Arthrex Presents:

Breakthroughs in Foot and Ankle Technology

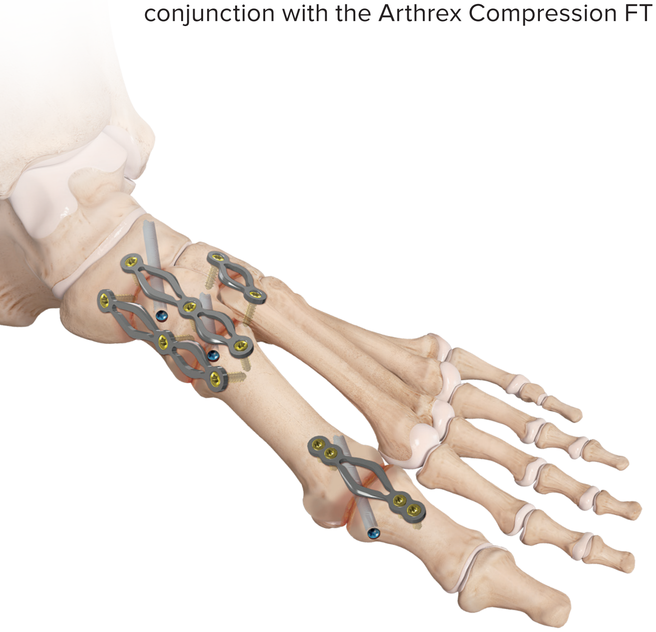
Summer 2021

Welcome to the ACFAS Annual Meeting. Arthrex remains committed to servicing all of your metal, soft-tissue, arthroscopic, and trauma solutions for foot and ankle pathologies. Following what has been an unexpected year for all, we look forward to seeing you back at the booth to meet our staff of product managers and engineers who are all here to help you experience what we can offer in support of our mission of Helping Surgeons Treat Their Patients Better™. Take special note of our recent innovations in forefoot technology with the launch of our MaxForce™ MTP Fusion Plating System as well as the continued expansion of our DynaNite® product line, featuring the DynaNite FlexWire and DynaNite Compression Plating System. Information on courses is listed on our website. Stay safe and have a great meeting!

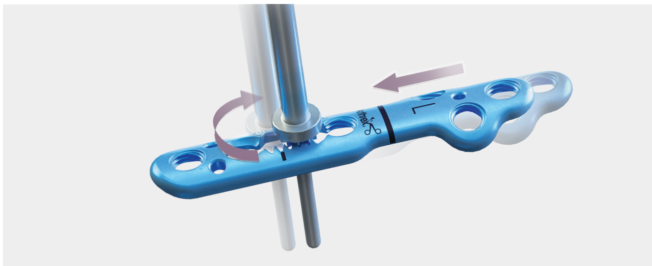
Pete Denove
Senior Director, Product Management
Distal Extremities and Trauma

DynaNite Compression Plates

The DynaNite nitinol compression plates use the superelastic principles of nitinol to create dynamic compression across a fusion site. Each plate comes packaged in a compression device that narrows the bridge and lengthens the plate. When the compression device is removed, the bridge is allowed to widen to its manufactured state. The plate is fixated with screws so that as it widens and shortens, it naturally creates compression across the fusion site. The DynaNite Nitinol Compression Plates are intended to be used in conjunction with the Arthrex Compression FT Screws.



MaxForce MTP Plate



The MaxForce MTP plates allow for maximized compression of the arthrodesis site via two modes of compression. In addition to a standard oblong compression hole with eccentric drilling, these plates use a unique mechanism that allows surgeons to manually dial in compression across the joint. Together, these two modes allow for up to 34 lb of combined compression.[1] The teeth in the plate align with the teeth on the compression device to work like gears. As the compression device is turned clockwise, the plate shifts proximally, compressing the MTP joint.

Reference

1. Arthrex, Inc. Data on file (APT-04668). Naples, FL; 2020.

What's in My Bag?

*Internal*Brace™ Ligament Augmentation Repair

Sid Sharma, DPM

There is increasing evidence that chronic ankle instability is being undertreated in many foot and ankle centers using existing treatment protocols. Traditionally, a standard modified Brostrom procedure is performed to repair the chronically attenuated lateral collateral ligament. This technique repairs the actual ligament but doesn't meet the goal of returning the ligamentous strength and stability to the lateral ankle.[1]

There needs to be a paradigm shift in our thinking to address the root cause of patients' complaints, which instability of the ankle. Once stability is restored, patients can safely enter an accelerated rehab protocol to allow an earlier return to preoperative activity levels.[2-4]

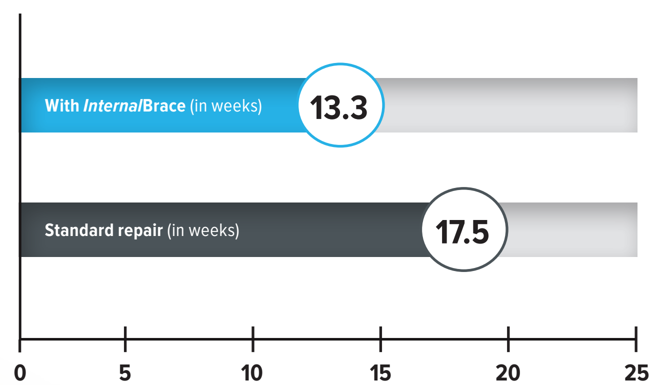
The 2018 FAI retrospective study by Coetzee et al demonstrated supportive data with clinical outcome evidence of Arthrex's *Internal*Brace ligament repair procedure. This study presented results, proving that patients can begin to rehab quickly while the *Internal*Brace technique reinforces the primary repair throughout the healing process.[4] Some patients even returned to their pre-existing activity level as quickly as 8 weeks post-op.[4] The results of this study were consistent with my patient outcomes during this time period.

The need for lateral ankle augmentation with the *Internal*Brace surgical technique is further validated by the recent study in *FAI*. This prospective, randomized and multicenter study compared the traditional modified Brostrom versus modified Brostrom combined with *Internal*Brace augmentation. Return to preoperative activity level was 4.2 weeks earlier with *Internal*Brace augmentation.[2] These results suggest that patients with the *Internal*Brace ligament repair procedure may undergo an accelerated rehab protocol.

References

1. Viens NA, Wijdicks CA, Campbell KJ, Laprade RF, Clanton TO. Anterior talofibular ligament ruptures, part 1: biomechanical comparison of augmented Broström repair techniques with the intact anterior talofibular ligament. *Am J Sports Med*.2014;42(2):405-411. doi:10.1177/0363546513510141
2. Kulwin R, Watson TS, Rigby R, Coetzee JC, Vora A. Traditional Modified Broström vs Suture Tape Ligament Augmentation. *Foot Ankle Int*. 2021. doi:10.1177/1071100720976071
3. Martin KD, Andres NN, Robinson WH. Suture Tape Augmented Broström Procedure and Early Accelerated Rehabilitation. *Foot Ankle Int*. 2021;42(2):145-150. doi:10.1177/1071100720959015
4. Coetzee JC, Ellington JK, Ronan JA, Stone RM. Functional results of open Broström ankle ligament repair augmented with a suture tape. *Foot Ankle Int*. 2018;39(3):304-310. doi:10.1177/1071100717742363

Return to Pre-injury Level of Play[2]



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.

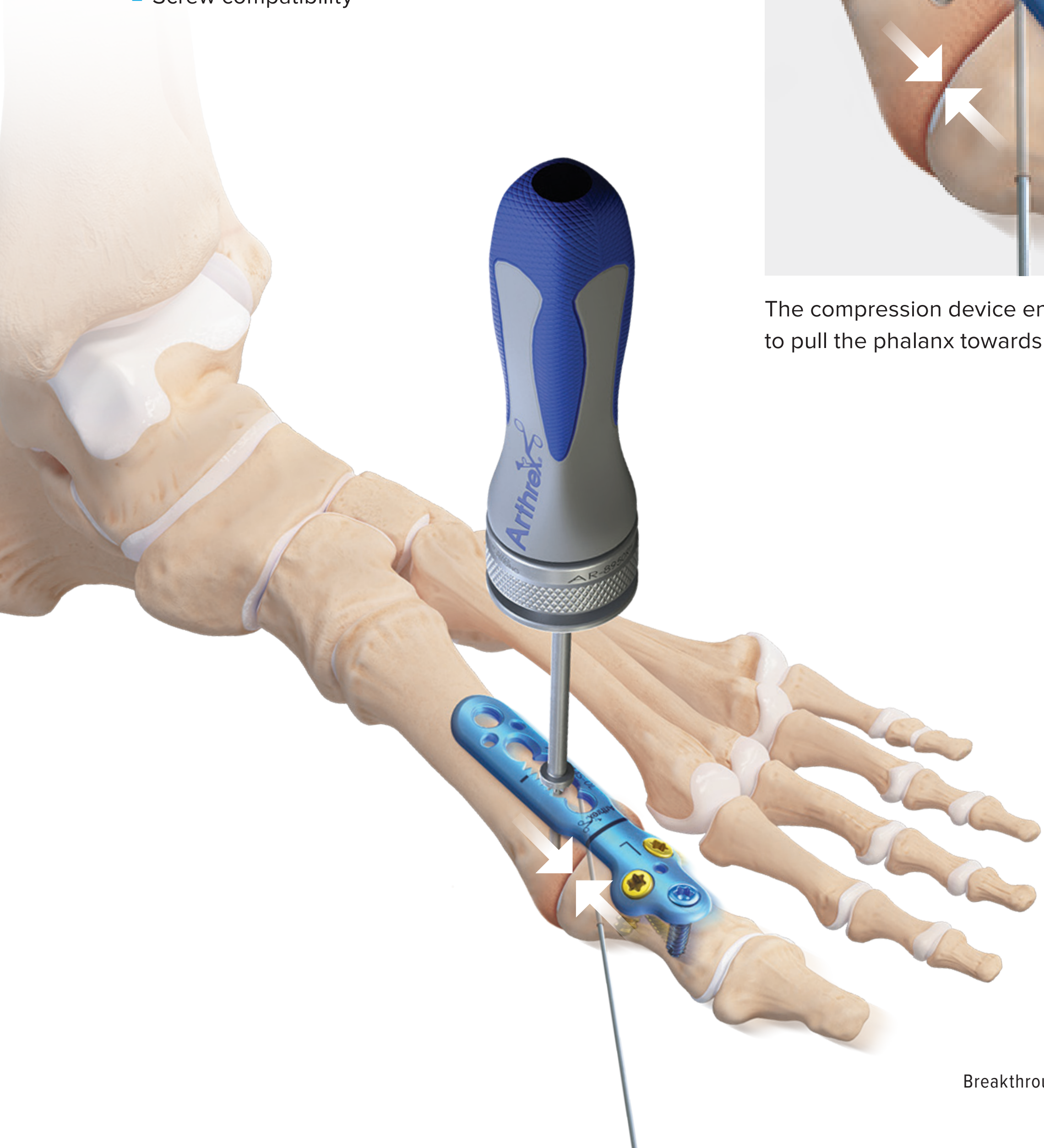
*Internal*Brace is intended only to support the primary repair and is not intended as a replacement for the standard of care using biologic augmentation in a primary repair. *Internal*Brace is intended only for soft-tissue-to-bone fixation and is not cleared for bone-to-bone fixation.

New Product Highlight

MaxForce™ MTP Fusion Plates

- Patented, geared compression mechanism lets you dial in compression
- New zero-profile, flat-head cortical screws
- Multiple angle and length options
- 3.0 mm and 3.0 mm/3.5 mm hybrid screw options for bone density variation
- Variable-ankle locking with a 30° cone of variability
- Plate options
- Screw compatibility

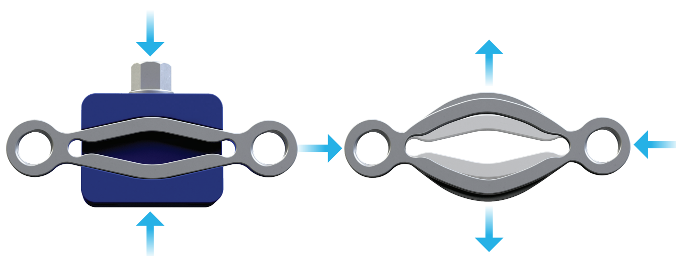
The compression device engages the geared mechanism to pull the phalanx towards the metatarsal.



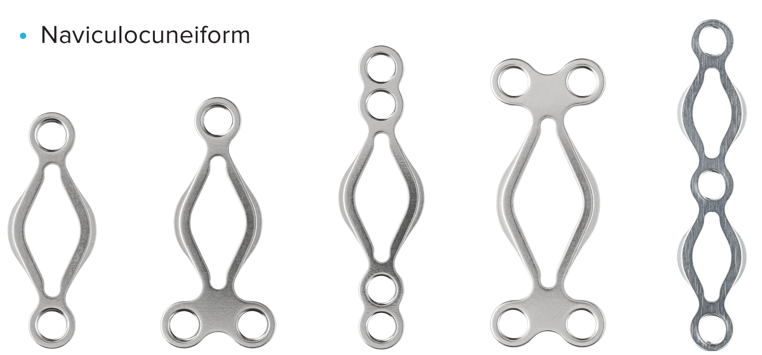
New Product Highlight

DynaNite® Compression Plates

The DynaNite nitinol compression plates use the superelastic principles of nitinol to create dynamic compression across a fusion site. Once the plate has been placed and fixated, and the compression device is removed, the bridge is allowed to widen to its manufactured state. As the plate widens and shortens, it naturally creates compression across the fusion site. The DynaNite Nitinol Compression Plates are intended to be used in conjunction with the Arthrex Compression FT Screws.



- Compatible with both 3.0 mm and 3.0 mm/3.5 mm hybrid VAL and KreuLock™ locking compression screws
- Available in multiple sizes and configurations for a number of arthrodesis applications:
  - 1st MTP
  - Lapidus
  - 2nd TMT
  - 3rd TMT
  - Calcaneocuboid
  - Talonavicular
  - Multi-segment
  - Naviculocuneiform



What's in My Bag?

DynaNite® FlexWire

Steven Douthett, DPM

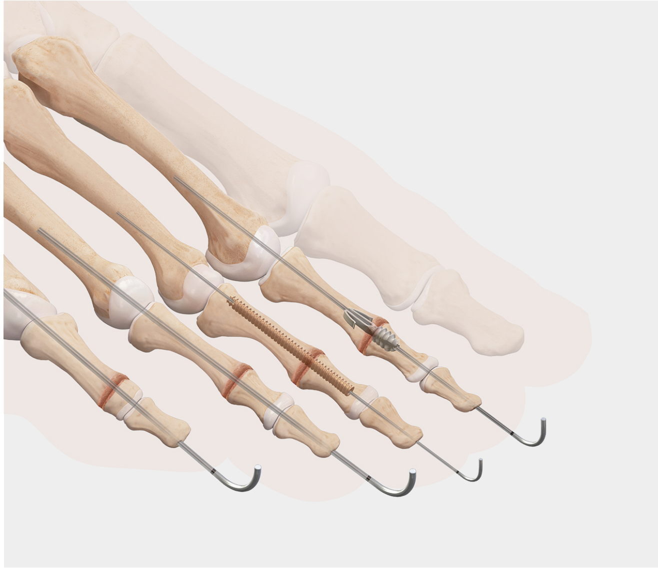
What key features do you like about the DynaNite FlexWires for hammertoe correction?

The superelasticity gives me confidence of increased durability and I like having the ability to pin across the MTPJ for added correction. Additionally, motion is still possible at the MTPJ, which allows for a more normal gait postoperatively. I regularly use the smaller diameter DynaNite FlexWire in conjunction with the DynaNite PIP implant. The 1.1 mm diameter of the wire fits through the canal of the hammertoe implant and can be advanced across the MTPJ for added stability.

Compared to using stainless steel K-wires, how does the FlexWire perform for hammertoe correction?

Since switching to DynaNite FlexWires I have noticed an increased wire retention as the body does not seem to be rejecting the wire as readily as I have seen with stainless steel wires. Also, to date, I have not had a DynaNite FlexWire break at the MTPJ after pinning the joint.

I like to use the DynaNite PIP implant or 2.5 Micro Compression FT™ screws for arthrodesis cases, as these are the most inherently stable implants. I can also use these implants in conjunction with the appropriately sized DynaNite FlexWire if I want to pin across the MTPJ for increased stability. I will pin across the joint after doing an extensor lengthening or tenotomy to allow the joint to heal into a rectus position. I have used DynaNite FlexWires as my only fixation for my digital arthroplasty cases or in facilities where implant cost is a limiting factor. Even when the joint does not achieve a solid bony union, a solid fibrous union affords a similar result.

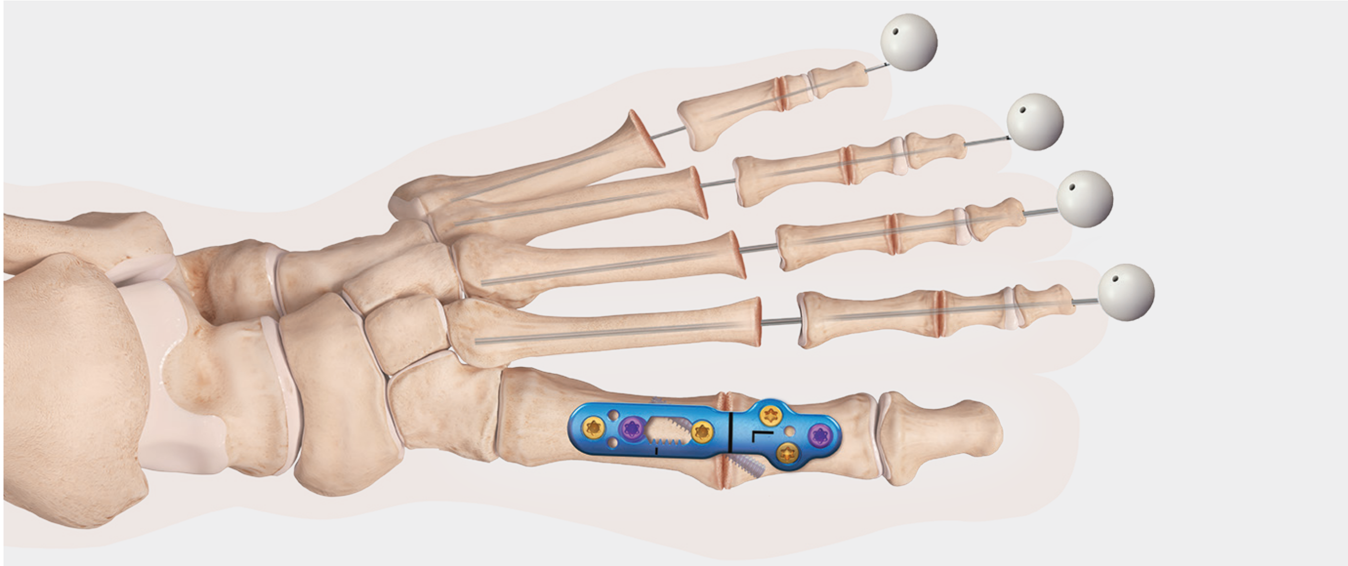


What other applications have you used the FlexWire outside of hammertoe correction?

I use the DynaNite FlexWire for a variety of applications and always have it on standby for bailout situations. I have also used the FlexWires to stabilize the lesser MTPJs in rheumatoid reconstruction.

What's in My Bag?

DynaNite® FlexWire (Cont.)



Can you explain your thought process on using the DynaNite FlexWire for rheumatoid arthritis patients and how it has performed?

I thought DynaNite FlexWires would be a perfect fit for my rheumatoid reconstruction cases. The ability to flex the wire makes it easy to guide it into the metatarsal diaphysis. Also, I have less concern about the bend of the wire causing weakening or breakage. The DynaNite FlexWires have performed great in my RA patients.

For rheumatoid reconstructions, I like to fuse the 1st MTP using the MaxForce MTP Fusion Plating System, and I typically resect the lesser metatarsal heads. I use the 1.6 mm DynaNite FlexWires to pin digits 2-4, and oftentimes 5, into the metatarsal diaphysis. This allows for the digits to scar into place and the DynaNite wires allow for early mobility. I have confidence the wires will hold correction with weight-bearing at postoperative week 2. I try to leave my DynaNite FlexWires in until postoperative week 5 or 6. I have had no issues with wire rejection, wire breakage, or pin tract infections to date.

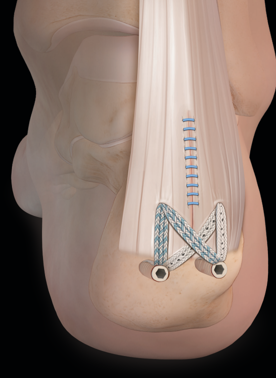
What is your postoperative protocol when using the DynaNite FlexWire? Have you noticed any improved patient satisfaction rates since starting to use this implant?

My postoperative protocol with DynaNite FlexWires is procedure-specific. For rheumatoid reconstruction, I typically have the patient non–weight-bearing in a splint for 7 to 10 days to control swelling. After that, I allow weight-bearing in a post-op shoe and leave the FlexWires in for 5 to 6 weeks.

As far as patient satisfaction with the implants, patients weight bear sooner after rheumatoid reconstruction and they are definitely happier. My hammertoe patients seem to be weight-bearing more comfortably with the MTPJ pinned versus a standard K-wire.

Technique Highlight

Insertional Achilles Repair



Postoperative rehabilitation for patients with surgical debridement and repair for insertional Achilles tendinopathy has been revolutionized with the use of the Arthrex Achilles SpeedBridge™ implant system.

Isolated anchor fixation cannot provide rigid tendon fixation and does not approximate the tendon to bone reliably. Thus, patients required extensive cast immobilization for 6 weeks followed by protected weight-bearing in a CAM walker boot for an additional 6 weeks to allow for tendon to bone healing prior to mobilization. This led to significant disuse atrophy and gastrocsoleus complex weakness that was very difficult to overcome during the later rehabilitation phases.

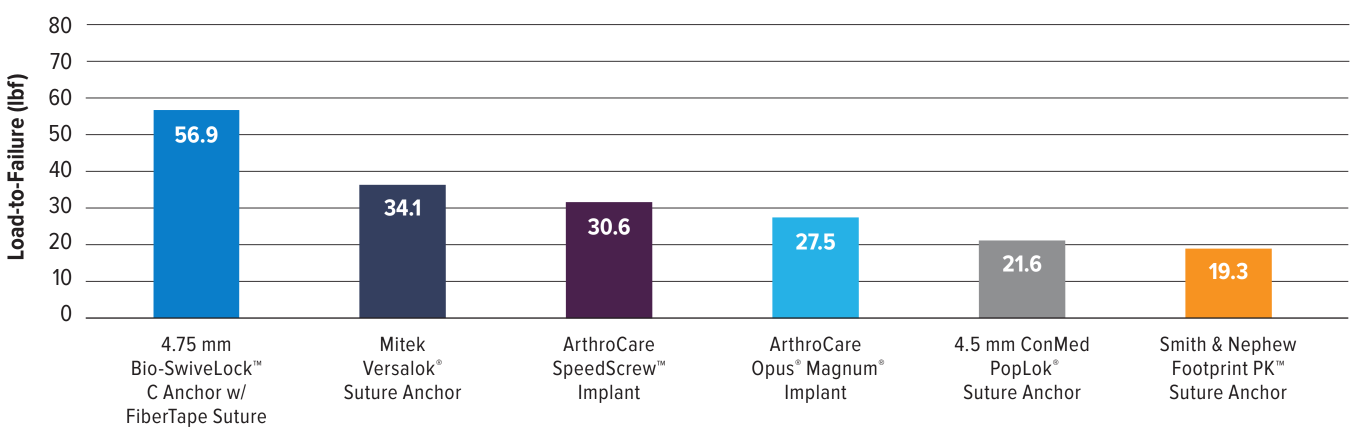
The Achilles SpeedBridge implant system provides rigid tendon fixation with improved tendon-to-bone opposition[1] such that immediate postoperative weight-bearing and range of motion are possible. The limiting factor in aggressive rehabilitation for most surgeons is wound healing. Once complete, early transition to regular footwear within 4 weeks is possible with initiation of physical therapy.

The lack of disuse atrophy together with early collagen healing with mobilization allows patients to recover quicker. Patients may resume normal activities of daily living at 2 months and return to sports and high-level activity reliably by 3 months whereas previous prolonged recoveries often necessitated 12 months prior to return to sports.

The Achilles SpeedBridge Implant System

The Achilles SpeedBridge implant system is a novel concept in Achilles reattachment following Haglund's debridement. This repair enables an hourglass pattern of FiberTape® suture to be laid over the tendon's distal end in a completely knotless 4-anchor configuration. The Achilles SpeedBridge repair provides rigid tendon fixation with improved tendon-to-bone opposition.[2]

Pull-Out Strength Comparison[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.

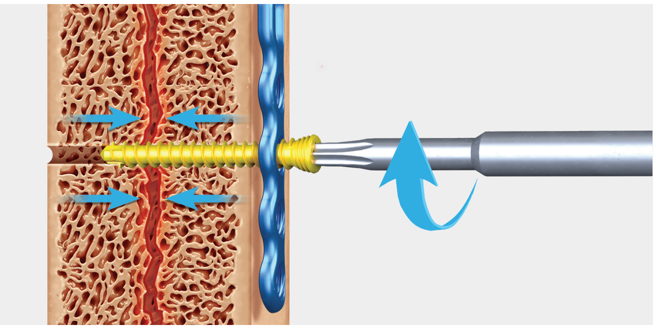
Reference

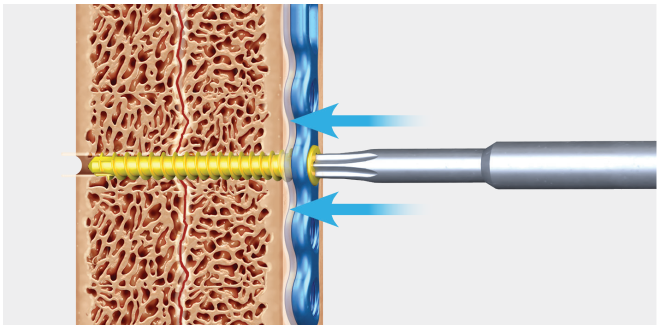
1. Rigby RB, Cottom JM, Vora A. Early weightbearing using Achilles suture bridge technique for insertional Achilles tendinosis: a review of 43 patients. *J Foot Ankle Surg.* 2013;52(5):575-9. doi:10.1053/j.jfas.2012.11.004.
2. Arthrex, Inc. Data on file (APT-01462, APT-00924, APT-01140).

New Product Highlight

KreuLock™ Locking Compression Screws

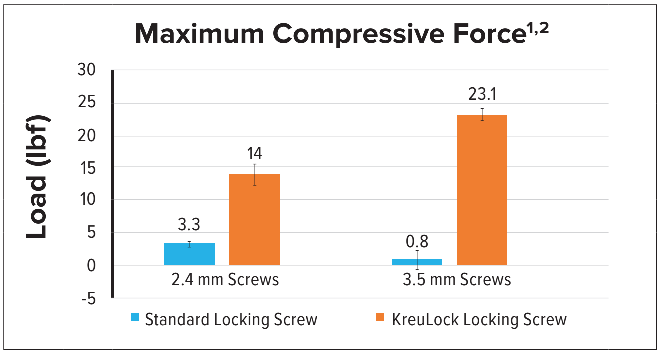
Arthrex is pleased to announce the launch of the new KreuLock locking compression screws. These innovative screws have the same proven variable-stepped thread pitch found in our Headless Compression FT screws and deliver up to 23 lb of compression.[1,2] They feature a locking head that mates with Arthrex foot, ankle, and trauma plates to create a low-profile construct.





Features and Benefits

- Compresses bone fragments and brings plate to bone.
- Saves time. In some cases may eliminate the need to use a nonlocking screw and later replace it with a locking screw.
- Offered in six different size families with size-specific instrumentation.
- Compatible with existing plating systems.
- Customizable universal tray can fit two caddies.



New Profile Drill

Size-specific and reusable, this instrument acts as a tapered countersink to prepare the near cortex for the tapered screw neck. A few turns by hand is the only additional step necessary for this new technology.

References

1. Arthrex, Inc. Data on file (APT-04100). Naples, FL; 2020.
2. Arthrex, Inc. Data on file (APT-04120). Naples, FL; 2020.

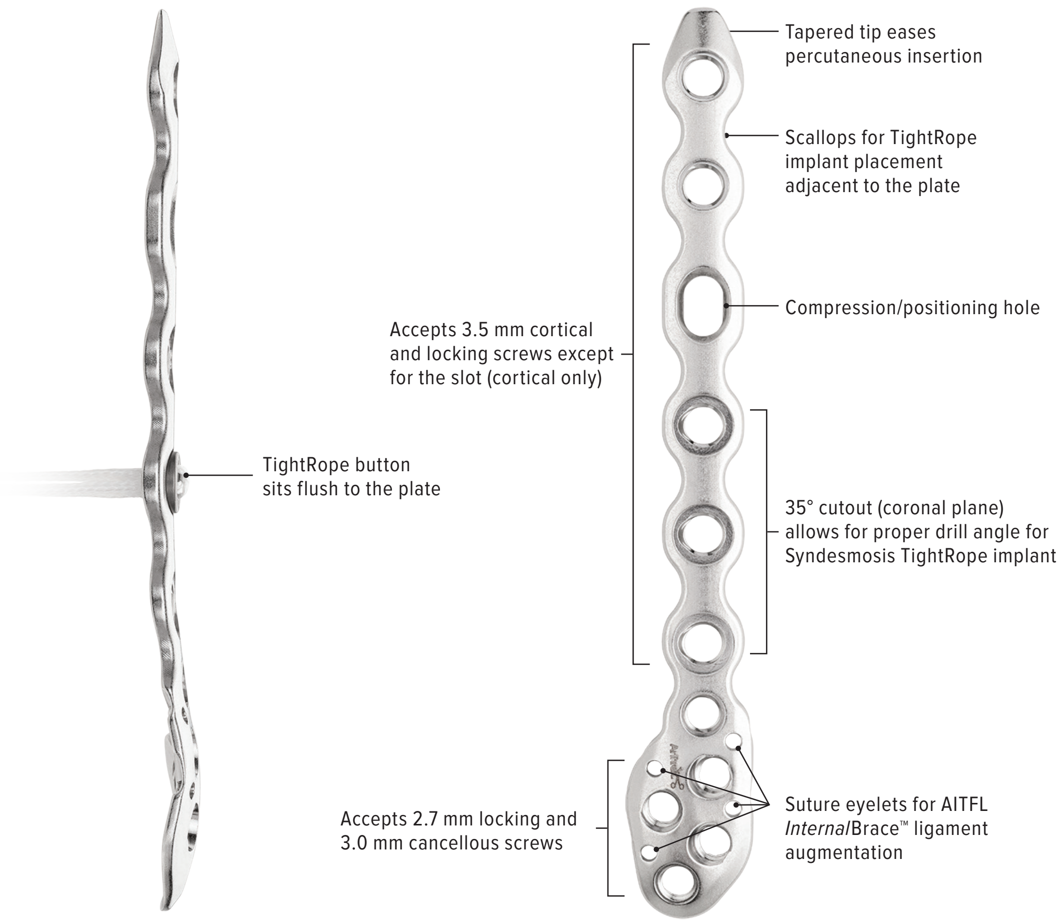
New Product Highlight

Locking Distal Fibula Plates for Ankle Fractures

Locking Distal Fibula Plates

Locking Distal Fibular Plates are designed for use in the most challenging lateral malleolus fractures. The distal portion or head of the plate thins and spreads to encompass a large portion of the lateral malleolus. The head accepts multiple 2.7 mm locking screws or 3 mm cancellous screws, making this plate ideal for patients with highly comminuted or distal lateral malleolus fractures.

Inclined, divergent fixed-angle locking screw holes distally allow for secure fixation. The shaft portion of the plate thickens to improve rigidity and strength[1], and the screw holes allow for multiple screw options. As with all of the fibular plates, there are recessed screw holes and a scalloped perimeter, allowing for easier contouring and placement of the Syndesmosis TightRope® implant through or outside the plate.



Low-profile tapered distal end to minimize soft-tissue irritation

Offered in **4, 5, 6,** and **8** holes and sterile in **10, 12,** and **14** holes

Reference

1. Arthrex, Inc. Data on file (APT-04849). Naples, FL; 2020.

New Product Highlight

MaxForce™ MTP Fusion Plate

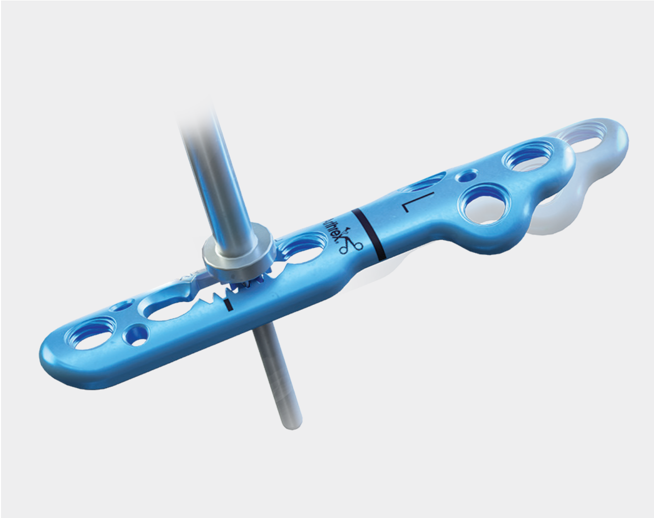
James Cottom, DPM

For new users, how would you describe the compression mechanism in the MaxForce MTP fusion plates? What advantages does this offer you?

The MaxForce plate uses new technology to increase compression forces across the fusion site by using two different modes of compression. There is a unique gear mechanism that pulls the hallux into the 1st metatarsal head. I usually will compress to two-finger tightness and place a BB-Tak in one of the proximal holes within the plate to maintain compression. This allows for manual “dialing” in of compression during the fusion. This unique compression option along with a standard compression hole within the plate allows for manual “dialing” in of additional compression during the fusion and a more stable construct.

How does the compression with this plate compare to other constructs you have used?

The ability to use the unique compression gear mechanism in the plate lets me fine tune and apply as much compression as I feel is clinically needed. This is important in those cases where the patient's bone quality may not be as robust. We can obtain the appropriate amount of compression to achieve our goal of a fusion in a simple, quick, and reproducible manner. In addition, laboratory studies demonstrated that we can obtain 24 lb of additional compression through the gear mechanism and an additional 9 lb by using the oblong hole in the proximal aspect of the plate.[1]



What other key features do you like about the new MaxForce MTP Fusion System?

The ease of use and implantation is one of the main reasons I have switched from my past plating technique to the MaxForce plating system. In addition, I like the fact that there are several options in regard to the size of the plate I need, depending on the patient. This system has a petite, standard, long, and extra-long plate in both 0 degrees of dorsiflexion/valgus and an option for 5 degrees of dorsiflexion and valgus. With all of these options, I have the ability to perform a primary fusion as well as revision fusions. Also, the fact that the plate sits flush with the prepared fusion site without having to contour the plate is an advantage. The plate also has a marker on the superior aspect that is used to align the plate properly on the joint. In addition, with the new KreuLock™ locking compression screws with a flat locking head allows for a zero-profile option for 1st MTP fusions when the screws are fully seated into the plate. This is especially important in those patients with less soft-tissue coverage because it reduces hardware prominence, which can be an issue with some other hardware options.

Reference

1. Arthrex, Inc. Data on file (APT-04668). Naples, FL; 2020.

New Product Highlight

MaxForce™ MTP Fusion Plate (Cont.)

Can you describe your technique and any tips/pearls you have found since starting to use the MaxForce MTP fusion plate?
After standard dissection and joint prep with cup and cone reamers, I will use bone marrow aspirate that I take from the calcaneus prior to tourniquet inflation and mixed with AlloSync™ Pure and place the mixture into the fusion site. Next, I will place a guide wire for a 3.5 mm Compression FT screw from the proximal medial base of the hallux and into the 1st metatarsal, but will not place the screw until the last step in the procedure. I place this screw last to allow compression through the compression mechanism in the plate.

The MaxForce plate is then applied to the dorsal aspect of the fusion site; the laser mark on the superior aspect of the plate is placed over the joint and BB-Taks are placed proximally and distally in the plate to provide temporary stabilization to the bone. Then the distal 3.0 mm variable-angled screws are placed in the plate. I do use the KreuLock™ flat-head screws to reduce any screw prominence and to compress the plate to the bone.

The compression drill sleeve is inserted into the proximal compression slot in the plate and a 2.0 mm drill is used to drill bicortically. Next, the compression driver is placed through the drill hole and I make sure it is fully seated into the plate while aligning up the laser marks on the driver and plate. Next, I remove the proximal BB-Tak and turn the driver clockwise to achieve compression.
I then place a 3.0 mm screw in the proximal compression slot and just before the head of the screw engages the plate, I will remove the proximal BB-Tak to allow for additional compression. Screws are then placed in the remaining holes within the plate as indicated. I then place an additional locking screw in the distal hole in the metatarsal to increase the stability of the construct. Finally, I place a 3.5 mm Compression FT screw is placed over the initial guidewire and perform a routine closure.

Technique Highlight

Minimally Invasive Bunion Correction

Noman A. Siddiqui, DPM

How has adopting MIS techniques changed your practice?

Adopting MIS techniques changed my practice in a number of ways, but mainly I have noticed improved patient satisfaction, partly due to a quicker return to normal shoes and activity. Additionally, I have seen a growth in my practice with patients seeking out an MIS correction. MIS techniques also work great for revisions. It is an excellent option because it does not require the surgeon to make another large open incision. Many issues can be corrected with small incisions.

What differences have you seen regarding patient-reported outcomes when comparing open to MIS bunion surgery?

We are in the process of collecting our outcomes for publication, but subjectively, there is vastly greater satisfaction with the MIS method compared to open procedures. Anecdotally, I have also noticed less narcotic use and an earlier transition to over-the-counter pain medications (within 1 to 2 weeks) compared to open methods. Overall, I have noticed my patients have high levels of satisfaction in the appearance of the foot and function of the joint.

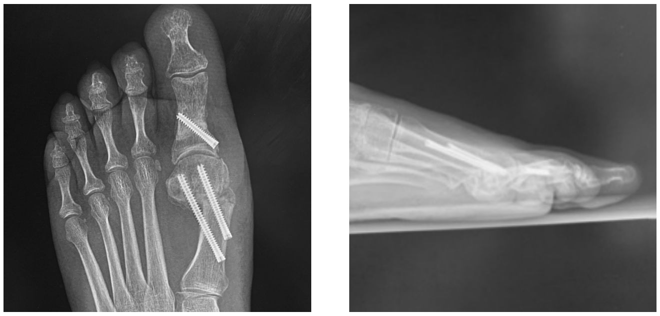
Can MIS bunion correction treat all levels of bunion severity?

Typically most bunion deformities can be corrected with an MIS approach. In my practice, I have not had to use an alternative open method for HAV correction in many years. Additionally, I have not had to perform a Lapidus procedure in at least 6 years since deciding to use MIS methods for all deformity correction. My colleagues and I published a radiographic review a couple of years ago that demonstrated correction in mild, moderate, and severe deformities.

What would you say to critics that advocate for Lapidus procedures in cases of hypermobility?

First, I would like to say that I do think hypermobility exists in the medial column. However, I do not think hypermobility can be isolated to a single joint such as the TMT. I do think the Lapidus procedure helps decrease this phenomenon and if one were to choose a TMT arthrodesis for HAV correction in the presence of hypermobility, it would be reasonable. However, in my experience a well-performed MIS bunion correction can decrease the need for a Lapidus procedure, and in my opinion the Lapidus procedure should be reserved for those individuals that demonstrate hypermobility with plantar TMT gapping.

Before



After

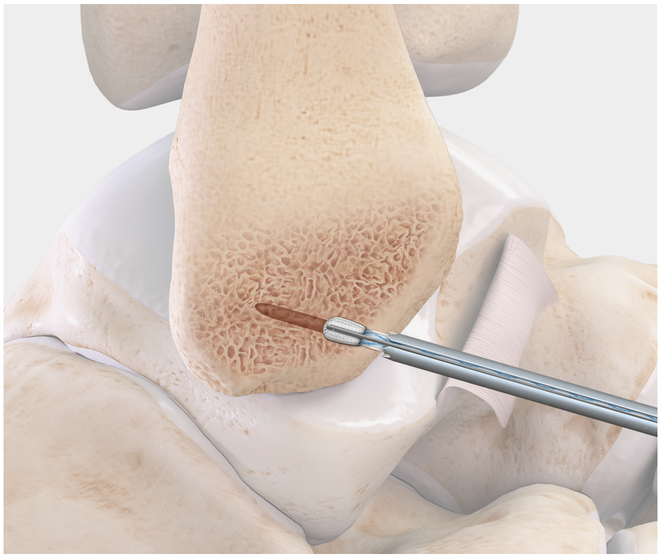
Reference

1. Siddiqui NA, LaPorta G, Walsh AL, Abraham JS, Beauregard S, Gdalevitch M. Radiographic outcomes of a percutaneous, reproducible distal metatarsal osteotomy for mild and moderate bunions: a multicenter study. *J Foot Ankle Surg.* 2019;58(6):1215-1222. doi:10.1053/j.jfas.2019.04.012

New Product Highlight

DX FiberTak® Suture Anchor Double-Loaded With 0.9 mm SutureTape

DX FiberTak Suture Anchor Double-Loaded With 0.9 mm SutureTape New!



Arthrex is excited to launch our third DX FiberTak anchor offering, the DX FiberTak suture anchor double-loaded with 0.9 mm SutureTape! This is an all-suture anchor double-loaded with 0.9 mm SutureTape, complemented by a guide delivery system, with both a 1.35 mm and 1.6 mm (for hard bone) drill to help minimize bone removal. SutureTape is a flat-braided suture that is stronger than FiberWire® suture and more resistant to tissue pull-through. It offers improved handling and stronger knot security with smaller comparable knot stacks. These anchors are ideal for any soft-tissue repair about the foot and ankle and maintain a very high pull-out strength considering the small profile of the anchor.[1,2] These anchors offer the benefits, clinical experience, and product support surgeons have come to appreciate from Arthrex.

Product Overview

- 15 mm anchor sheath
- Double-loaded with 0.9 mm SutureTape
- Needles attached
- 1.35 mm K-wire drill
- 1.6 mm K-wire drill (hard bone)
- 15 mm drill depth

Key Features and Benefits

- **Double Loaded** for versatility of points of fixation as well as suture configurations.
- **Minimal Bone Removal** – means less morbidity and more room for other anchors, including *Internal*Brace™ ligament augmentation repair for medial and lateral ankle ligament instability.
- **Tremendous Pull-Out Strength** – equivalent to 3.0 mm BioComposite SutureTak® anchor.[1,2] Surgeons can be confident in the ability of this anchor even though it has a smaller diameter.
- **Smaller Knot Stack**[3] – the coreless SutureTape suture allows surgeons to make tighter and smaller knots.
- **More Resistant to Tissue Tear-Through** – compared to standard FiberWire suture.[4]

References

1. Arthrex, Inc. Data on file (APT-03508). Naples, FL;2018.
2. Arthrex, Inc. Data on file (APT-03296). Naples, FL;2017.
3. Arthrex, Inc. Data on file (APT-03175). Naples, FL;2017.
4. Arthrex, Inc. Data on file (APT-02800). Naples, FL; 2018.

New Product Highlight

3.0 mm SutureTak With SutureTape Single- and Double-Loaded

3.0 mm SutureTak With SutureTape Single- and Double-Loaded New!

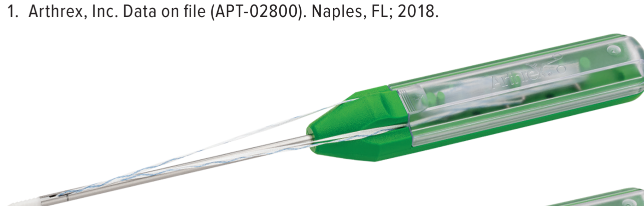
Arthrex is excited to launch the next generation of SutureTak anchors in the Distal Extremity portfolio. The 3.0 mm SutureTak anchor, one single-loaded with white/blue 1.3 mm SutureTape and the other double-loaded with one white/blue 0.9 mm SutureTape and one white 0.9 mm SutureTape. This unique family of "push-in" suture anchors allows for straightforward insertion and a flexible nonabrading suture eyelet. Predrill, mallet the anchor into place, and secure the soft tissues with the preloaded SutureTape with needles. These anchors are ideal for any soft-tissue repair about the foot and ankle and maintain a very high pull-out strength as well as the benefits, clinical experience, and product support surgeons have come to appreciate from Arthrex.

Advantages:

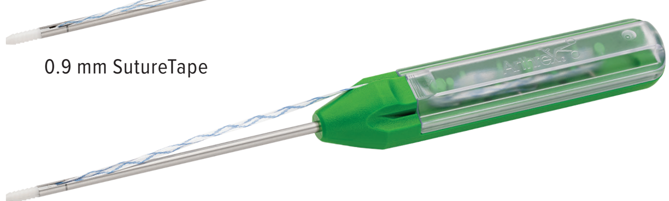
- **Excellent Cortical Purchase**
  With ridges along their entire length, these anchors provide exceptional pull-out in harder cortical bone
- **Minimized Suture Abrasion**
  The suture-on-suture eyelet interface avoids the type of wear that can occur between an anchor and suture
- **Preloaded With Two Needles and FiberWire® Suture**
  Providing excellent strength in a smaller size, this nonabsorbable, braided polyblend suture is preloaded for convenience
- **Straightforward Technique**
  Simple, shorter instrumentation and technique create a reliable and quick procedure
- **Proven Material**
  BioComposite SutureTak anchors are manufactured from PLDLA and ß-TCP (beta-tricalcium phosphate)
- **Smaller Knot Stack** – The coreless SutureTape suture allows surgeons to make tighter and smaller knots.
- **More Resistant to Tissue Tear-Through** – Compared to standard FiberWire suture.[1]

Reference

1. Arthrex, Inc. Data on file (APT-02800). Naples, FL; 2018.



0.9 mm SutureTape



1.3 mm SutureTape

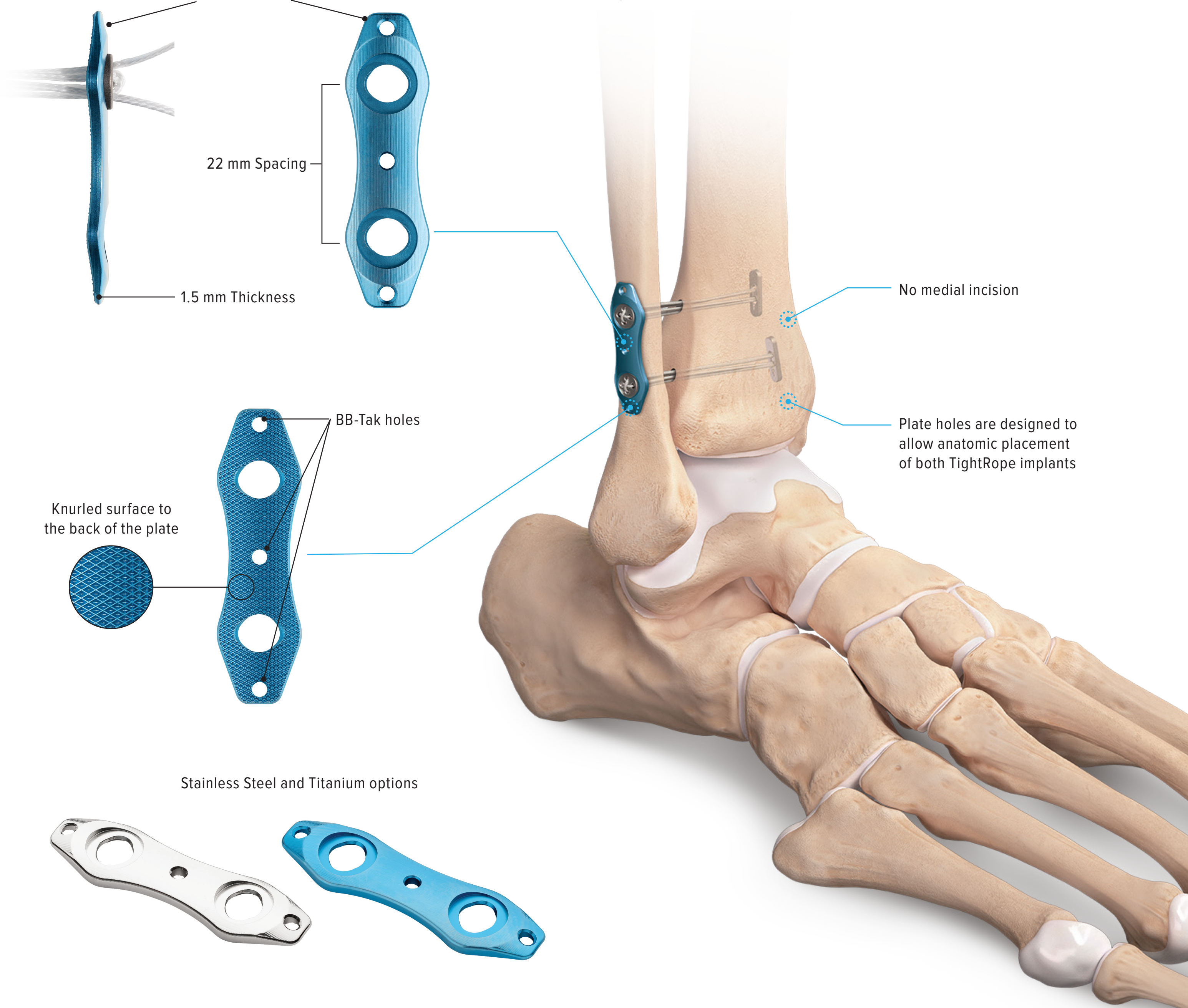
New Product Highlight

Syndesmosis TightRope® XP Buttress Plate

Now Featuring TightRope XP and 30% Lower Profile

New Plate Features:

The updated TightRope XP Buttress Plate Implant System features a newly designed, 30% thinner plate specifically designed for the treatment of syndesmotic injuries such as high-ankle sprains.



What's in My Bag?

KreuLock™ Locking Compression Screws

Michael Downey, DPM

What were your initial thoughts after using the new KreuLock Locking Compression Screws?

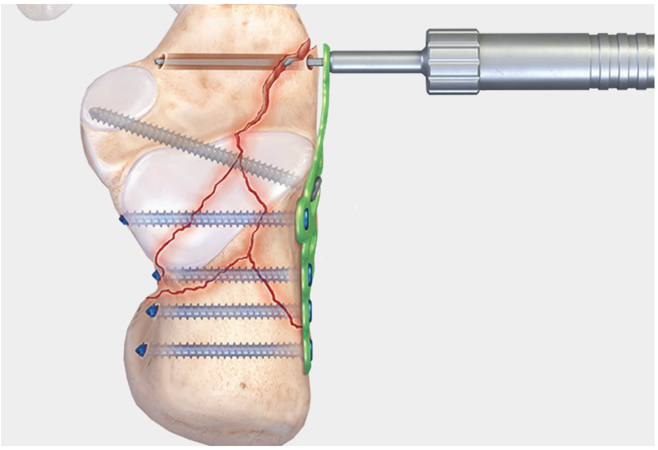
Initially, I was in disbelief. This screw eliminates unnecessary steps to achieve anatomical fixation and/or fusion. Not only does it compress the plate to bone but also locks into the plate at a variable angle, thus providing more security and stability to the overall construct with incredible ease of insertion.

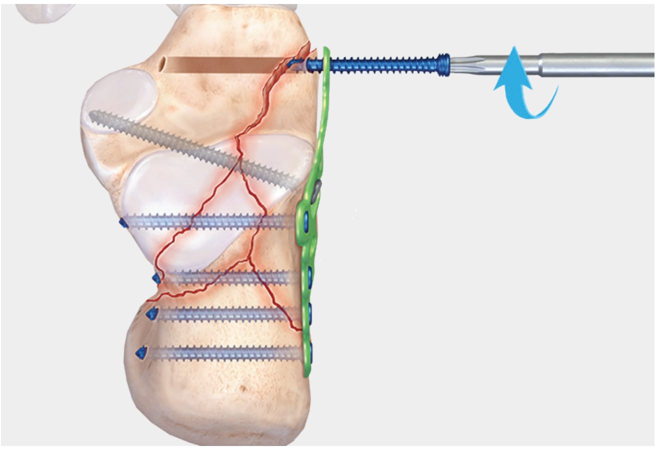
What are some of the advantages over traditional locking screws?

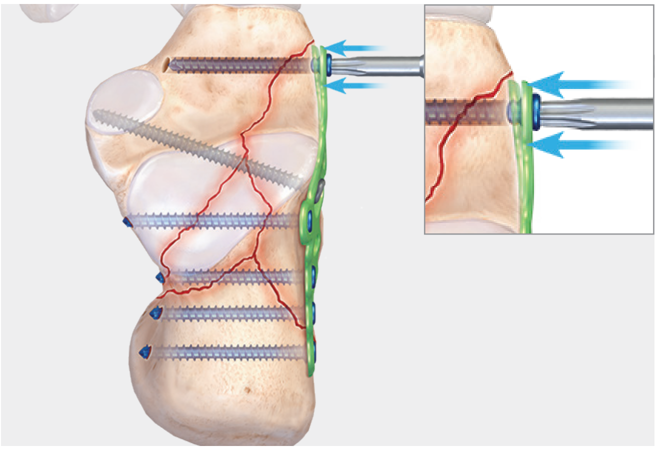
There are several advantages. With conventional cortical screws, the tightening of the screw compresses the plate against bone, thus generating friction and providing primary stabilization. The locking screw and plate provides a fixed-angle construct that stabilizes the segment without disrupting the cortical bone perfusion. Additionally, with locking screws, there is lower incidence of postoperative loosening. The KreuLock screw system provides improved results by combining the advantage of conventional screw compression by pulling the plate to bone, with a locking screw construct—all through load-sharing osteosynthesis.

When does the use of these screws make the most sense? Why?

Calcaneal perimeter plates/sinus tarsi plate, distal fibula fracture fixation with a locking plate, midfoot fractures and fusions with the forefoot CFS plates, and the 1st MTPJ fusion plating system are all good applications for these screws. The KreuLock screw provides excellent compression of the plate/screw construct without having to waste, exchange, or use an in-and-out cortical screw to compress the plate to bone.[1] With anatomic fixation, either the plate has to be bent appropriately, which may weaken the plate or construct itself, or a cortical screw is used to compress the plate to bone then exchanged with a locking screw to provide a fixed-angle construct. The KreuLock screw eliminates this step. In my opinion, the KreuLock screw was not designed to replace a cortical screw, but to provide the advantages of a locking screw that can compress, without over compressing the plate/screw construct.







Reference

1. Arthrex, Inc. Data on file (APT-04383, APT-04135A, APT-04100A, APT-04136 and APT-04120). Naples, FL;2019-2020.

What's in My Bag?

KreuLock™ Locking Compression Screws (Cont.)

Are there any technical pearls or surgical steps that are important or that you keep in mind when using these screws?

The technique is not much different than for a standard locking or cortical screw. However, an important step to remember is to use the profile drill after the standard drill. This provides a countersink effect, much like when using a headless screw, and allows the variable pitch of the KreuLock screw to engage the bone and the plate in sequential fashion. Due to the variable thread pitch, the KreuLock screw will engage rapidly with a stronger bite. Not using the profile drill can actually cause diastasis of the plate/screw construct, especially in healthy bone.

Have you experienced any drawbacks to this new technology or is there a situation where you would elect to not use KreuLock screws in your construct?

The KreuLock screw is innovative and provides a stable construct. If there is a need for a locking screw where you would need relative compression of the plate/screw construct, then there is usage for this screw. I would advise against using it in the most proximal fibula or tibia plating hole and would still use a cortical screw to prevent a peri-prosthetic fracture above or adjacent to the plate.

Have you seen any cases where these screws provided a significant benefit to your construct?

Specifically with the new MaxForce™ 1st MTPJ fusion plating construct. Typically, you would need to use a cortical screw distally to compress the plate to bone then exchange it for a locking screw. The Kreulock screws eliminate that step. Additionally, midfoot fusions or fractures or forefoot CFS where the declination angle of the metatarsals varies from patient to patient. These screws provide excellent stability and compression without violating the permeability and perfusion of the periosteum/cortical component of bone. Lastly, calcaneal plating constructs. Cortical screws can sometimes over-compress in the anterior process or body of the fracture, which can essentially create mild mal-reduction issues of the posterior facet or height/width of the calcaneus. The KreuLock eliminates over-compression and screw exchange, all while keeping an anatomical reduction.

How would you introduce these screws to a new user? What might you tell them?

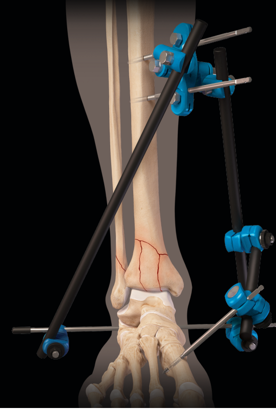
The KreuLock screw is not designed to replace a cortical screw; it is designed to add to the advantages of locking screw/plate constructs through compression, strength[1], and stability. Wherever a locking screw is needed with any plate in the foot or ankle, the KreuLock screw can be used.

Reference

1. Arthrex, Inc. Data on file (APT-04259A, APT-04280A, APT-04385). Naples, FL;2019-2020.

Case Report

Comminuted Ankle Fixation Using ArthroFX® System, Pilon Plates, and the FibuLock® Fibular Nail



Justin Fleming, DPM

Pilon fractures are high-energy fractures of the distal tibia with marked disruption of the articular surface of the ankle. Typically, pilon fractures are accompanied by complex fibular shaft fractures. Staged protocols to treat these injuries has been well established and consist of skeletal stabilization (length, rotation, axial alignment) via application of an external fixator shortly following the accident. The primary goal of the first stage is to allow for resuscitation of the soft-tissue envelope to reduce infection and wound complications in the second stage consisting of plate osteosynthesis. This combination of steps significantly improves the outcomes of these devastating injuries. The following case study demonstrates the scope of capabilities offered by Arthrex Trauma.

Figure 1

Figure 2

Figure 3

Case Report:
A 47-year-old female involved in a MVA presents to the trauma center with closed wrist and ipsilateral closed pilon fracture with segmental fibular shaft fracture (Figure 1). She was medically cleared and brought to the OR for closed reduction and application of the ArthroFX external fixator. A traditional delta frame configuration was used. Consideration was given to open plating of fibular fracture; however, based on my experience, this was amenable to intramedullary nailing with Arthrex FibuLock nail during the second stage. Minimally invasive nailing of the fibula in pilon fracture scenarios reduces the surgical footprint, which decreases the chance of infection and avoids conflict with other incisional corridors necessary for fixation of the tibia.

Intraoperative fluoroscopic images demonstrated appropriate length and axial alignment with improved rotation (Figures 2 and 3). Considerations prior to fixation placement should include the following:

1. Defining the zone on injury (both soft tissue/bone).

- External fixation pins should lie outside the zone of injury to reduce the potential of contamination/infection of the fracture/soft tissue.

2. Defining anticipated zone of hardware placement (Figure 4).

- For the same reasons, pins should be placed outside the anatomic area where internal fixation will be used.
- Based on the diaphyseal extension of the fracture, this is not always possible.

Figure 4

Figure 5

Figure 6

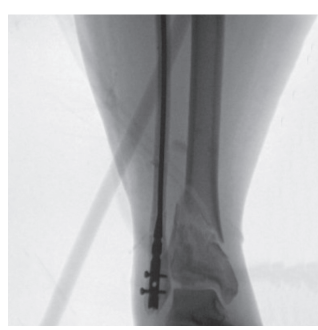
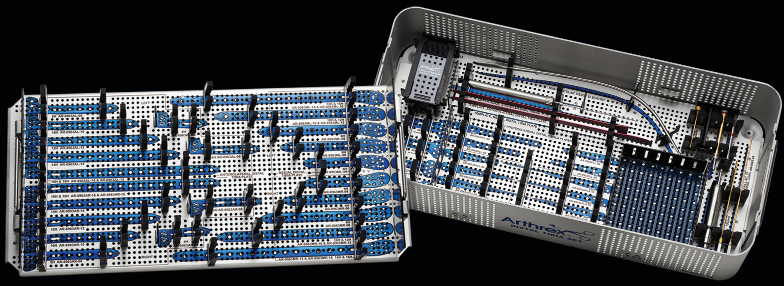


Figure 7

Figure 8

Case Report (Cont.)



Comminuted Ankle Fracture using ArthroFX® system, Pilon Plates, and the FibuLock® Fibular Nail

A traction CT was obtained following the initial stage to determine fracture complexity and architecture. This study is crucial to determine and plan several components of the second stage, including:

- Incisional corridors based on fracture planes
- Order of fracture reduction
- Order of fracture fixation
- Type of implants necessary for stabilization

Intramedullary fixation was chosen for the segmental diaphyseal fibular fracture. A small lateral incision was used to expose the proximal fibular fracture. Following reduction with the guidewire for the FibuLock intramedullary nail was placed and confirmed in AP and lateral views (Figures 5 and 6). After canal preparation, a 3.0 mm × 180 mm nail was passed and secured with two distal interlocking screws (Figure 7). One of the unique characteristics of this nail is its ability to create a friction fit against the endosteal surface of the proximal fibula when the nail-tip talons are deployed (Figure 8). This provides both rotational and axial stability.

In this case, the patient's presenting injury was valgus position of the tibia (Figure 1). Typically, this results in significant stretch that damages the medial skin. The CT demonstrates the primary fracture line in the anterolateral tibia (Figures 9 and 10). Based on these two factors, an anterolateral incision was used to avoid compromised tissue and allow for direct access to the "guts" of the fracture, which facilitates posterior to anterior reconstruction of the articular block and placement of a precontoured Arthrex anterolateral pilon plate (Figures 11-15). Metaphyseal nonunions of the tibia tend to fail in the direction of the original injury. Therefore, valgus injuries typically are treated with an anterolateral plate and varus injures are treated with a medial plate.

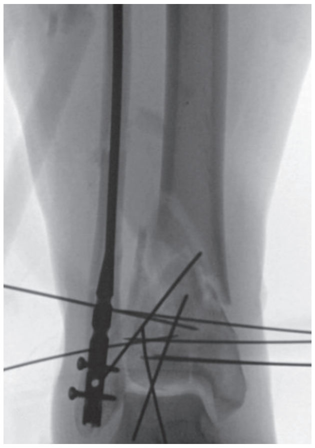


Figure 12

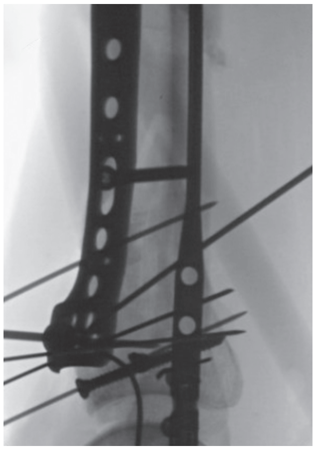


Figure 13

Figure 9

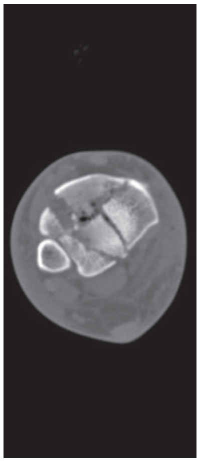


Figure 10

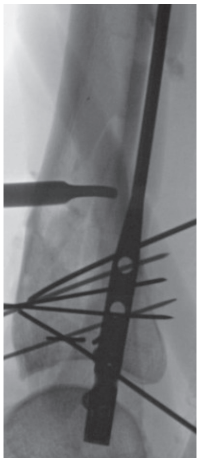


Figure 11

Figure 14

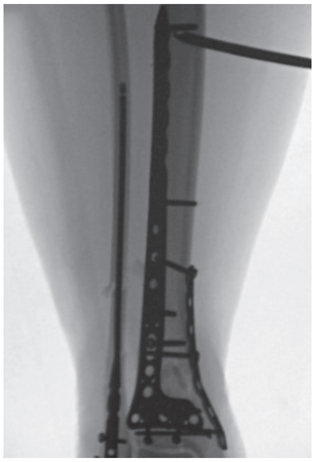
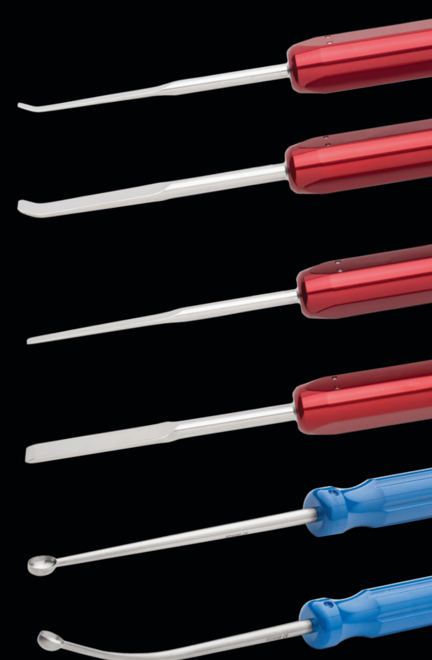


Figure 15

Minimally Invasive Arthrex Ankle Fusion Plate

Small Footprint, Huge Impact

Compared to the standard 3-screw fusion construct, the addition of an anterior plate increases construct rigidity and decreases micromotion at the ankle fusion interface without the need for an extensile incision.[1]



Osteotome Angled Up, 5.5 mm

Osteotome Angled Up, 12 mm

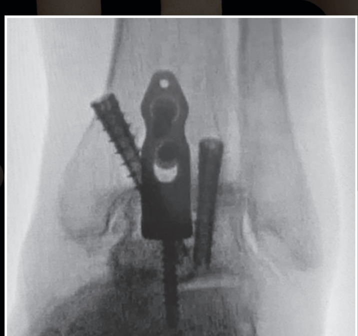
Osteotome Straight 5.5 mm

Osteotome Straight 12 mm

Cup Curette Straight, 6 mm

Cup Curette Curved, 6 mm

- Arthroscopic approach/reduced skin incision
- Plate acts as a tension band to resist plantar flexion
- Increased construct rigidity compared to a 3-screw fusion[1]



AP View

X-rays courtesy of David Dalstrom, MD (San Diego, CA)

Lateral View

Arthrex®

Ad.Arthrex.com/MIAP

Reference

1. Tarkin IS, Mormino MA, Clare MP, Haider H, Walling AK, Sanders RW. Anterior plate supplementation increases ankle arthrodesis construct rigidity. *Foot Ankle Int*. 2007;28(2):219–223. doi:10.3113/FAI.2007.0219

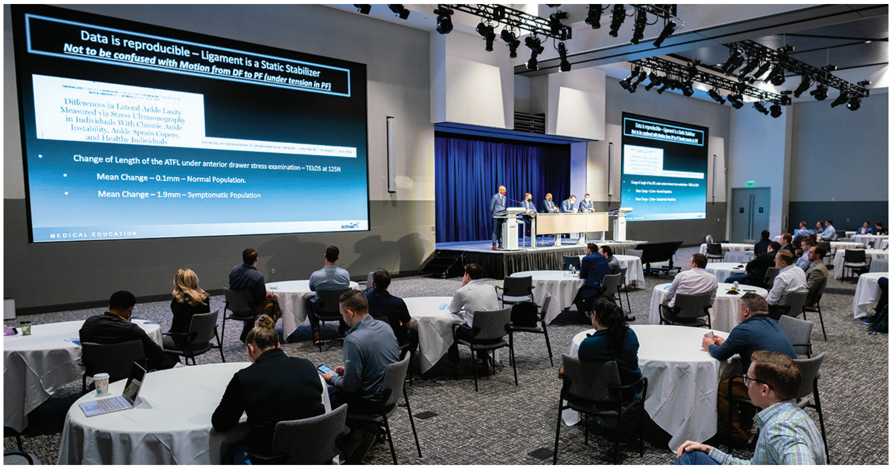
Distal Extremities Medical Education

Course Schedule

Upcoming Medical Education Events

Date	Course Name	Location
2021		
May 17	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
June 11-12	Surgical Podiatry Symposium	Naples, FL
June 14	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
July 24	Innovations in Forefoot Surgery	Naples, FL
August 5	Foot and Ankle MIS Course (Morning Course)	Newport Beach, CA
August 5	Foot and Ankle MIS Course (Evening Course)	Newport Beach, CA
August 6-7	West Coast Foot and Ankle Summit	Newport Beach, CA
August 20-21	Controversies in Foot and Ankle Surgery	Naples, FL
August 23	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
October 15-16	Foot and Ankle Orthopedic Technology & Innovation Forum	Naples, FL
November 5-6	Surgical Podiatry Symposium	Naples, FL
November 8	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
2022		
January 28-29	East Coast Foot and Ankle Summit	Naples, FL
January 31	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
March 12	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL
April 1-2	Surgical Podiatry Symposium	Naples, FL
May 16	Foot and Ankle Minimally Invasive Surgery Course	Naples, FL

East Coast Foot and Ankle Summit



East Coast Foot and Ankle Summit

Foot and Ankle MIS Level II Course

Notes

Notes

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