Internal*Brace ligament augmentation procedure over the top of the AITFL repair if needed.

How often are you augmenting the deltoid and syndesmosis in these patients?
I don't know the exact numbers for how often I augment the syndesmosis and/or the deltoid in these instability patients. I would venture to guess that about 25% to 33% now get concurrent augmentation of either the syndesmosis or the deltoid. For these patients, I would say that fixing the deltoid is more common than the syndesmosis.





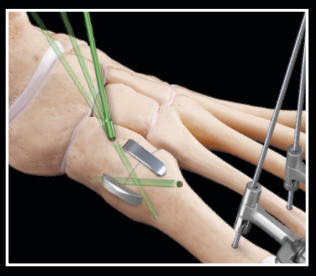
The *Internal*Brace surgical technique is intended only to augment the primary repair/reconstruction by expanding the area of tissue approximation during the healing period and is not intended as a replacement for the native ligament. The *Internal*Brace technique is for use during soft tissue-to-bone fixation procedures and is not cleared for bone-to-bone fixation

Lapidus Reduction Clamp

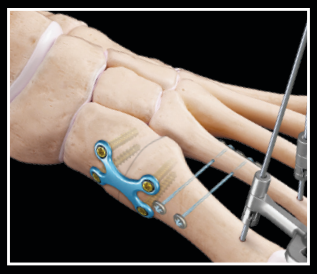
Design Simplicity Allows Surgeons to Choose Their Implant and Approach

Frontal plane rotation and intermetatarsal angle can be corrected independently and secured using one instrument.

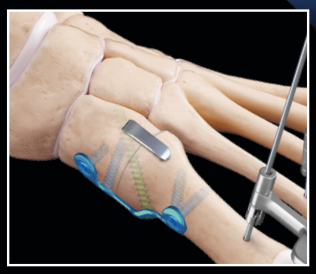
Guidewire Sleeves
Allow for a percutaneous solution for reduction



Snap-Off Compression FT Pins



Knotless Mini TightRope® Implant

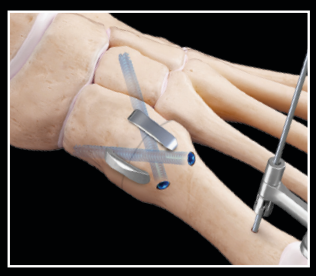


Plantar Lapidus Plate/ DynaNite® SuperMX™ Staple

Rotating Arm
Allows for dialed-in rotational correction

Spin-Down Clamp
Closes the IMA using 1.6 mm guidewires

Lapidus T-Plate/KreuLock™ Locking Compression Screws



DynaNite SuperMX Staples/Compression FT Screws

Learn more about the Lapidus Reduction Clamp

Arthrex®

Surgeon Perspective

MIS FiberTak® Achilles SpeedBridge™ Technique

Nicholas L. Strasser, MD

Initial Impressions

When I first heard about the MIS FiberTak Achilles SpeedBridge technique, I had mixed reactions.

The Positive Aspects

› Percutaneous approach reduces wound complications:
Small incisions help avoid the notorious posterior heel wound-healing issues.[1]

› Maintains strong fixation:
The updated rip-stop configuration prevents suture cut-through, which was a concern with earlier double-row techniques.[2]

› Faster return to weight-bearing:
A more stable construct and much less soft- tissue disruption could allow for earlier rehabilitation protocols, shortening recovery time.[1]

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.

Initial Hesitations

› Visualization limitations:
Could the percutaneous approach adequately remove pathology, particularly for cases with significant intratendinous calcifications?

› Learning curve:
Open repairs are well established, but transitioning to MIS requires a new skill set, particularly in bony resection and tendon preparation.

› Fixation security:
Would the smaller Knotless 2.6 DX FiberTak and 3.9 mm DX SwiveLock® anchors provide enough pull-out strength compared to traditional 4.75 mm anchors?

Despite these initial reservations, early experience with the technique has been overwhelmingly positive.

Early Experiences and Patient Outcomes

Having now performed over 50 cases using the MIS FiberTak Achilles SpeedBridge technique, the results have been excellent.

› Patients mobilizing earlier

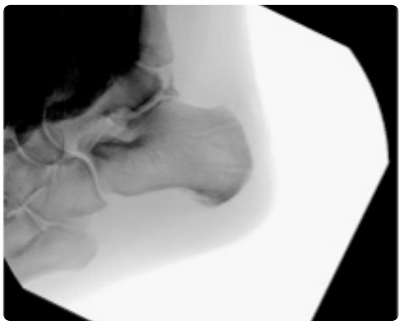
› Lower wound complication rates:
Compared to open techniques, percutaneous incisions appear to reduce infections and healing delays.[1]

› Superior functional outcomes:
Patients have returned to activity even faster than with traditional open repair.[1]

One key takeaway is the importance of aggressive yet controlled bony resection. Leaving residual calcifications or failing to contour the calcaneus properly may contribute to persistent postoperative tendon thickening.

The biggest technical challenge has been optimizing fluoroscopic guidance for precise resection and ensuring proper suture passage without unnecessary soft-tissue disruption.

Pre-op



Post-op

Summary

Transitioning from open to minimally invasive insertional Achilles repair requires a commitment to technique refinement. While the learning curve is real, once mastered, the procedure can be streamlined, offering:

- Lower wound complication rates[1]
- Improved biomechanical strength[2]
- Earlier return to function for patients[1]
- Decreased risk of shoe conflict

For those new to the technique, consider:

- Starting with a hybrid approach—performing MIS fixation with a small open incision to gain comfort.
- Cadaveric training and observation of experienced MIS surgeons.
- Understanding the biomechanics of rip-stop fixation to ensure optimal anchor placement.

With refinement, the MIS FiberTak Achilles SpeedBridge technique has the potential to become the new standard for treating insertional Achilles pathology. It would significantly reduce the morbidity associated with open techniques while directly addressing the pathology.

References

1. Hsu AR, Jones CP, Cohen BE, Davis WH, Ellington JK, Anderson RB. Clinical outcomes and complications of percutaneous Achilles repair system versus open technique for acute Achilles tendon ruptures. *Foot Ankle Int*. 2015;36(11):1279-1286. doi:10.1177/1071100715589632
2. Vora A, Ingwer SJ, Withrow M, Denove N, Hauck O, Khoury A. Double-row Achilles insertional repair with rip-stop increases construct strength compared to traditional techniques: a biomechanical study. *Foot Ankle Int*. 2024;45(5):535-541. doi:10.1177/10711007241227948

Case Review

MIS Hallux Valgus Correction in Early Hallux Rigidus

Anish R. Kadakia, MD

Presentation

A young, active female patient presented primarily complaining of pain on the medial and dorsal aspect of her foot during shoe wear. The pain was resolved when walking barefoot or in flip-flops/open-toed shoes.

Radiographic evidence showed an increased IM angle with mild arthritis at the MTP joint.

Patient wanted to remain active doing yoga, Pilates, and dancing.

Surgical Considerations

Open Bunionectomy

Risks violating the MTP joint, leading to increased stiffness and poor outcomes.

Open Cheilectomy

Does not resolve the hallux valgus deformity; excess medial eminence resection may result in worsening of the deformity.

Lapidus

Locks the 1st TMT, stiffens the MTP, and can result in pain/limited motion. Shortening can lead to an elevated 1st metatarsal, limiting dorsiflexion and causing transfer metatarsalgia.

MTP Fusion

Results in loss of motion at the 1st MTP joint. Patient does not have intra-articular pain from degeneration and complains of pain with shoe wear.

Surgical Solution: Minimally Invasive Bunionectomy and Cheilectomy

- Since there is no perfect option for this patient—it is either a fusion or a combination of independent solutions—success relies heavily on selecting the right patient and aligning treatment with patient expectations.
- Extracapsular osteotomy does not violate the MTP joint capsule, preventing increased joint stiffness.
- A transverse or slightly proximal angulated osteotomy with the 2 mm burr decompresses the joint, reducing intra-articular pressure and leading to pain relief.
- A dorsal cheilectomy, performed after fixation, allows for the removal of the dorsal impinging spur with low risk to violating the vascularity of the great toe and ensures that there is no compromise of bone stock for fixation.

Recovery

My postoperative protocol mirrors the standard MIS correction with immediate weight-bearing and early motion at 2 weeks.

Expectations

Patients may not regain normal motion but may achieve significant preservation of hallux valgus motion.

Future Options

Should MTP arthritis and pain develop in the future, the pathway for an MTP fusion remains viable through an open or MIS approach.

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.

Case Review

Arthrex Mini-Rail Fixation System

Troy Watson, MD

Presentation

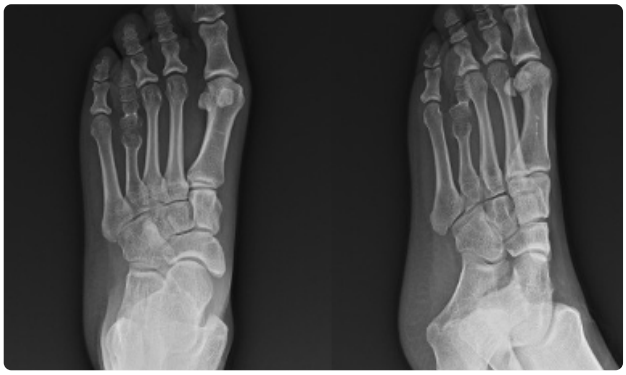
The patient was a 35-year-old female presenting with congenital deformity of brachymetatarsia of the left 4th metatarsal. Her main complaint was painful ambulation over her shortened ray, but she also complained of cosmetic shortening.

Surgical consultation included discussion over the use of the Arthrex Mini-Rail Fixation System vs lengthening osteotomy with intercalary graft placement and plate fixation.

Final procedure selection included 4th metatarsal lengthening osteotomy with placement of the Arthrex Mini-Rail Fixation System for distraction osteogenesis and pinning across the MTP joint to prevent dorsiflexion of the toe upon lengthening. Additional soft-tissue MTP release was performed percutaneously.

Decision Making

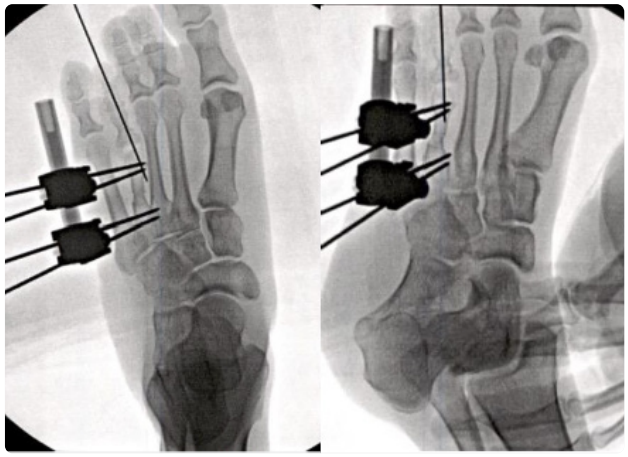
The decision to use the Mini-Rail Fixation System over plate fixation and grafting was favorable in this case for several reasons. The patient previously underwent contralateral brachymetatarsia correction with intercalary allograft placement and plate fixation, but the lengthening necessary for her left foot correction precluded the use of this technique. We preoperatively templated that lengthening of around 20 mm would be necessary to restore a nice metatarsal head parabola of the forefoot. This system provided a more protective construct for her soft tissue and vasculature to allow for a more gradual lengthening of the metatarsal. The Mini-Rail System also allowed for precise lengthening of the affected ray, permitting subtle length changes until both the patient and surgeon were content with the toe length.



Surgical Technique

The patient was taken to the operating room and under fluoroscopic guidance, we marked out the bony landmarks of the 4th metatarsal and MTP joint. Next, we marked the location for our proximal metatarsal osteotomy at the junction of the metaphyseal and diaphyseal bone. Threaded K-wires from the Mini-Rail Fixation System were then used both proximally and distally for fixation. The K-wires were inserted into the bone under power at a 45° angle to the metatarsal.

Traveling clamps were selected and placed on the proximal portion of the rail, allowing for sufficient length distally for distraction postoperatively. With the mini-rail fixed, an MIS burr from the Arthrex MIS console was used to make a transverse cut in the metatarsal. Once the osteotomy was performed and confirmed, the distal clamp was adjusted to apply compression through the patient's osteotomy for the first week following surgery. Lastly, a percutaneous dorsal capsular release was performed under fluoroscopy and a wire was then placed from the tip of the 4th toe across the MTP joint to prevent dorsiflexion of the toe while lengthening over the ensuing weeks. The patient was placed into a posterior splint before being taken to the recovery room.



Postoperative Protocol

At the first postoperative visit, the patient was advised on the lengthening protocol of 4 quarter-turns of the driver per day to reach appropriate length of the metatarsal. This pace of lengthening was estimated to achieve our preoperative templated amount of lengthening in roughly 3 weeks. The patient was experiencing some postoperative pain with that amount of lengthening each day, so we reduced the lengthening to 2 to 3 turns spaced throughout the day until she reached the ideal length around week 4-5.

Lengthening was halted once the 4th metatarsal head sat between the 3rd and 5th metatarsal heads, and the toe clinically looked natural in its position. Total lengthening was 21 mm over this time. The mini-rail was then left in a static position to allow for consolidation of the lengthened metatarsal. Typically, the mini-rail is left in place for a period twice as long as the lengthening time, but radiographic consolidation is an important parameter for frame removal. Pin removal and toe range-of-motion exercises can begin after lengthening is complete. In this case, the mini-rail was removed approximately 3 months after placement.

The patient remained non–weight-bearing for approximately 8 weeks, with serial radiographs to determine level of metatarsal union. Crutch-assisted weight-bearing was initiated once appropriate bone callus was formed, and the mini-rail was removed once the surgeon was content with bone formation.

What features or benefits did the Arthrex Mini Rail provide that allowed you to treat this patient in a way that other systems may not offer?

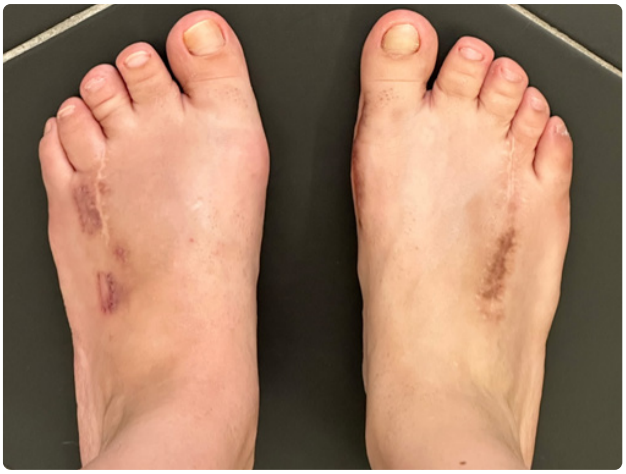
Specifically in this case, the Arthrex Mini-Rail System allowed for a significant amount of lengthening with precise fine-tuning, as opposed to using a single-stage procedure with plate fixation. Additionally, when lengthening greater than 10-12 mm, I prefer to use a frame to gradually distract and achieve the desired result with less risk to the neurovascular bundle.

What technique pearls can you offer from your experience using the Arthrex Mini Rail?

Using the Arthrex MIS burr and fluoroscopy can limit your incision and keep this procedure largely percutaneous. If there is not enough bone in the proximal metatarsal to achieve two-pin fixation, then placing one pin into the cuboid may be beneficial. Lastly, be cognizant of where the frame will sit and make certain there is adequate clearance from the underlying skin to avoid irritation from the frame.

For which foot and ankle pathologies in your practice do you see the Arthrex Mini Rail providing a solution?

This system provides a solution for several pathologies seen in my practice including, but not limited to, metatarsal lengthening, metatarsal fractures, and crush traumatic injuries in the midfoot or forefoot that may require a spanning external fixator.



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.

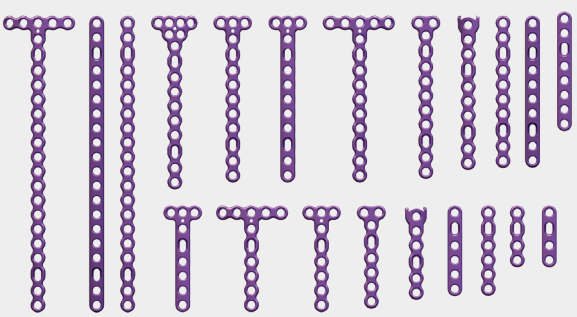
What's in My Bag?

Trauma Mini Fragment System

Carson Rider, MD

Describe the evolution of mini fragment fixation and how you've seen it change over the course of your career.
During my residency training, mini fragment systems were rudimentary. Sets came with a small number of plates to choose from, and the screw options were limited. Over the last several years, the mini fragment market has exploded. In my opinion, the Arthrex Mini Fragment System has set the standard due to the huge number of plate and screw options and extremely user-friendly nature of their comprehensive Mini Fragment System.

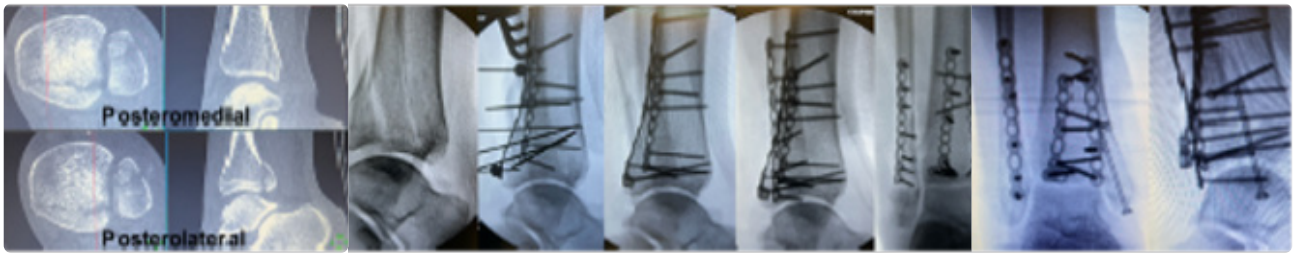
What role does mini fragment fixation have in your practice?
I spend 1 to 2 days a week at a level 1 trauma center tackling foot and ankle trauma. I also receive numerous outpatient trauma referrals from outside facilities in my private clinic. Now that I have the Arthrex Mini Fragment System in my armamentarium, I am confident that I can address anything that comes through the door. This system has been a game changer for addressing traumatic injuries around the foot and ankle due to the plethora of fixation options that allow me to address traumatic pathology from the metatarsals to the tibia. I have also found the plating system useful for provisional fixation during intramedullary nailing of tibial shaft injuries and as supplemental stabilization of intra-articular pilon fractures. In my opinion, the sky is the limit given the excellent versatility of the Arthrex Mini Fragment System.



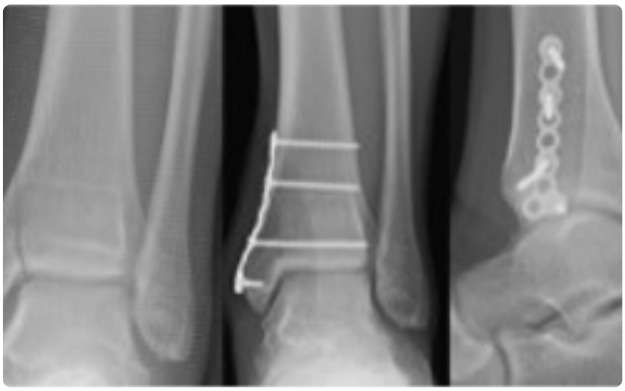
How has the Arthrex system addressed your needs from a system and implant standpoint?
The Arthrex Mini Fragment System not only allows me to address a wide variety of pathologic or traumatic conditions about the foot or ankle, but it also allows me to significantly enhance surgical efficiency in the operating room. The seemingly endless array of plate and screw sizes allow me to address any traumatic injury about the foot or ankle. Once I have chosen my plate, the color-coded instrumentation makes organizing the back table and case flow extremely efficient. There are multiple tools within the set that allow me to cut, bend, and contour my plate to fit any anatomic location. The drill guides and depth gauges also enhance case efficiency since they allow me to obtain quick and accurate measurements during screw insertion. The KreuLock™ screws and low-profile design of the plates help minimize the risk of hardware irritation, which is another highlight of the system. There is no need that goes unaddressed with the Arthrex Mini Fragment System.

What injury pattern immediately points you in the direction of Mini Fragment System plating?
There are 3 injury patterns that I routinely address with the Arthrex Mini Fragment System:

1. Posterior malleolus fractures



2. Vertical shear medial malleolus fractures (supination-adduction injuries)



3. Comminuted midfoot fractures that are not amenable to stand-alone staple fixation staple fixation

Case Review

Interfyl® Matrix Used in Chronic Plantar Ulcers

Kevin Martin, DO

Presentation
An 84-year-old woman had chronic foot pain for more than 2 years without any history of trauma or injury. She developed worsening deformities of her toes and plantar metatarsal pain. She went on to develop a plantar ulcer under the 3rd metatarsal head. She was seen by multiple foot and ankle specialists and managed by a wound care clinic, all with no resolution of the pain and ulcer.

Imaging
Weight-bearing foot images demonstrated multiple hammertoes and gross dislocation of the proximal phalanx was well demonstrated on the CT sagittal images. MRI showed plantar metatarsal head bone edema and soft-tissue disruption. The edema could represent a stress reaction or underlying osteomyelitis.

Decision Making
The patient had failed all attempts at conservative treatment, but with the dorsal dislocations pushing the metatarsal heads plantarly and a compromised soft-tissue envelope, the potential for healing was low. Also, the patient began to have unexplained fevers that were being treated with oral antibiotics, given that metatarsal edema on MRI osteomyelitis was suspected. To minimize the soft-tissue disruption while removing the deformity and possible infection, multiple metatarsal head resections were planned. The plan also needed to maximize the biology and optimize soft-tissue capabilities.

Surgical Technique
A small stab incision was made dorsal medial to each metatarsal head and Arthrex MIS elevators were used to elevate the joint capsule. An Arthrex MIS Shannon burr (high torque, low speed) was used to morselize the metatarsal heads. This served to resolve the deforming forces while removing the potentially infected areas. The bone debris was irrigated and aspirated while fluoroscopy was used to verify the resection.

Next, the cellular environment needed to be improved, so the plantar ulcer was debrided back to a stable bleeding base. The ulcer was then irrigated and Arthrex Interfyl connective tissue matrix was delivered into the tissue void and pressurized. A JumpStart® dressing was dampened and applied weekly until the wound had epithelialized.

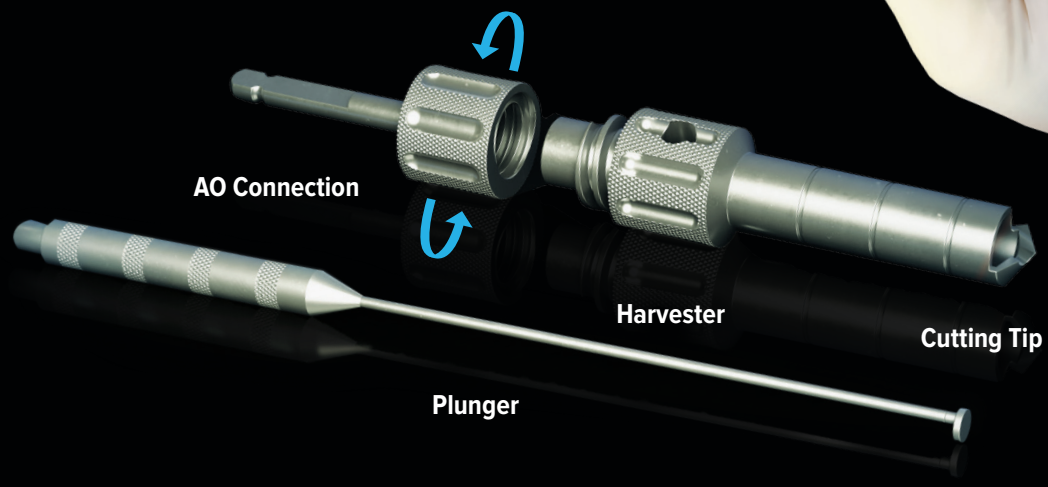
Take-Home Points
1. Minimally invasive surgery limited the soft-tissue disruption while removing the deforming force and potentially infected tissue.
2. Maximize the cellular environment—Interfyl matrix is a decellularized human placental connective tissue matrix derived from the chorionic plate. Interfyl matrix is flowable, meaning it is suited for a variety of surgical applications where there is a need to replace or supplement damaged or inadequate integumental tissue.

OsteoAuger™ Bone Graft Harvesting System

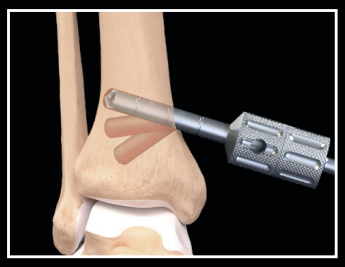
Autologous bone that naturally provides bone grafts with cell, signal, and scaffold for placement on a fracture or fusion site.[1]

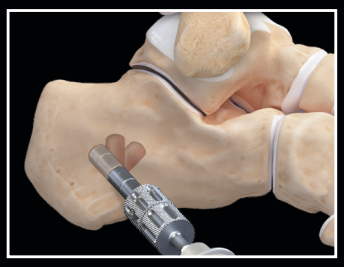
The harvester's cutting tip accurately morselizes the bone for ideal graft handling. The AO quick connection allows for easy attachment and removal of the device.

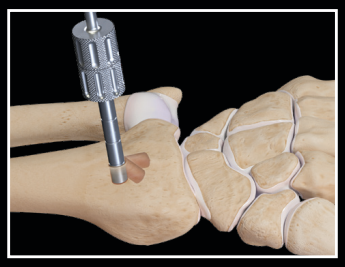
- Fully sterile system
- Pilot hole creation not required
- Available in three sizes: 6 mm, 8 mm, and 10 mm
- Plunger provided for simpler graft removal



Morselized bone can be hydrated with Arthrex ACP® platelet-rich plasma, which may increase cell proliferation and support healing.[2,3]


Distal Tibia


Calcaneus


Distal Radius

The OsteoAuger™ system can be used to recover bone at common harvest sites including the iliac crest, calcaneus, distal and proximal tibia, and distal radius.

Scan the QR Code for More Information on OsteoAuger Bone Graft Harvesting System

References

1. Baldwin P, Li DJ, Auston DA, Mir HS, Yoon RS, Koval KJ. Autograft, allograft, and bone graft substitutes: clinical evidence and indications for use in the setting of orthopaedic trauma surgery. *J Orthop Trauma*. 2019;33(4):203-213. doi:10.1097/BOT.0000000000001420
2. Arthrex, Inc. Data on file (LA0815A). Naples, FL; 2009.
3. Manini DR, Shega FD, Guo C, Wang Y. Role of platelet-rich plasma in spinal fusion surgery: systematic review and meta-analysis. *Adv Orthop*. 2020;2020:8361798. doi:10.1155/2020/83617988

Arthrex®

Deep Dive

Maisonneuve Fractures Repair Technique: Tips and Pearls (Part 1)

Thomas Harris, MD

Maisonneuve injuries have long been a source of debate regarding optimal surgical management since their initial description in 1840. They account for approximately 5% of all ankle fractures and consistently involve a medial injury. Notably, around 80% of cases also include a posterior malleolar fracture.[1] These injuries are frequently underestimated and carry a significant risk of malreduction. Early in my practice, I rarely exposed the syndesmosis, instead relying on a large clamp and percutaneous screw fixation. Looking back, I can't believe I ever did that! Over time, I've been able to create a treatment algorithm that I've found to be very reliable, with great results.

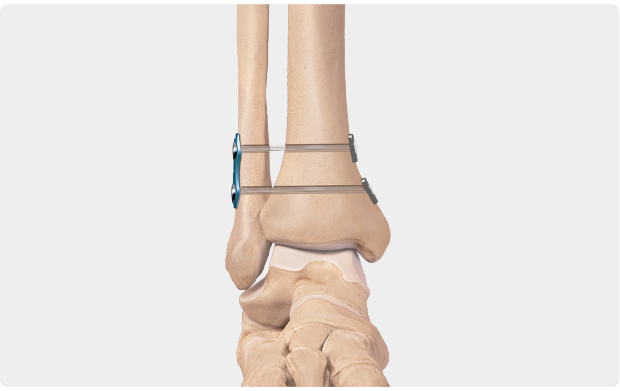
In general, preoperative CT scans have been very helpful for me to look at where the fibula is with respect to the incisura and to look for a posterior malleolar fracture. Also, arthroscopy/Nano arthroscopy can be a great tool to look at the injured structures and help with the reduction. Be sure to make the scope portion quick, or don't use a pump, as there are case reports of extravasation and potential compartment syndrome.

While there is no definitive literature on the optimal fixation level for the fibula, my typical approach is to fix up to approximately two-thirds of its length. I still don't fix fibula neck fractures, but I would have no problem fixing a fibula fracture halfway up the leg. The nice part about achieving rigid, stable fixation is that you have now helped create an anatomic reduction of the fibula distally in the incisura and obtained the proper length and rotation of the fibula as well. Once the fibula is fixed, you can use 1 or 2 TightRope® implants. I like to place the TightRope XP implants about 1.5-2.0 cm above the joint.

If you don't fix the fibula more proximally, you have to be very vigilant about a proper reduction of the fibula in the incisura. I routinely open these injuries up and either extend the lateral ankle arthroscopy portal more proximally or make an incision anteriorly-laterally, where the talus, fibula, and tibia meet. When looking at these 3 bones, you can really dial in an anatomic reduction. It's important for the lateral tibia to almost touch the medial fibula—any diastasis there is typically a sign of a malreduction. Speaking of malreduction, most of these injuries do not require extreme, forceful clamping. If you're using excessive force to get a good fluoroscopic reduction, the injury may be malreduced.

When the fibula length is stable, I like to use a TightRope® implant with the *Internal*Brace™ ligament augmentation procedure for reconstruction of the AITFL. I use this construct because it provides excellent "time zero" stability and restraint against any external rotation. If you're concerned about length, use the open technique mentioned above and then place a 2.0 mm Steinmann pin across the fibula and tibia to hold the length. Use a TightRope implant to help fine-tune the reduction into the incisura, and then, a 4-cortex 3.5 or 4.0 mm solid screw to help hold the fibula out to length.

In almost all cases of Maisonneuve injuries, there is a medial deltoid injury or medial malleolus fracture. If there is a deltoid injury, I'll make a medial arthrotomy and use 1 or 2 Knotless FiberTak® anchors off the distal anterior medial malleolus. This helps reduce the medial clear space and is usually the last step for me.



Closing Pearls

- Don't ignore the fibula fracture; you don't have to fix them all, but it must be close to perfect (consider even opening, reducing. and clamping)
- Don't follow just the x-rays/fluoroscopy—an ideal option is to open the syndesmosis at the joint and make sure you have it reduced
- Don't ignore the medial side; fix the deltoid if there's no medial malleolar fracture—it is universally torn. Scope it if you don't believe me!

Reference

1. Stufkens SA, van den Bekerom MP, Doornberg JN, van Dijk CN, Kloen P. Evidence-based treatment of maisonneuve fractures. *J Foot Ankle Surg*. 2011;50(1):62-67. doi:10.1053/j.jfas.2010.08.017

Deep Dive

Maisonneuve Fractures Repair Technique: Tips and Pearls (Part 2)

Norman E. Waldrop III, MD

Maisonneuve fractures result from eversion and external rotation forces applied to the ankle. This injury typically involves a proximal fibular fracture, disruption of the syndesmosis laterally, and injury to the deltoid ligament medially. In some cases, instead of a deltoid ligament tear, a medial malleolar fracture may be present. Often, these injuries are misdiagnosed or missed altogether. Clinically, patients present with severe ankle pain and difficulty bearing weight. Swelling and bruising are typically located at the level of the ankle, and often, there is minimal pain around the fracture site proximally. These patients often present with difficulty ambulating.

While Maisonneuve fractures make up a relatively small percentage of ankle injuries, it is important to keep them in mind when examining the ankle, especially in a patient who has an unusual mechanism of injury. When evaluating a patient with a Maisonneuve injury, I always stress the ankle under fluoroscopy. The instability at the ankle can easily be evaluated with stress examination. If fluoroscopy is not available, stress radiographs in conjunction with physical examination can give very accurate information with regard to ankle stability. If available, weight-bearing CT scan can be another valuable tool to assess the stability of the ankle and position of the fibula within the ankle complex.

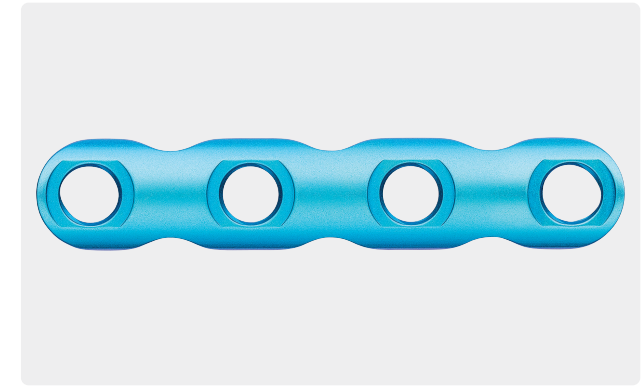
In patients with an unstable Maisonneuve fracture, I typically address the lateral side first. In patients who have a very proximal fracture, it is uncommon for the fracture to be fixed. As a result, this is the one situation where I use a screw in my fixation construct. I will use a 4-hole, lateral plate, and under fluoroscopic guidance, place a 4-hole ⅓ tubular plate and secure it to the bone with 14 mm screws on each end of the plate. With this done, I often will use a periarticular clamp to reduce the syndesmosis. Once reduced and in good position on fluoroscopy, I will place a TightRope® implant for syndesmosis stabilization, and then a quadricortical syndesmosis screw, tightening only to hand-tight. Finally, I will further cinch down the TightRope implants to remove any residual laxity.

In Maisonneuve fractures, it is rare for only the lateral side to be injured. If the injury was violent enough to create a proximal fibula fracture and syndesmosis instability, the deltoid is involved. I have a VERY low threshold for the deltoid to be fixed in these injuries. It is part of my preoperative plan in every one of these injuries. Typically, in this injury, I use a double-loaded SutureTak® anchor for primary repair of the deltoid, but occasionally, with more extensive involvement of the deltoid, I will use multiple Knotless FiberTak® anchors.

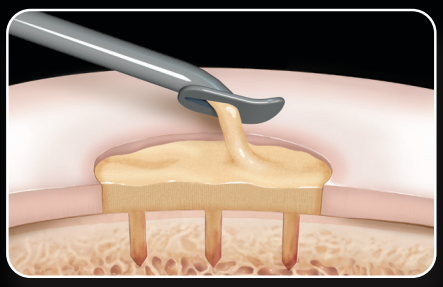
One of the important take-home points is to understand that due to the violent nature and extent of these injuries, it is critical to evaluate all parts of the joint. Arthroscopy is key for assessing and managing intra-articular damage, which is common with this injury. Early identification and treatment—especially of cartilage lesions—are critical for optimal outcomes.

My treatment for the high-caliber athlete who sustained this injury honestly does not change. This is a high-energy injury to the ankle and is often very unstable. It is uncommon to see an athlete with a Maisonneuve injury that does not require surgical stabilization. It is critical to assess all parts of the ankle when understanding the instability pattern. Most commonly, these injuries require intraoperative stress fluoroscopy, arthroscopy, lateral syndesmosis stabilization, and medial deltoid repair.

Typically, when repairing the syndesmosis in athletes with a Maisonneuve injury, I use a hybrid construct. I use a 4-hole, ⅓ tubular plate on the fibula. I secure it proximally and distally with a 14 mm cancellous screw. Once the plate is in the appropriate position, I place the TightRope® implant in the more proximal hole with the ankle reduced and stabilized using a periarticular C-clamp. Next, I place a quadricortical screw in the hole proximal to the TightRope implant. Once the ankle is stabilized with the screw, I again stress under fluoroscopy to ensure stability. The syndesmotic screw helps prevent fibular shortening, which is a risk in these length-unstable injuries. Once I see the proximal fibula is healing appropriately, I remove the screw and perform a TightRope exchange, leaving two TightRope implants to allow for appropriate motion at the joint while providing the stability needed for the ligaments to heal.

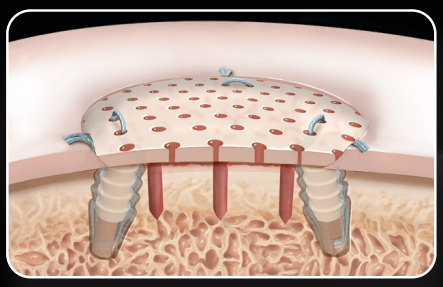


When You Treat Osteochondral Lesions . . . Think Arthrex.



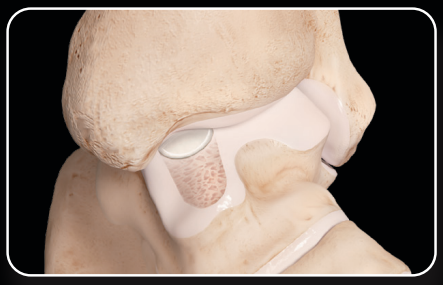
AutoCart™ Technique

Harness the benefits of autologous tissue with a cost-effective,[1] arthroscopic, single-stage procedure



Cartiform® Viable Osteochondral Allograft

A flexible osteochondral graft that easily matches any lesion size and contour

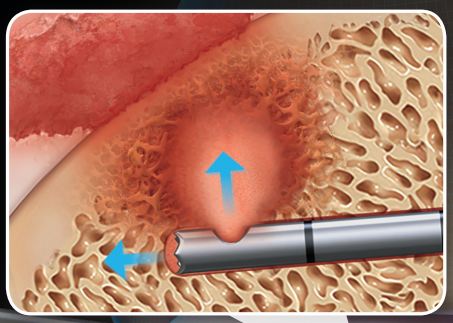


Autograft and Allograft Osteochondral Transplant (OATS® Systems)

Precise instrumentation to reproducibly recover and implant healthy articular cartilage to the talus

IntraOsseous BioPlasty® (IOBP®) Surgical Technique

A biologic treatment for subchondral bone marrow lesions, with AlloSync™ Pure and cPRP from BMA processed with the Angel® system to encourage bone remodeling and repair



Scientific and reimbursement information on JointPreservation.arthrex.com

Reference

1. de Windt TS, Sorel JC, Vonk LA, et al. Early health economic modelling of single-stage cartilage repair. Guiding implementation of technologies in regenerative medicine. *J Tissue Eng Regen Med*. 2017;11(10):2950-2959. doi:10.1002/term.2197

Arthrex®

What's in My Bag?

Talus Osteochondral Allograft Transplant System (Hemi-Talus OATS® Procedure)

Anish R. Kadakia, MD

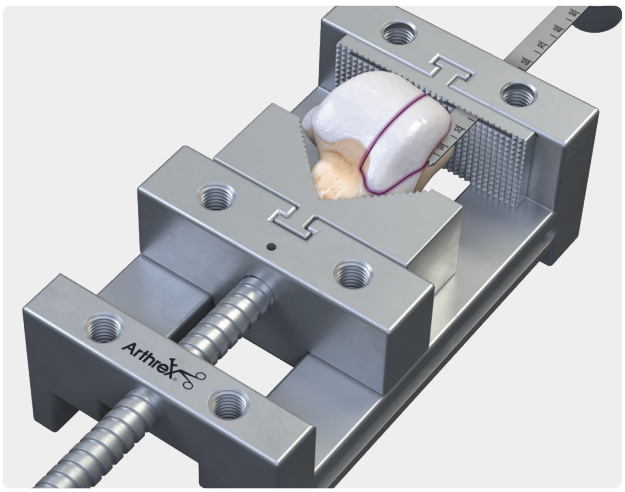
What is your rationale for doing an allograft OATS procedure vs microfracture in patients with chondral defects?

There are certain limitations when it comes to microfracture of talus defects. It usually results in type I collagen formation, which is mechanically inferior to type II cartilage. As a result, microfracture can lead to continued degeneration and poor long-term outcomes. Microfracture can only be used in smaller defects and is not recommended for larger defects or any involving the shoulder of the talus.

Osteochondral allografts are excellent for large defects. While fresh allografts show a slight decline in cell viability over time (1.7% at 14 days), Arthrex typically provides grafts within 15 days of recovery, ensuring high initial cell viability. You can also size-match the talar allografts, providing a precise fit for the defect.

What surgical approach do you prefer to use for this procedure?

I use an anterior approach as it is easier technically and provides excellent visualization and access for accurate graft placement. This avoids the need for a medial malleolar osteotomy and simplifies the procedure while also preserving future options for ankle replacement or fusion. This approach also allows for a more accurate press-fit of the allograft, ensuring correct height and alignment. I use a pin distractor to disengage the talus from the tibia, creating space to safely perform tibial saw cuts.



What tips do you have for initial marking and resection of the defect?

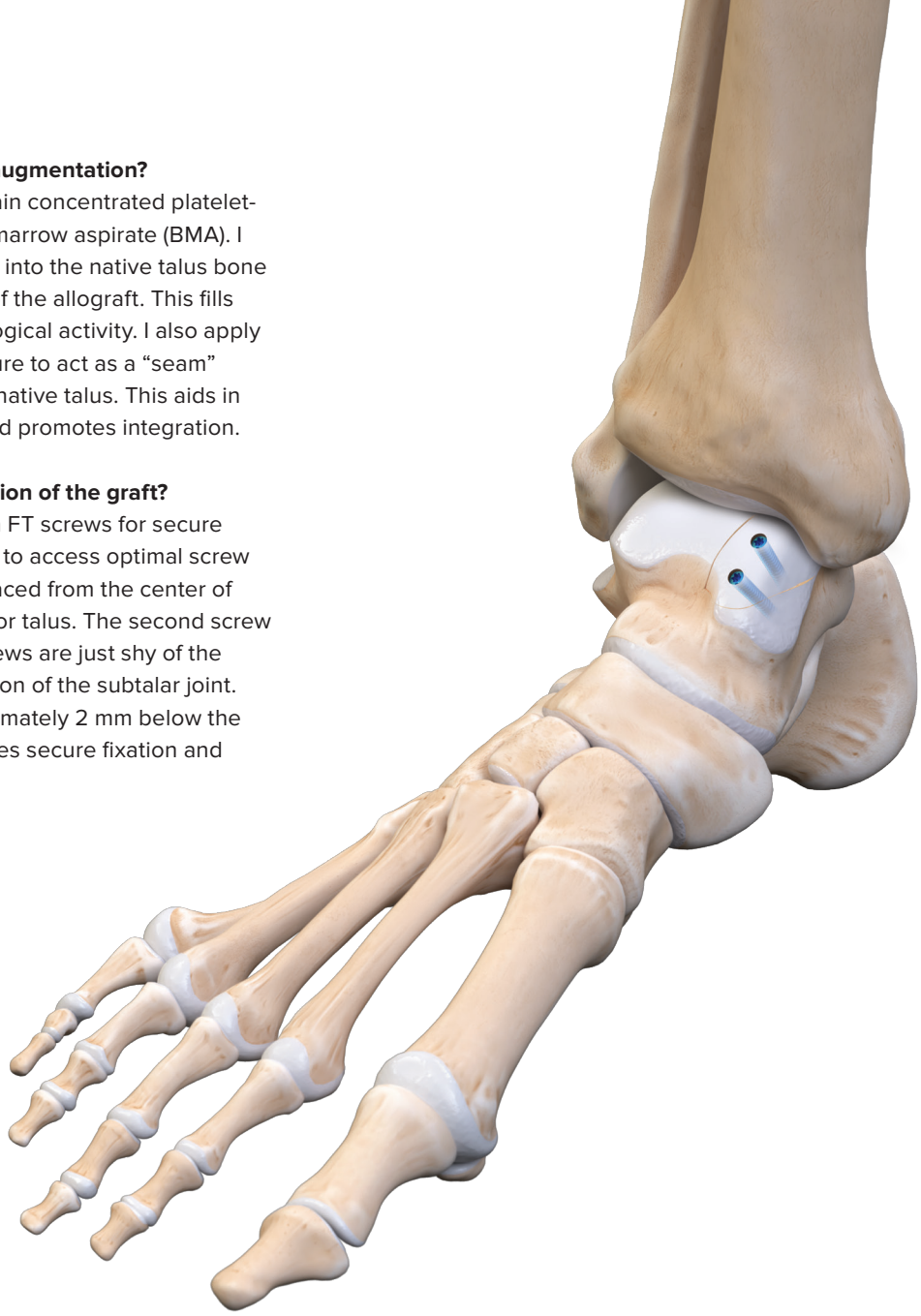
Place a small K-wire along the talar neck, extending from anterior to posterior, as a cut guide for the saw. This mimics the height and depth of the resection. Aim for approximately 1 cm height of resection at the dome of the talus. This ensures sufficient native talus remains for graft fixation and prevents the graft from collapsing or fragmenting. Position a Chandler distractor or a Freer elevator across the top of the tibia to protect it during the initial saw cuts. Use a narrow oscillating saw for the initial vertical cut anterior to posterior, adjacent to the K-wire, and finish with a small osteotome in order to establish the lateral to medial position. Next, to establish the dorsal to plantar height cut, begin by protecting the gutters with a Freer elevator. Take the oscillating saw down the length of the K-wire horizontally and extend fully posterior. Remove the talar defect and finish with a power rasp to smooth the resected surfaces.

What tips do you have for cutting the allograft?

The Arthrex Talus Allograft OATS workstation is crucial to ensure graft cut precision. Use the triangular side of the holder on the native lateral process and the flat side on the medial side. Place a K-wire from anterior to posterior on the allograft's talar neck to mimic the height of the resected native talus to help with measuring and cutting the graft. Before finishing the final cut to obtain the correct width (vertical cut), secure the allograft to the remaining allograft block. This prevents it from becoming loose or flying off during the cut. Insert a K-wire from dorsal to plantar into the talar body of the resected allograft aspect (it's still connected mediolaterally). Insert another K-wire from anterior to posterior to serve as a working handle for the graft, providing a secure grip. Make sure to measure 1 mm more than the previously measured native defect width to account for the width of the saw blade. Once the cut is complete, the allograft will still be somewhat secured by the dorsal-plantar K-wire. Remove the dorsal-plantar K-wire. The graft will now be loose. Maintain hold of the allograft using the anterior-posterior K-wire handle.

Do you use any biologics for augmentation?
I use the Angel® system to obtain concentrated platelet-rich plasma (cPRP) from bone marrow aspirate (BMA). I typically inject cPRP from BMA into the native talus bone and into the cancellous bone of the allograft. This fills the spaces and enhances biological activity. I also apply a small amount of AlloSync™ Pure to act as a "seam" between the allograft and the native talus. This aids in filling any microscopic gaps and promotes integration.

What do you use for final fixation of the graft?
I use two 2.5 mm Compression FT screws for secure fixation. I plantar flex the ankle to access optimal screw trajectory. The first screw is placed from the center of the talar dome into the posterior talus. The second screw more anterior. I ensure the screws are just shy of the inferior aspect, avoiding violation of the subtalar joint. I bury the screw heads approximately 2 mm below the subchondral bone. This provides secure fixation and prevents soft-tissue irritation.



Feature Article

DualCompression Tibiotalocalcaneal (TTC) Intramedullary Nail: A Design Surgeon's Perspective

Robert Gorsline, MD

Severe foot and ankle deformities are complex and challenging cases in which surgeons must toe the line of correcting the deformity while maintaining or improving functional usage of the affected limb. Various disease states can contribute to the formation of such anomalies, leading to diverse clinical presentations that require a tailored approach to treatment. TTC fusion is an approach that can produce excellent results in the appropriate patients but is limited by long recovery times and the potential for complications due to nail failure. The highly anticipated DualCompression Hindfoot Fusion Nail Implant System offers potentially shortened times to weight-bearing, improved long-term viability through its precision engineering, and sustained compression through nitinol technology.

A stainless-steel cable and compression device applies simultaneous axial compression on both joints through the center axis of the nail, while its superelastic nitinol inner core provides up to 10 mm of intraoperative and sustained dynamic compression across both joints.[1] This allows a response unique to each patient's healing environment and an active response to bone resorption or joint settling.

This system is intended to facilitate tibiotalocalcaneal arthrodesis to treat severe foot and ankle deformities, arthritis, instability, and skeletal defects after tumor resection, including neuro-osteoarthropathy (Charcot's foot), avascular necrosis of the talus, failed joint replacement, failed ankle fusion, osteoarthritis, pseudoarthrosis, and rheumatoid arthritis. Implantation should feel as familiar as with a TTC nail but offers a unique mechanism and degree of internal compression. Good compression leads to stability and long-term viability of the construct for a lasting treatment outcome.

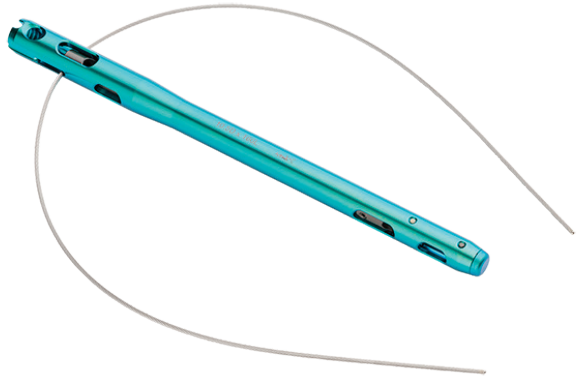
What limitations have you observed with TTC nails currently on the market?
It's the minimal compression. Few nails on the market have internal compression systems and they only provide very limited compression. I've used the Integra™ PANTA® nail. It has inherent flaws, which led me to design the cable system in the DualCompression hindfoot nail.

So, the most significant answer is compression, in what's limited. The DualCompression hindfoot nail solves this limitation very well.

Why would you choose to use the DualCompression hindfoot nail over other products on the market?
Compression over time is a very interesting concept. This is what will create inherent stability. We know that from lagging fibula fractures. The more compression you can get, and the longer it can last, the more you get incredible stability of the construct. The most notable advantage of the nail is significantly more compression at the start and dynamic compression over time.

What are your top three tips and pearls for a successful case and outcome?

- Deformity correction—If you are not getting the deformity corrected, you are not doing it right. That has a lot of challenges there, depending on the scenario.
- Addressing bone loss—Knowing what you will use to fill a void, whether it is a metal cage or allograft.
- Construct rigidity—This is a system that achieves a really rigid construct and is vastly superior to other available products.



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.

Do you have any specific pearls that would be helpful for surgeons to know beforehand?
The important thing is to understand the internal mechanism. Once you know the internal mechanism, you understand why all the different slots are numbered the way they are, putting the cables in correctly, etc. All surgeons should familiarize themselves with this as they pursue using the system.

Also, trust your scrub tech to assemble the jig correctly. It is no longer than a 15-second process. It is pretty slick. Outside of that, it is like any other nail, which is the beauty of it. Once you familiarize yourself with it, you are going to twist this handle and say to yourself, “Wow, what did it do? How is it that easy?”

Any final comments about the system as a whole?
The engineering within this nail is of epic proportions; it just blows everything else out of the water.

The DualCompression Hindfoot Fusion Nail Implant System is functional, is easy to use, offers precision engineering in a simple and elegant form, and provides increased compression for construct stability.

Reference

1. Arthrex, Inc. Data on file (APT-04782G). Naples, FL; 2020.

Foot & Ankle Medical Education

Course Schedule

Upcoming Medical Education Events

Date	Course Name	Location
2025		
September 22	Foot & Ankle Minimally Invasive Surgery Course	Naples, FL
October 17	Foot & Ankle Minimally Invasive Surgery Course	Naples, FL
October 31–November 1	Controversies in Foot and Ankle Surgery	Naples, FL
November 17	Foot & Ankle Minimally Invasive Surgery Course	Naples, FL
December 12-13	Women in Foot and Ankle Surgery	Naples, FL
2026		
January 9-10	East Coast Foot and Ankle Summit	Naples, FL
January 23	Western Foot and Ankle Minimally Invasive Sugery Course	Englewood, CO
January 24	Western Foot and Ankle Minimally Invasive Sugery Course	Englewood, CO
February 9	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
March 9	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
March 20-21	Foot and Ankle Team Physician Controversies	Naples, FL

Learn more about the Arthrex Medical Education Experience by following us on Instagram and LinkedIn

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Notes

The views expressed in this newsletter reflect the experience and opinions of the presenting surgeons and do not necessarily reflect those of Arthrex, Inc.

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.

Products may not be available in all markets because product availability is subject to the regulatory or medical practices in individual markets. Please contact your Arthrex representative if you have questions about availability of products in your area.

Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

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