Arthrex®

Midfoot Plating Techniques

Surgical Technique

Midfoot Plating Techniques

Lapidus Plate

Designed to provide excellent fixation for a lapidus procedure, the Lapidus Plate offers the foot & ankle surgeon an anatomically contoured and configured option for procedures in the midfoot. The slot in this low profile plate allows the surgeon the choice of placing a lag screw across the TMT joint, as an outrigger screw to the 2nd metatarsal, or simply in offset compression mode. The surgeon may also choose to place locking or nonlocking screws in the other three plate holes.

Locking Option – The two proximal and most distal holes allow the surgeon to choose a fixed-angle locking or variable-angle nonlocking option, depending on the needs of the patient

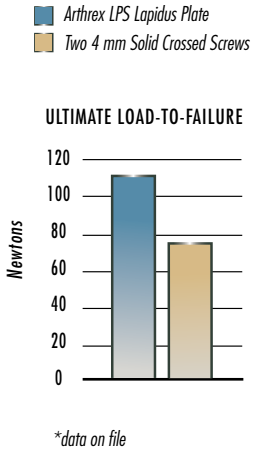
Compression Option – The inner slot can accomodate an interfragmentary screw or generate compression when drilled eccentrically

Minimized Profile – Low Profile Plates and screw heads reduce soft tissue irritation and the need for removal

Anatomic Contour – Optimizes construct strength, simplifies surgical technique and reduces soft tissue irritation

Anodized Finish – Dramatically improves smoothness

Screw Options – 3.5 mm cortical, locking and 4 mm cancellous



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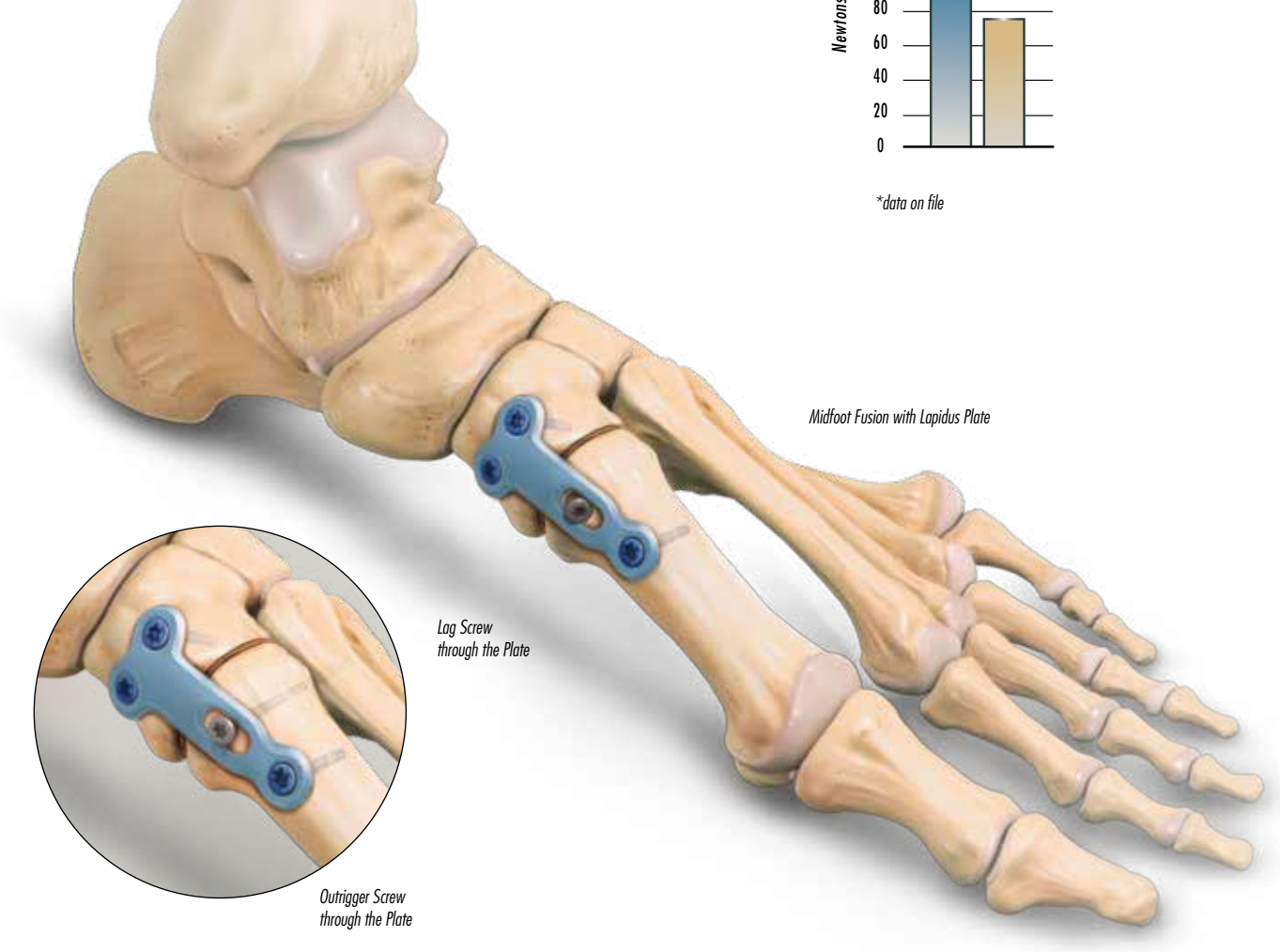


Midfoot Fusion with Lapidus Plate

Lag Screw through the Plate

Outrigger Screw through the Plate

H-Plates

Designed to provide excellent fixation for fusions and osteotomies, these plates offer the foot & ankle surgeon a comprehensive option for procedures in the midfoot. These additions to the Low Profile Plating System come with and without wedge blocks, and in a variety of lengths to fixate lateral column lengthenings, calcaneocuboid arthrodesis, talonavicular arthrodesis and other common procedures in the midfoot.

Left or Right Slants – Fits a variety of indications

Wedge Option – Wedges save OR time and eliminate the need to harvest a tri-coritcal wedge from the iliac crest

Locking Option – The outermost holes allow the surgeon to chose a fixed-angle locking or variable-angle nonlocking option, depending on the needs of the patient

Compression Option – The inner slots generate compression when drilled eccentrically in arthrodesis applications

Minimized Profile – Low profile plates and screw heads reduce soft tissue irritation and the need for removal

Anatomic Contour – Optimizes construct strength, simplifies surgical technique and reduces soft tissue irritation

Anodized Finish – Dramatically improves smoothness

Screw Options – 3.5 mm cortical, 3.5 mm cortical locking and 4 mm cancellous

Consider These Surgical Procedures:

- *Lateral Column Lengthening*
- *Midfoot Fusions*
- *Calcaneal-cuboid Fusion*
- *Talonavicular Fusion*

Midfoot Fusion with Flat Plate

Locking Screw for Stability

Nonlocking Screw for Reduction and Compression

Lisfranc Plates

The new Lisfranc Plates were designed to provide fixation for acute Lisfranc injuries and fusions of the tarsal-metatarsal joints. The unique design allows for compression along the Lisfranc ligament and allows the surgeon to visualize the healing process during recovery. These plates come in three different sizes with both left and right plates to fit any patient and are contoured to fit the Lisfranc anatomy at only 1.4 mm thick.

Allows visualization – of the Lisfranc joint during healing process

Compresses along the Lisfranc ligament – along the line of injury

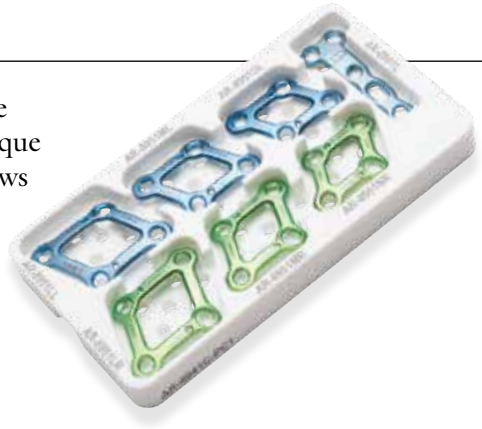
Eliminates the joint damage – that may occur with the use of screws and Guidewires

Bridge-plating preserves the joint surfaces – and results in larger surface area for bony fusion

1.4 mm maximum thickness – providing minimal prominence and low profile contouring

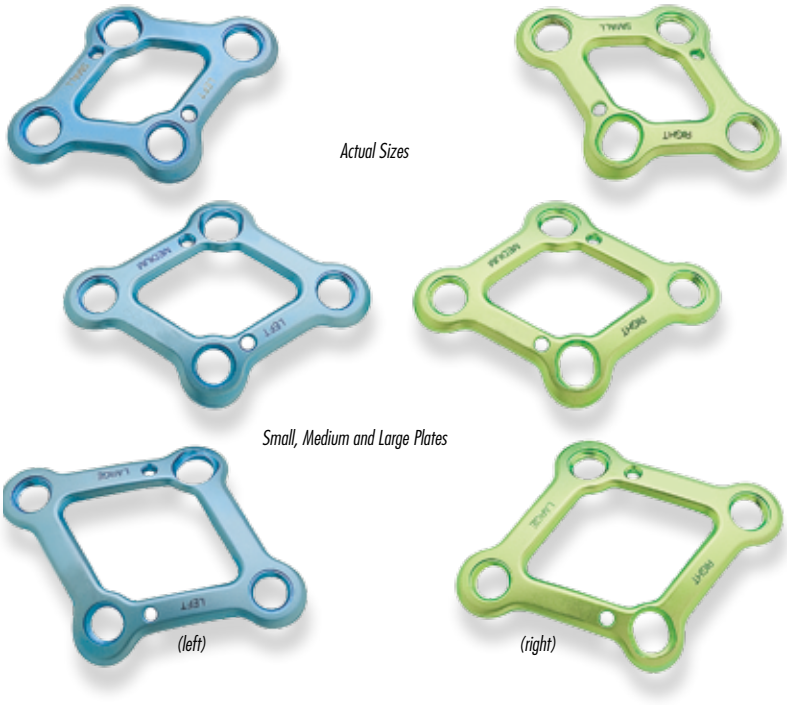
Contoured to fit the 1st/2nd metatarsal – cuneiform joints

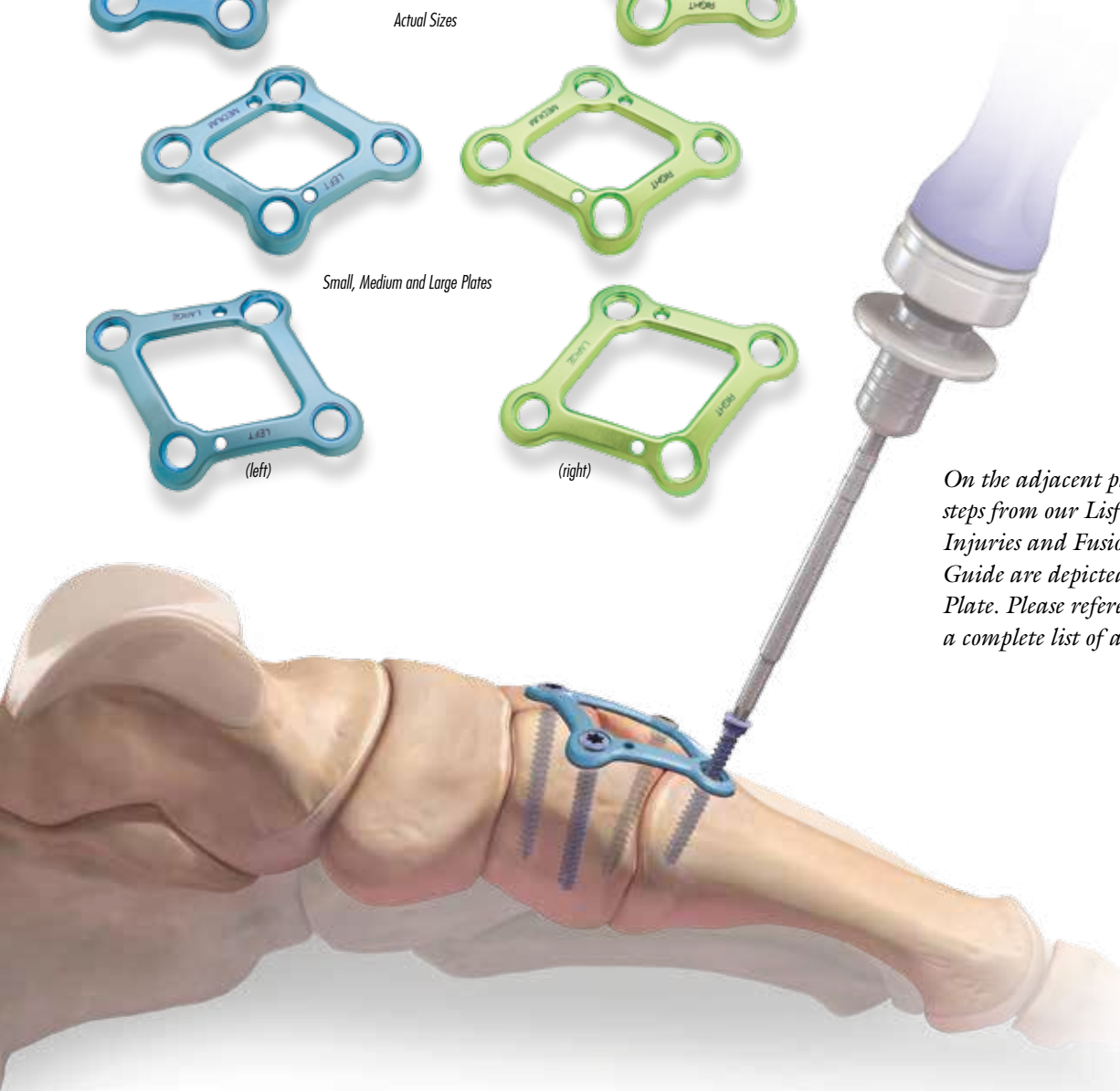
Allows room – for normal interfrag screw placement



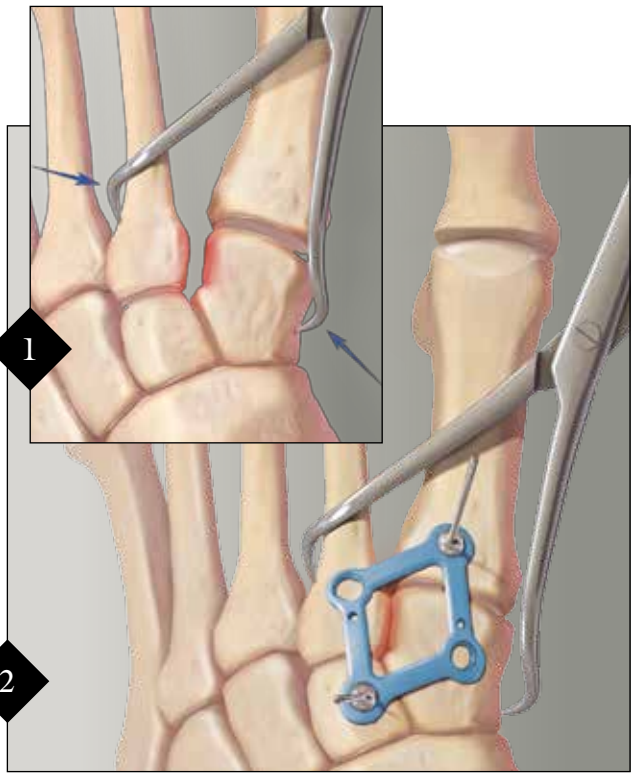
The new module, AR-8941C-PC1 houses the long Lapidus Plate and the new family of Lisfranc Plates and is nested in AR-8941C-PC.

Midfoot Plating Module Set – AR-8941S houses the Plate Caddy Insert along with the H-Plates and Lapidus Plates.



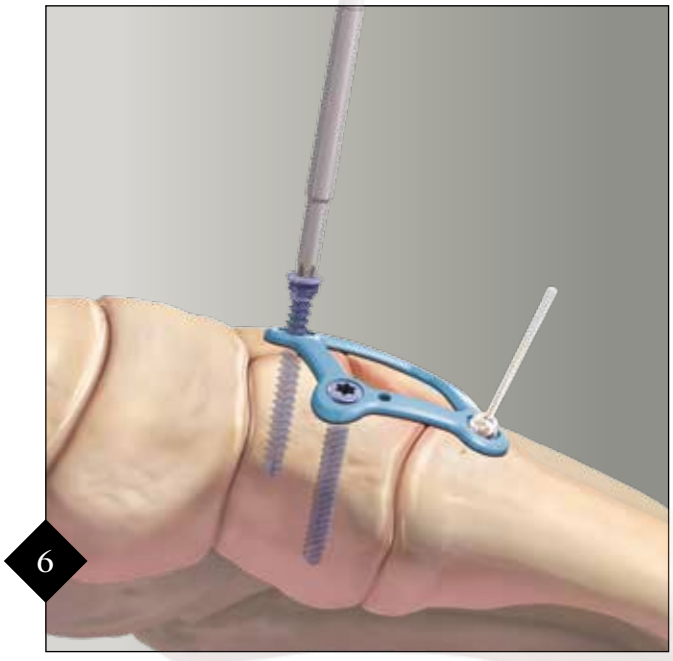


On the adjacent page some of the surgical steps from our Lisfranc Reduction for Injuries and Fusions Surgical Technique Guide are depicted, utilizing the Lisfranc Plate. Please reference LT1-0434-EN for a complete list of all steps.

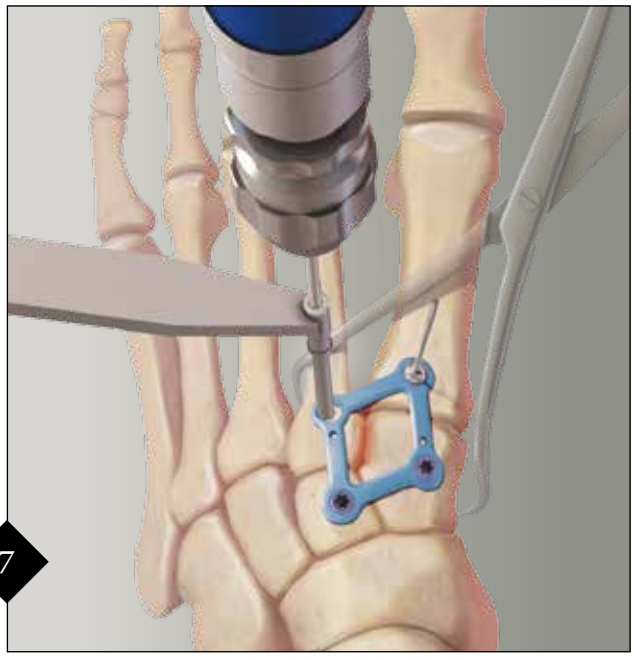


Upon exposure, the Lisfranc fracture/dislocation is reduced using a bone reduction clamp. Additional K-wires can be used to supplement the fixation.

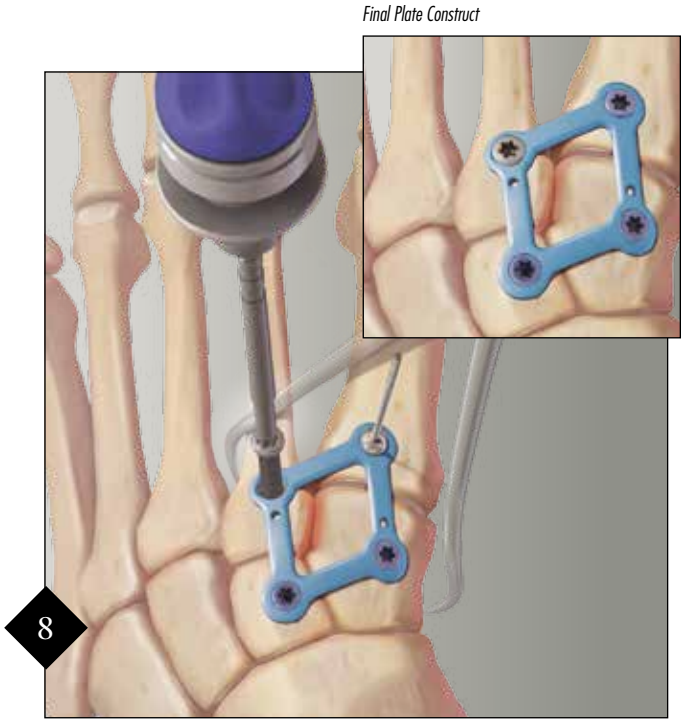
The appropriate sized plate is placed dorsally over the Lisfranc joint. The 1st metatarsal and intermediate cuneiform can be temporarily secured with BB-Taks. Additionally, there are other holes in the plate where the BB-Taks can be used for added fixation. *Note: See full surgical technique for all steps.*



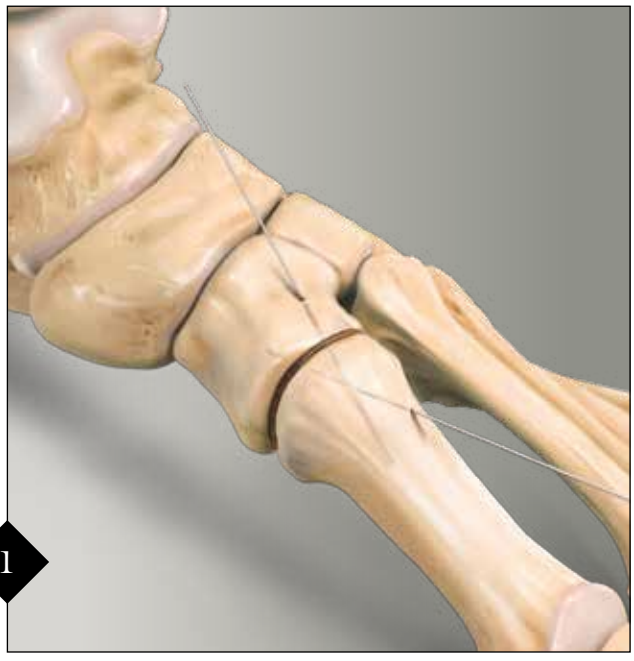
The same steps are used to place the other proximal 3.5 mm locking screw.



The 2.5 mm drill guide is used to eccentrically drill the oblong hole over the 2nd metatarsal for the 3.5 mm cortical screw.

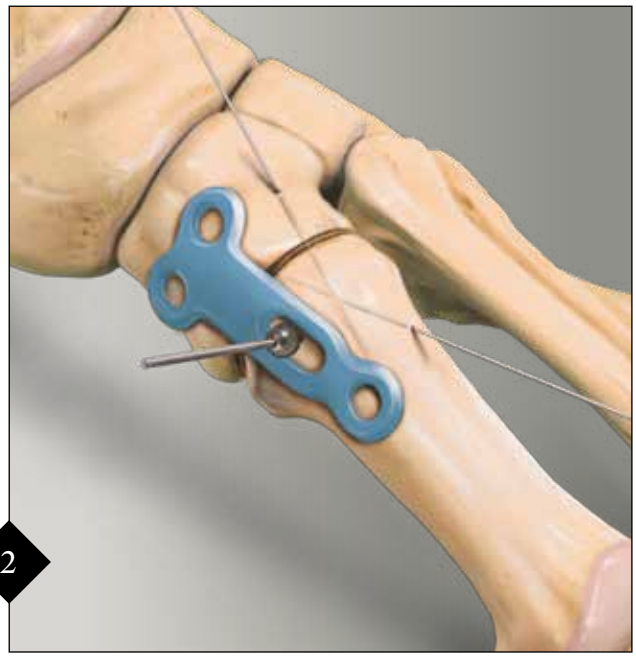


Placement of 3.5 mm cortical screw eccentrically in the oblong slot over the 2nd metatarsal for added compression along the Lisfranc ligament.



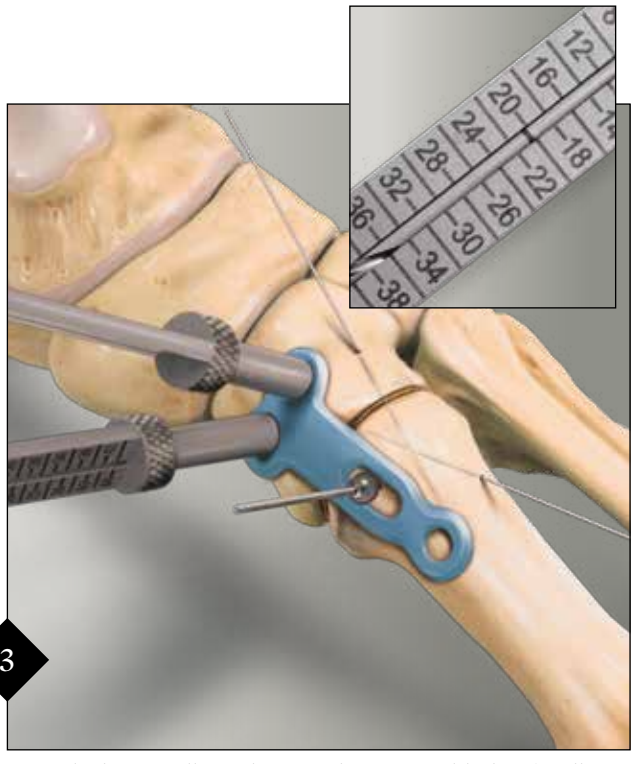
1

Provisionally fix the MTC joint with K-wires to the side of the eventual plate placement.



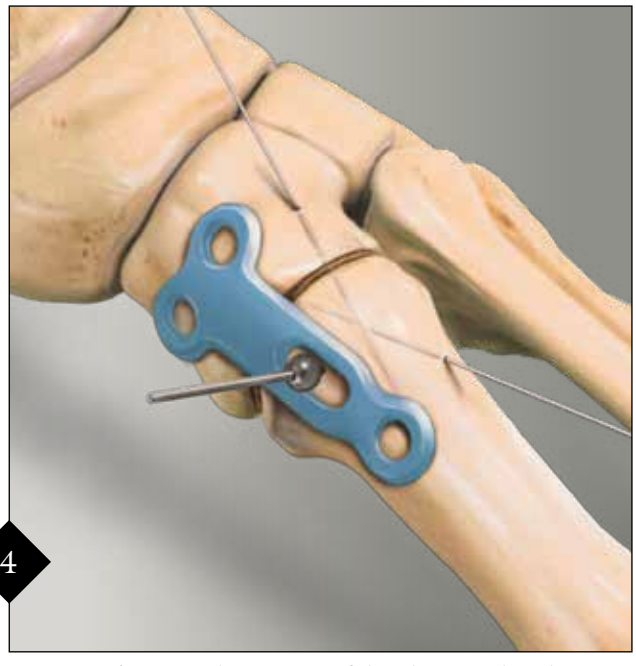
2

Provisionally hold the Lapidus Plate in place with a BB-Tak at the slot. Make sure the plate is reduced to the bone and fully secure. If needed, plate may be contoured at this point.



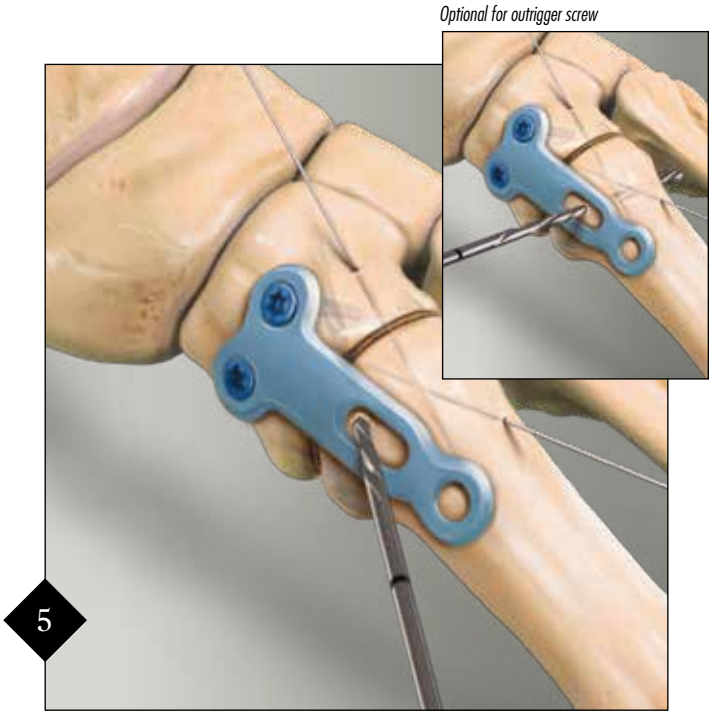
3

Insert locking Drill Guides into the proximal holes. (Drill Guides may also be preassembled on a back table). Drill both holes, noting depth from laser line on the 2.5 mm drill. A conventional Depth Device may also be used after the locking Drill Guides are removed.



4

Insert a 3.5 mm Locking Screw, if the plate is reduced to bone. If greater reduction is desired, insert a standard screw first and then a Locking Screw. Standard screw may be replaced later, if two proximal Locking Screws are desired.



Drill for the lag screw at as steep an angle as possible aiming between two proximal screws with a 2.5 mm drill. Overdrill the metatarsal base with a 3.5 mm drill.

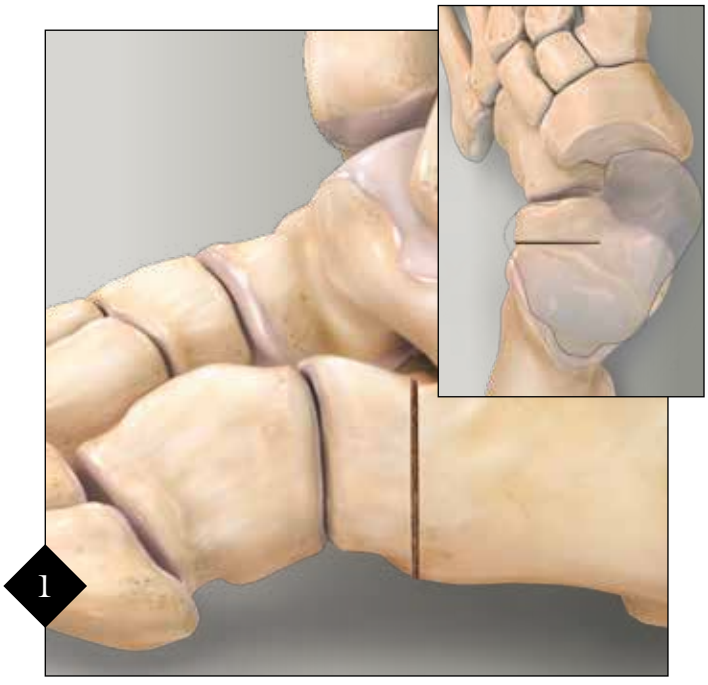
Optional: Drill from 1st metatarsal to 2nd if outrigger screw is desired to help reduce IM angle.

Remove K-wires. Insert a 3.5 mm screw until it contacts the plate. Tighten the screw and compress across the MTC joint. The head of the screw will be slightly angled.

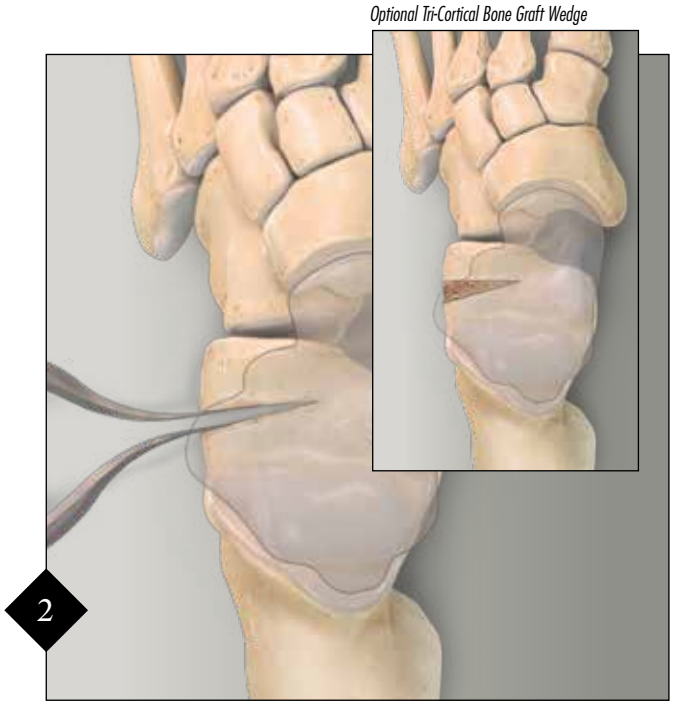
Insert the locking Drill Guide into the distal hole. Drill bicortically, noting depth from laser line on the 2.5 mm drill. A conventional Depth Device may also be used once the locking Drill Guide is removed.

Insert a 3.5 mm Locking Screw distally.

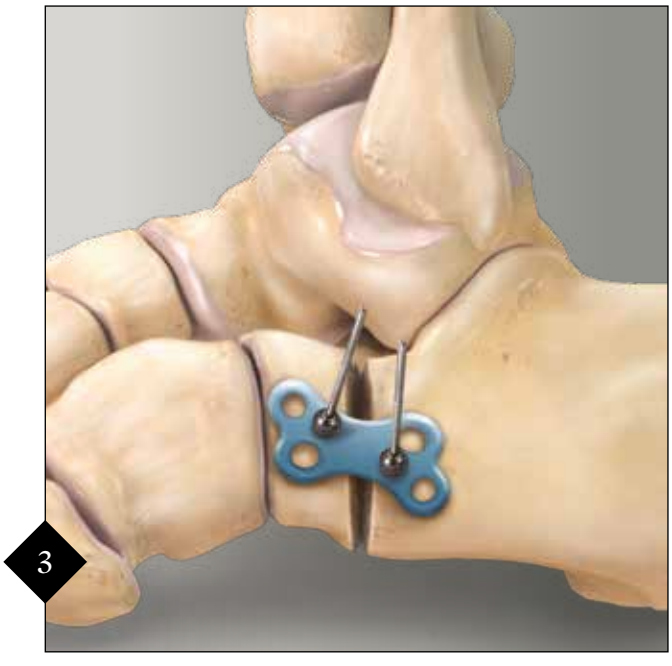
H-Plate Evans Technique



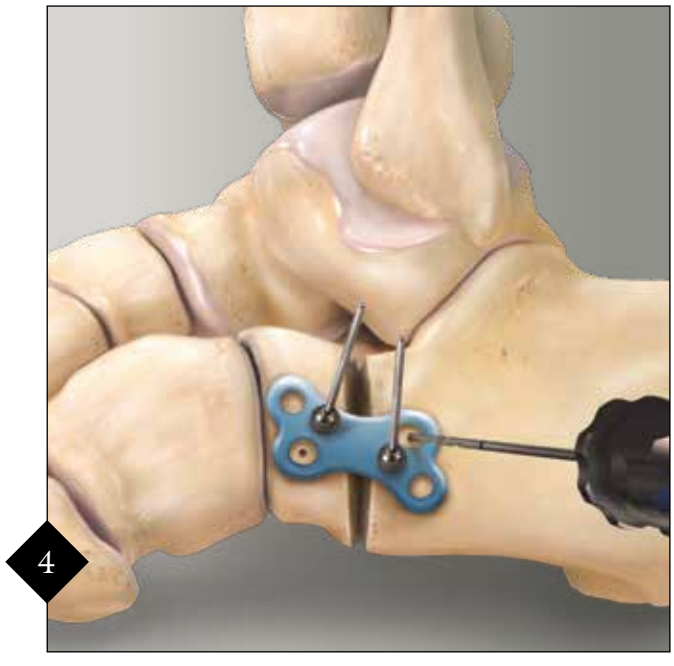
Make a single transverse cut at least 1.2 cm to 1.5 cm posterior to the calcaneal-cuboid joint and just anterior to the subtalar joint.



With the Osteotomy Distractor or lamina spreader, open osteotomy and assess correction. Select either a plate with a wedge or a tri-cortical bone graft wedge and flat plate.

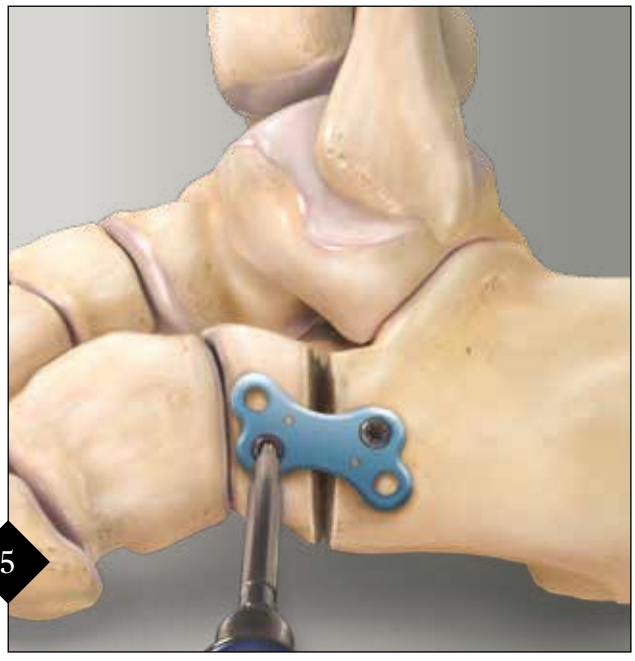


Provisionally hold the plate to the anterolateral side of the calcaneus with BB-Tak through either wire hole or locking screw hole.



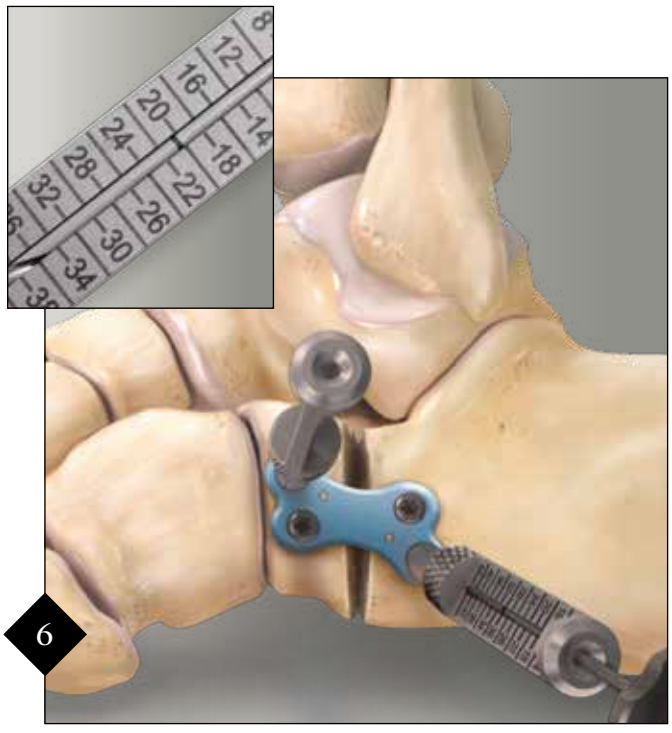
For static placement: Drill both nonlocking slots centrally with the 2.5 mm drill.

For compression: Drill both nonlocking slots away from the osteotomy with a 2.5 mm drill. Aim the drill so it does not interfere with the eventual path of the Locking Screws.



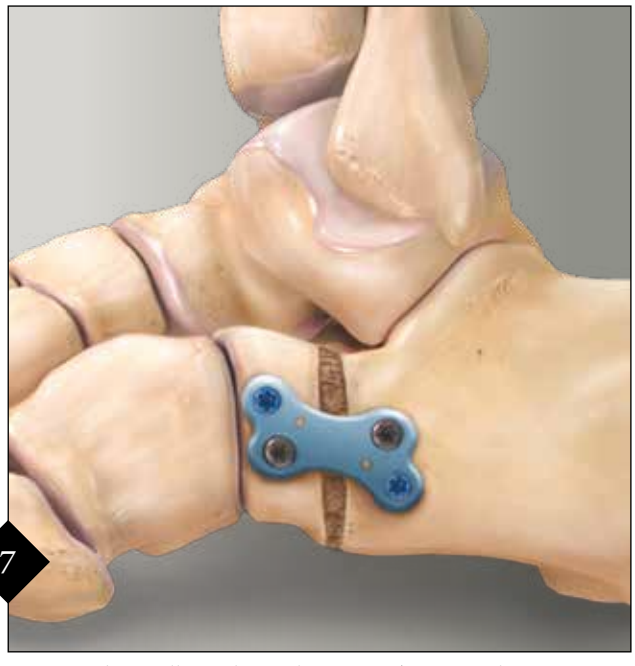
5

Insert 3.5 mm or 4 mm nonlocking screws and remove the BB-Taks. Tighten the screws alternately to reduce plate-to-bone.



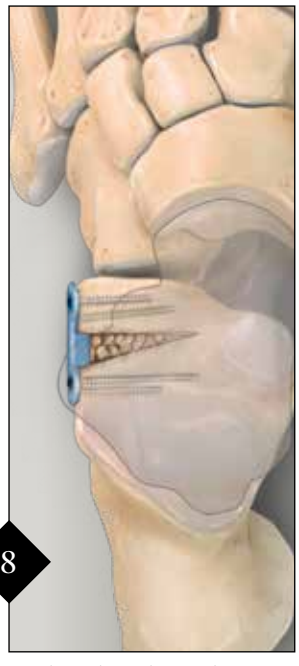
6

Thread the locking Drill Guides into the locking holes. Locking Drill Guides may be threaded into the plate on the back table prior to surgery. Drill both holes, noting depth from laser line on the drill.
Note: If one hits the nonlocking screw, try to ease by. If impossible, remove guide and drill freehand for nonlocking screw.



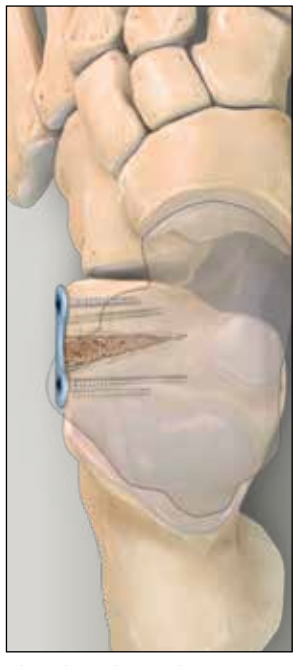
7

Remove the Drill Guides and insert 3.5 mm Locking Screws.



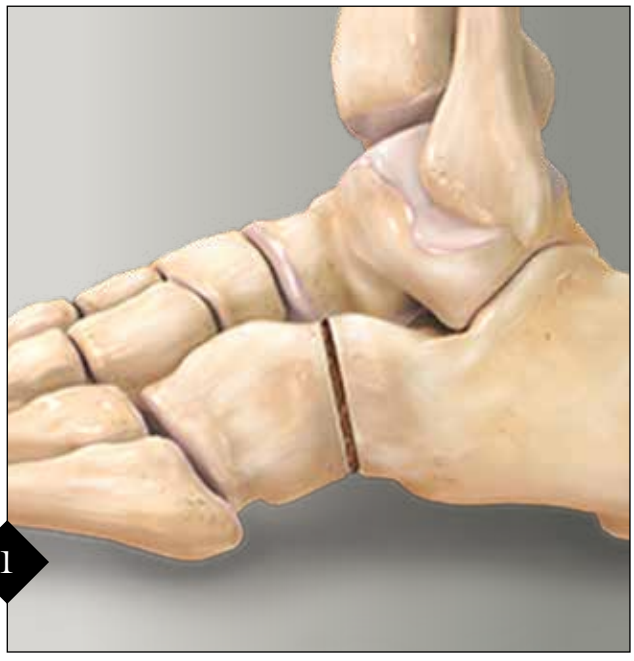
8

Wedge plate shown here with bone graft packed into the void.



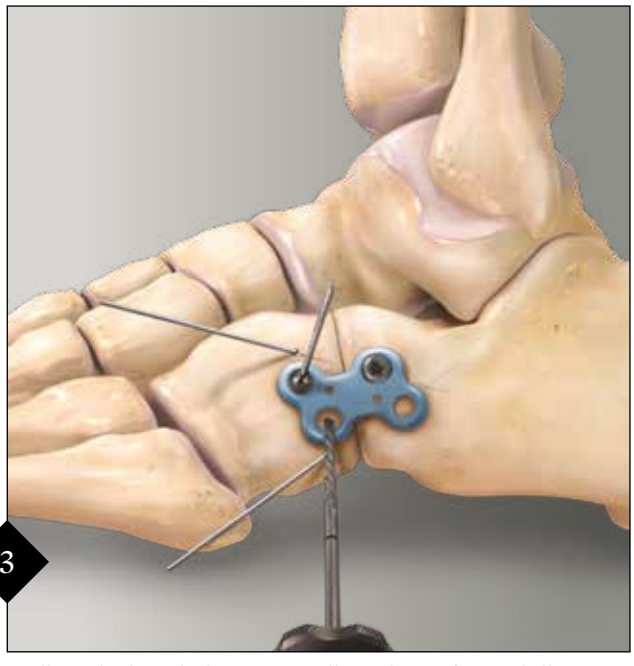
Flat plate shown here with the tri-cortical bone graft wedge option.

H-Plate CC Arthrodesis Technique*



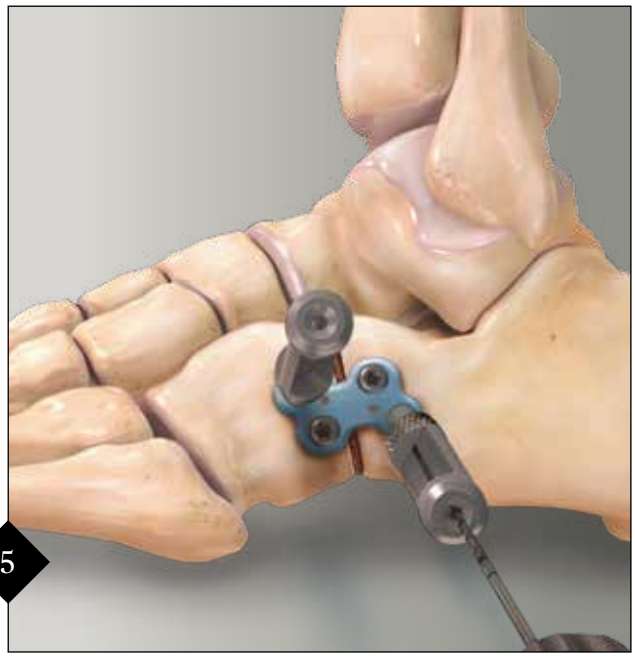
Completely denude cartilage from the calcaneocuboid joint for fusion.

Pin the joint with K-wires. Provisionally, hold the plate to anterolateral side of the calcaneus with a BB-Tak through wire or locking screw holes.



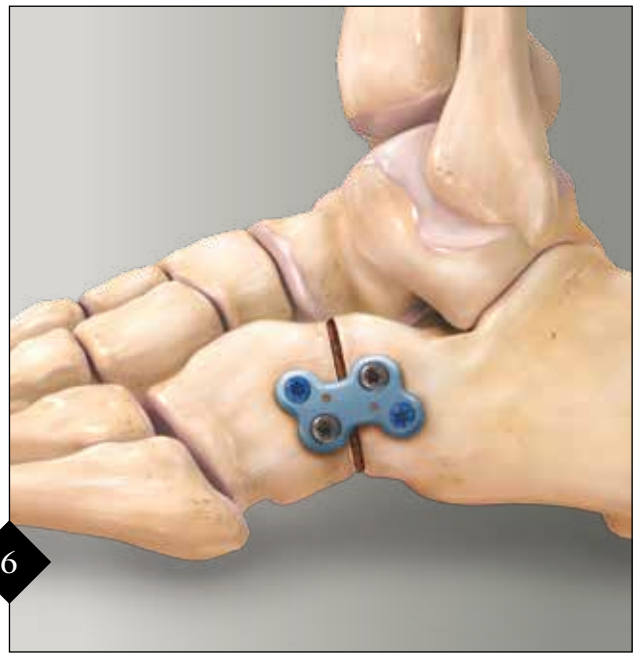
Drill nonlocking hole eccentrically with a 2.5 mm drill–away from joint. Insert a 3.5 mm or 4 mm screw 90%. Drill other nonlocking hole eccentrically with a 2.5 mm drill.

Insert second 3.5 mm or 4 mm screw 90%. Remove K-wires and the BB-Tak. Tighten both nonlocking screws alternately to reduce the plate-to-bone and achieve compression. Each slot should achieve 1 mm of compression.



5

Thread locking Drill Guides into locking holes. Locking Drill Guides may be threaded into the plate prior to its introduction to the surgical site. Drill bicortically with a 2.5 mm drill, noting the depth from the scale on the Drill Guide.



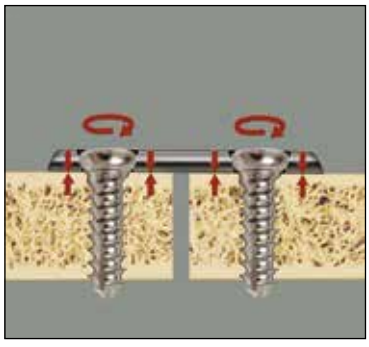
6

Remove Drill Guides and insert Locking Screws.

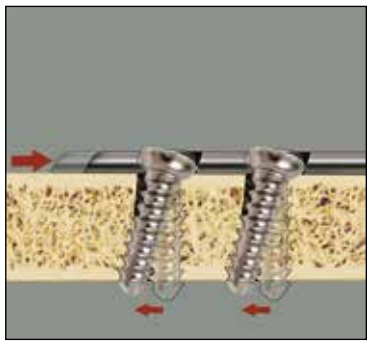
**A similar technique may be used for talonavicular or other midfoot fusion procedures.*

Plate/Screw Mechanics

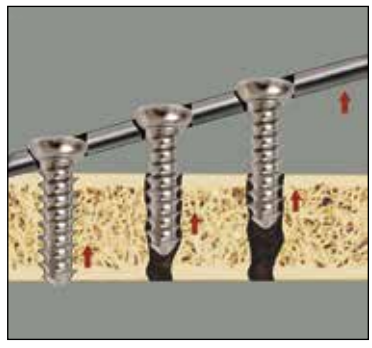
Nonlocking Screws and Plate



Reduction, and possibly compression with standard screws

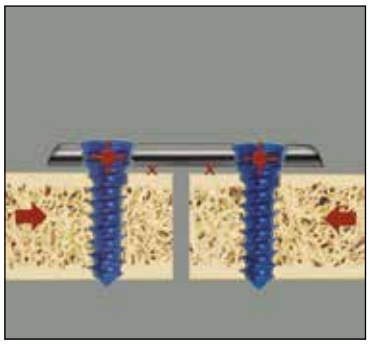


Axial load may cause standard screws to toggle and loosen

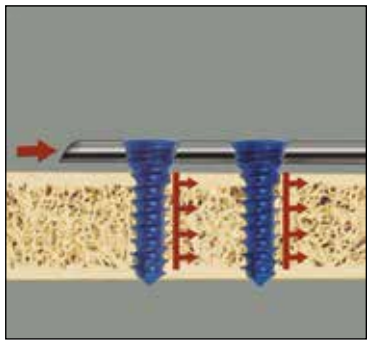


Bending load requires only screw pull-out to fail

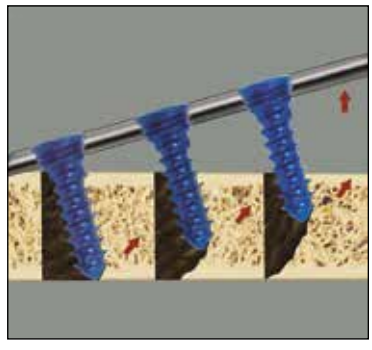
Locking Screws and Plate



No reduction, limited bone contact, and total construct load-sharing with locking screws

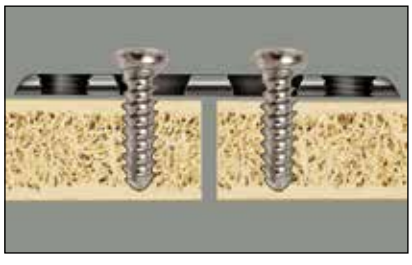


Axial load distributed evenly through the bone

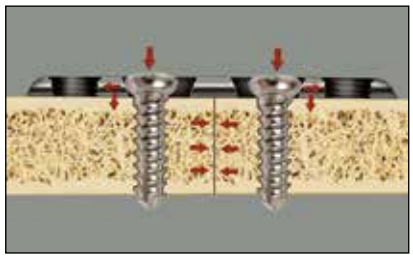


Bending load requires large scale screw, cut-through to fail

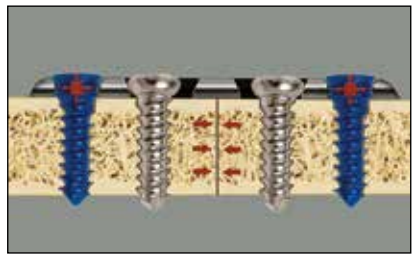
Hybrid Plate



Nonlocking screws drilled and inserted eccentrically away from the bone gap



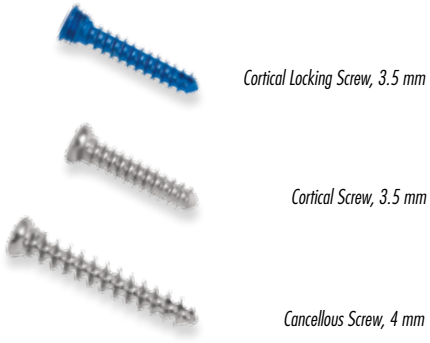
Reduction of the plate-to-bone and compression, as the screws are inserted and tightened



Locking screws are inserted to hold everything in place – improving construct strength against bending and axial loading

Low Profile System Midfoot Plating Module for H-Plates, Lisfranc and Lapidus Plates

The modules of the Low Profile Plating System house the Lapidus, Lisfranc and H-Plates, along with the 3.5 mm cortical, 3.5 mm cortical locking and 4 mm cancellous screws. The instrumentation for these implants is straightforward and easy to use, assisting the surgeon with distraction, provisional fixation and other elements of the procedure. This module is stackable with the Forefoot Osteotomy, Forefoot Fusion and other future modules. Additionally, all plates and instrumentation are also available in the Comprehensive Foot System (CFS) AR-8950S-02 (3.5/4.0 CFS Module).



Cortical Locking Screw, 3.5 mm

Cortical Screw, 3.5 mm

Cancellous Screw, 4 mm

Ordering Information

Midfoot Plating Module Set (AR-8941S) includes:

Driver Handle w/AO connection, cannulated	AR-13221AOC
Osteotomy Distractor	AR-13225
Drill Bit, 2.5 mm	AR-4160-25
Drill Bit, 3.5 mm	AR-4160-35
Drill Bit, 4 mm	AR-4160-40
Bone Reduction Forceps w/Teeth	AR-4160FT
Depth Device, small	AR-4166
Bending Iron	AR-8941BI
Bending Pliers	AR-8941BP
Hexalobe Driver, T15	AR-8941DH
Drill Guide for metal screws, 3.5 mm/4 mm	AR-8941G
Drill/Depth Guide, locking	AR-8941GL
Osteotome, short, 10 mm	AR-13203-10
Osteotome, short, 12 mm	AR-13203-12
Hohmann Retractor, 8 mm x 16 cm	AR-13210
Countersink, 3.5 mm/4 mm Screws	AR-4162
Drill Guide, 3.5 mm/4 mm	AR-8935G
Bone Tap, 3.5 mm	AR-8935T
Bone Tap, 4 mm	AR-8940T
Screw Holding Forceps	AR-8941F
Low Profile System Instrument Case	AR-8941C
Midfoot Plate Caddy (a)	AR-8941C-PC
Plate Caddy Insert (b)	AR-8941C-PC1

Plates, flat (housed in AR-8941C-PC, order separately):

H-Plate, 36 mm x 16 mm, large, left	AR-8942L-L
H-Plate, 36 mm x 16 mm, large, right	AR-8942R-L
H-Plate, 32 mm x 16 mm, medium, left	AR-8942L-M
H-Plate, 32 mm x 16 mm, medium, right	AR-8942R-M
H-Plate, 28 mm x 16 mm, small, left	AR-8942L-S
H-Plate, 28 mm x 16 mm, small, right	AR-8942R-S

Plates, wedge (housed in AR-8941C-PC, order separately):

H-Plate, 38 mm x 16 mm, 10 mm wedge, left	AR-8942L-10
H-Plate, 38 mm x 16 mm, 10 mm wedge, right	AR-8942R-10
H-Plate, 36 mm x 16 mm, 8 mm wedge, left	AR-8942L-08
H-Plate, 36 mm x 16 mm, 8 mm wedge, right	AR-8942R-08
H-Plate, 34 mm x 16 mm, 6 mm wedge, left	AR-8942L-06
H-Plate, 34 mm x 16 mm, 6 mm wedge, right	AR-8942R-06

Plates (housed in AR-8941C-PC, order separately):

Lapidus Plate	AR-8941

Plates (housed in caddy insert AR-8941C-PC1, order separately):

Lapidus Plate, long	AR-8941L
Lisfranc Plate, small, right	AR-8951SR
Lisfranc Plate, small, left	AR-8951SL
Lisfranc Plate, medium, right	AR-8951MR
Lisfranc Plate, medium, left	AR-8951ML
Lisfranc Plate, large, right	AR-8951LR
Lisfranc Plate, large, left	AR-8951LL

Screws:

Locking Screws, titanium, 3.5 mm x 14 – 44 mm	AR-8935L-14 – 44
Low Profile Screws, titanium, 3.5 mm x 14 – 44 mm	AR-8935-14 – 44
Low Profile Screws, titanium, 4 mm x 14 – 44 mm	AR-8940-14 – 44

Disposables (necessary for procedure, order separately):

BB-Tak	AR-13226
BB-Tak, threaded	AR-13226T
Guidewire w/Trocar Tip, .062" (1.6 mm)	AR-8941K

Literature:

Lisfranc Reduction for Injuries and Fusions Surgical Technique Guide	LT1-0434-EN
Comprehensive Foot System Brochure	LB1-0437-EN

Multimedia:

Comprehensive Foot System iBook	EB1-0437-EN
Comprehensive Foot & Ankle Repair Surgical Technique *by J. Chris Coetzee, MD*	DVD -1103

Midfoot Plating Module Set – AR-8941S houses the Midfoot Plate Caddy – AR-8941C-PC (a) along with the H-Plates and Lapidus Plates.

The new module, Plate Caddy Insert – AR-8941C-PC1 (b) houses the long Lapidus Plate and the new family of Lisfranc Plates, nested in AR-8941C-PC (adjacent).

The plates, screws and instruments are also contained in the Comprehensive Foot System – AR-8950S-02

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.