stryker

PROstep® MIS
Lapidus

Operative technique

PROstep® MIS Lapidus

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This publication sets forth detailed recommended procedures for using Stryker devices and instruments. It offers guidance that you should heed, but, as with any such technical guide, each surgeon must consider the particular needs of each patient and make appropriate adjustments when and as required.

Important:
The patient should be advised that the device cannot and does not replicate a normal healthy bone, that the device can break or become damaged as a result of strenuous activity or trauma and that the device has a finite expected service life.

Removal or revision of the device may be required sometime in the future.

Cleaning and sterilization information is provided in the applicable instructions for use.

Non-sterile devices, including implants and instruments, must be cleaned and sterilized prior to use, in accordance with validated methods.

Devices that are able to be disassembled should be disassembled prior to point-of-use processing. Additionally, devices with movable components that do not facilitate disassembly should be manually articulated during the point-of-use processing step in order to evacuate additional soils.

Please remember that the compatibility of different product systems has not been tested unless specified otherwise in the product labeling.

Consult Instructions for Use (https://ifu.stryker.com) for a complete list of potential adverse effects and adverse events, contraindications, warnings and precautions.

The surgeon must advise patients of surgical risks, and make them aware of adverse effects and alternative treatments.

An implant whose packaging is open or damaged or whose expiration date has passed must not be used. Every precaution must be taken to ensure sterility when opening the packaging of the implant and during implantation.

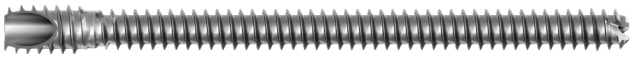
Introduction

The PROstep MIS Lapidus system is an internal fixation system intended for minimally invasive reduction of hallux valgus deformity and subsequent fusion of the first metatarsal cuneiform joint. The system is provided as single-use sterile packs and items comprised of blades, elevators, wires, drivers, cartilage and fenestration burrs, awls, high-flow irrigation sleeves, drills, depth gauges, and screws, as well as a set of reusable specialty instruments for correcting, distracting, compressing, and targeting placement of fixation. The recommended implant construct consists of PROstep MIS 5mm Chamfer Screws and existing 4mm PROstep MICA screws. All screws are composed of titanium alloy (Ti6Al4V) per ASTM F136.

PROstep MIS Chamfer Screws diameter and lengths

Diameter	Screw lengths
5mm	30mm, 32mm, 34mm, 36mm, 38mm, 40mm, 42mm, 44mm, 46mm, 48mm, 50mm, 52mm, 54mm, 56mm, 58mm, 60mm, 65mm, 70mm, 75mm, 80mm
4mm	20mm, 22mm, 24mm, 26mm, 28mm, 30mm, 32mm, 34mm, 36mm, 38mm, 40mm, 42mm, 44mm, 46mm, 48mm, 50mm, 52mm, 54mm, 56mm, 58mm, 60mm

PROstep MICA 4mm screw



PROstep 5mm Chamfer screw

Indications and contraindications

Indications

The PROstep MIS 5mm Chamfer Screw is indicated for fixation of bone fractures or for bone reconstruction. Examples include:

- Arthrodesis of the first metatarsal cuneiform joint to reposition and stabilize metatarsus primus varus
- Calcaneus/cuboid arthrodesis
- Talar/navicular arthrodesis

The MICA Screw is indicated for fixation of bone fractures or for bone reconstruction. Examples include:

- Mono or bi-cortical osteotomies in the foot
- Distal or proximal metatarsal osteotomies
- Weil osteotomy
- Fusion of the first metatarsophalangeal joint and interphalangeal joint
- Fixation of osteotomies for hallux valgus treatment (such as scarf, chevron, etc.)
- Akin type osteotomy
- Arthrodesis of the first metatarsal cuneiform joint to reposition and stabilize metatarsus primus varus
- Calcaneus/cuboid arthrodesis
- Talar/navicular arthrodesis

Contraindications

There are no product specific contraindications.

Prior to use of the system, the surgeon should refer to the product package insert for complete warnings, precautions, indications, contraindications, and adverse effects. Package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this operative technique and the package insert is available on the website listed.

Preoperative planning

Standing AP and lateral views of the foot should be obtained. This will allow assessment of the hallux valgus deformity.
A minimally invasive Lapidus procedure is preferred for more severe hallux valgus deformities. Assessment of metatarsus adductus, an excessively long first ray, lesser toe deformity, and metatarsalgia should be made as this may change the surgical plan. The Lapidus procedure is valuable for patients with:

- Elevated first ray
- Larger IM angle deformities
- Failed distal hallux procedures
- Second metatarsalgia

Surgical goals

The goals of surgery are to achieve a similar correction compared to the open procedure. Surgeons should check the correction of the hallux valgus angle, the inter-metatarsal angle, the first ray pronation angle, and the elevation of the first ray prior to final fixation. An additional Akin osteotomy may be considered if the patient has residual deformity or hallux valgus interphalangeus. The surgical goals are therefore to:

- Create minimal incisions and perform minimal dissection
- Correct the hallux valgus deformity in all three planes
- Remove cartilage completely from the first TMT joint while minimizing shortening of the first ray and leaving the subchondral plate primarily intact to anchor the screw fixation
- Achieve secure, stable fixation of the first TMT joint to allow early mobilization and encourage complete fusion

Operating room setup

The patient should be positioned at the end of the bed with the operative limb off the end of the table, enabling ease of access for X-ray. This will allow anterior-posterior and lateral X-ray views throughout the procedure. A bean bag or hip bump may be necessary to ensure vertical orientation of the foot.

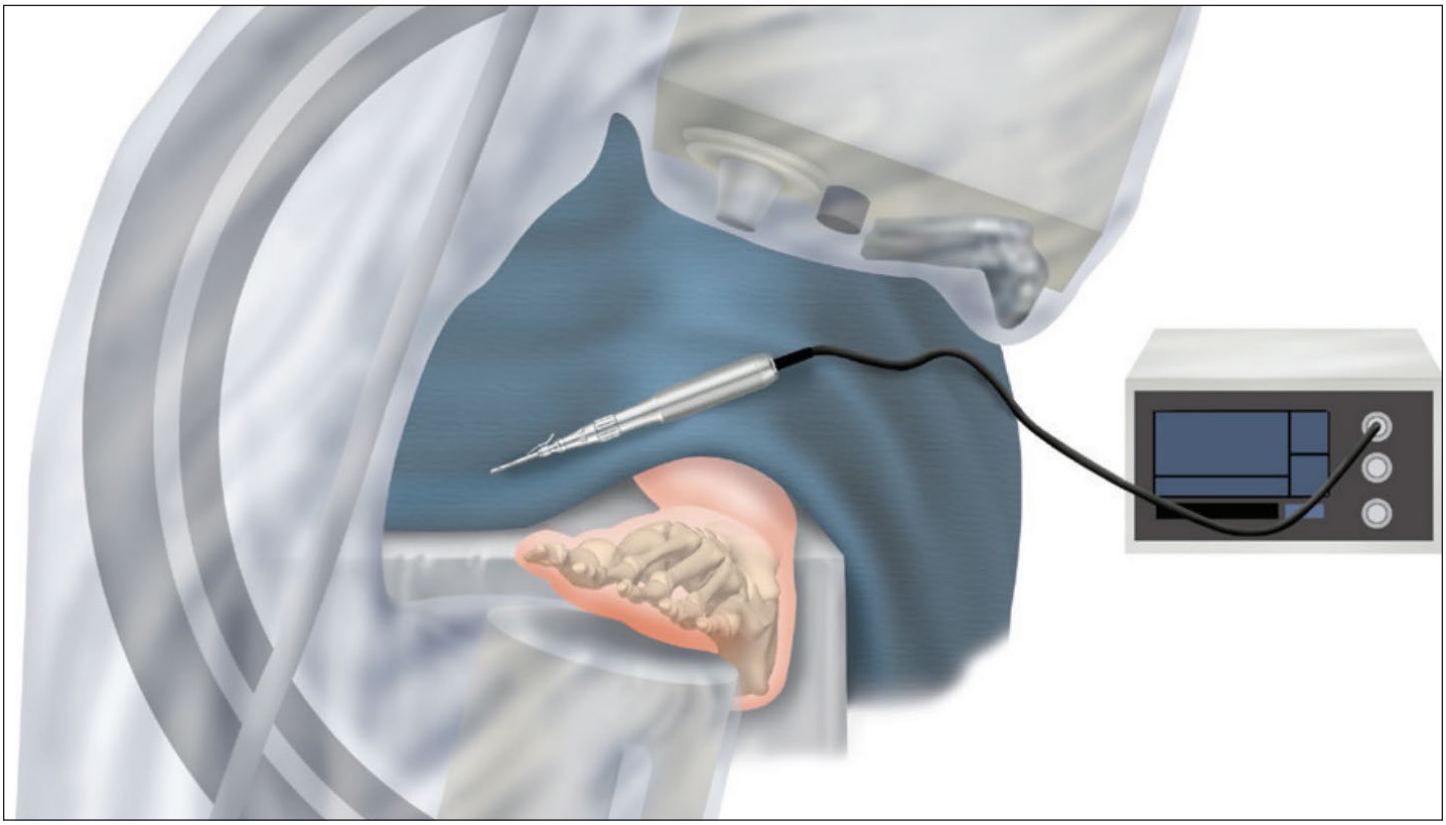
The C-arm should come in from the patient's right, allowing rotation of the C-arm to achieve these X-ray views.

The PROstep Power Box should be positioned towards the head of the bed on the patient's left.

This setup enables free movement of the surgeon around the patient's feet, to either stand at the side or end of the table as the operation demands. The position of the equipment is independent of whether the operative side is left or right. The positioning of equipment can be mirrored for a left-handed surgeon.

For surgeons who prefer to use arthroscopy, complete cartilage removal can be confirmed with a 2.9mm or 3.0mm arthroscope. Alternatively, a mini scope can be used. The arthroscopy tower should be positioned on the patient's left towards the head of the bed.

Note: Patient positioning based on right-handed surgeon.



Operative technique

Step 1: Initial release of the TMT joint

Open the PROstep Instrument Pack (57S1MI07). Using the blade and blade handle, make an incision over the first TMT joint. If planning for arthroscopy, this incision may be only 3-6mm long. If planning for direct visualization, this incision should be 8-12mm long. The level of the TMT joint can be identified by palpation or X-ray.

Use the blade to carefully release the medial capsule. Then use the straight elevator to free up the remaining TMT joint capsule. The metatarsal should be mobile enough to allow reduction of the IM angle and distraction of the TMT joint. If the metatarsal is already sufficiently hypermobile, this may not be needed.

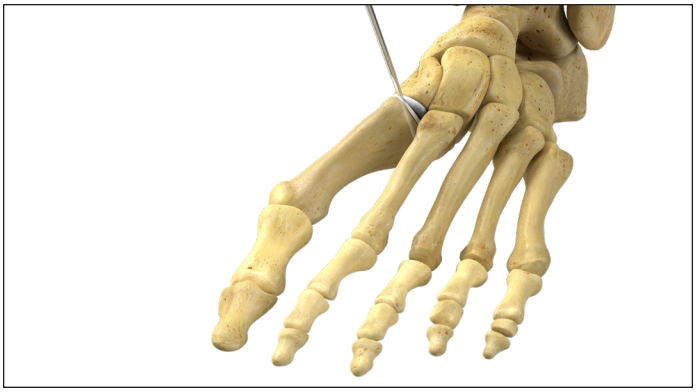


Figure 1
Initial release of the TMT joint

Step 2: Incision over the 2nd metatarsal metaphysis for clamp placement

Using the blade, make a small incision over the distal metaphysis of the second metatarsal. The extensor tendon should be lateral to the incision.

Optional, if needed:

Lateral release of the first MTP joint

A lateral release is done to allow sufficient correction of the hallux valgus angle and should be guided by palpation and X-ray.

Make a skin incision using the blade just lateral to the first MTP joint. Penetrate the joint with the blade and release the joint dorsally along the lateral capsule with care to stay on bone and avoid damaging the extensor tendons. Then, reverse the blade and cut the lateral capsule inferiorly, with care taken not to damage the lateral brevis tendon. The fibular-sesamoid-to-metatarsal-head ligament may also need to be released, as well as the adductor tendon lateral to the fibular sesamoid.

Pass the straight elevator into the space to ensure complete release of the lateral capsule. These actions will allow correction of the hallux valgus angle.

Figure 2
Lateral release of the first MTP joint

Step 3: Initial placement of the reduction clamp

Confirm that the IM angle and hallux valgus angle are reduceable from previous steps.

With the locking body medial and the hook lateral, insert the hook of the reduction clamp (57LPREDC) into the 2nd metatarsal incision. Push the hook plantar until it surrounds the lateral cortex of the 2nd metatarsal, and the lower horizontal bar is roughly at the level of the skin.

57LPREDC
Reduction clamp

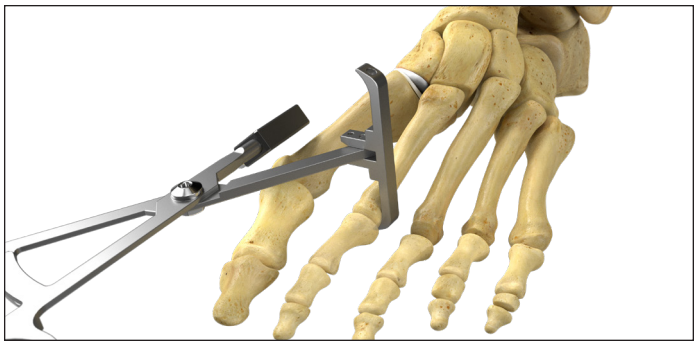


Figure 3
Initial placement of the reduction clamp

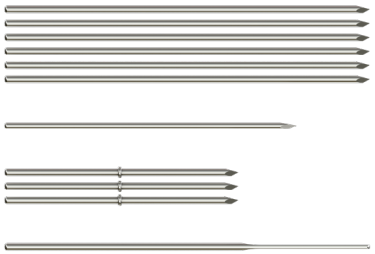
Figure 4
Initial placement of the reduction clamp

Step 4: Pinning to the 2nd metatarsal

Open the K-wire procedure pack (57KWPACK).

Note: If rotation needs to be corrected at the first metatarsal, supinate the reduction clamp until the vertical face of the hook is beyond true dorsal (the locking body should be elevated away from the foot somewhat).

Using the 1.6mm K-wire (the shortest smooth wire) from the pack, drive the wire through the angled hole on the lower horizontal bar of the hook until it passes through the metatarsal and through the other side of the hook.



57KWPACK
K-wire procedure pack

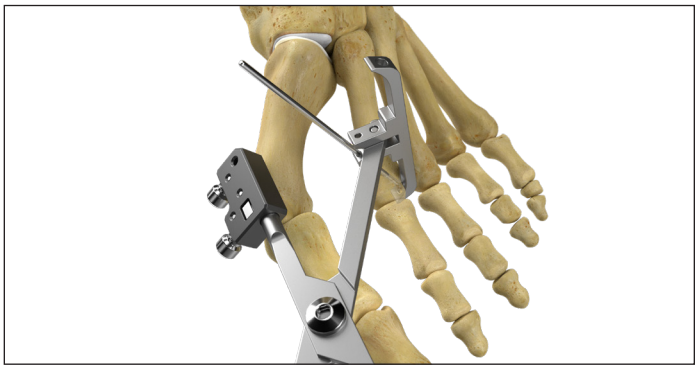


Figure 5
Pinning to the 2nd metatarsal

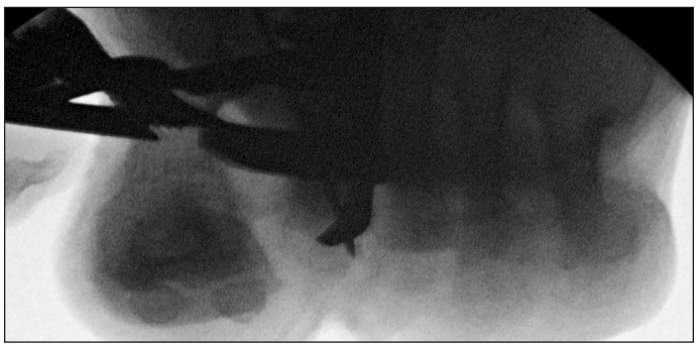


Figure 6
Pinning to the 2nd metatarsal

Step 5: Pinning to the 1st metatarsal

Open the clamp and position it so the locking body is dorsomedial to the 1st metatarsal head. Drive one of the smooth 2mm wires from the pack through the hole in the locking body and bicortically into the first metatarsal. The wire should be pre-angled medially based on the degree of needed angular correction of the first metatarsal (typically no more than 30° from true dorsal) and should exit just proximal to the sesamoids. The incision made for the medial eminence resection can be used for this K-wire placement.

Lock by tightening the proximal-most set screw using the Reusable T20 Driver (57LPDT20) and the Ratcheting Handle (58871010).

Note: To maximize available correction, it is ideal to place this wire plantar-medial to the center of the metatarsal. This will keep the wire on the medial half of the metatarsal once it is rotated to true dorsal, allowing the clamp to be closed further.

57LPDT20
Reusable T20 Driver

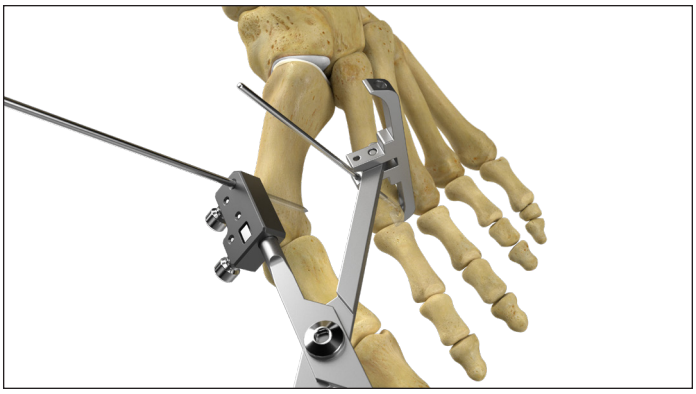


Figure 7
Pinning to the 1st metatarsal

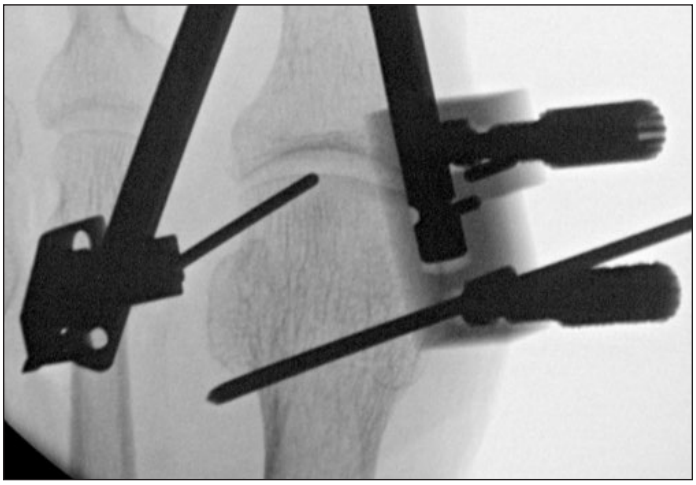


Figure 8
Exit proximal to the sesamoids

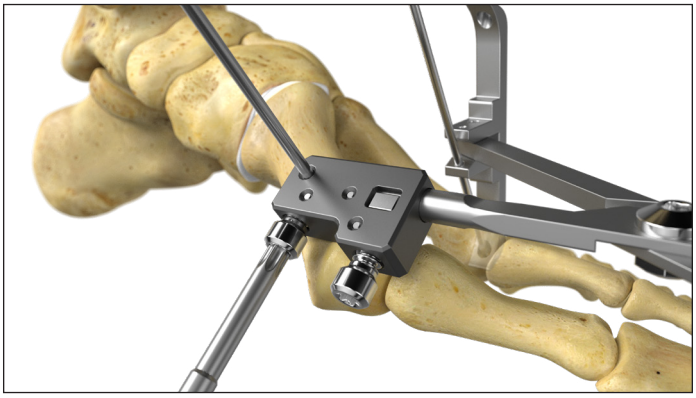


Figure 9
Lock proximal-most set screw

Step 6: Reduction of the IM angle

Close the clamp to reduce the IM angle so that there is 1-2mm of space between the first and second metatarsal on X-ray.

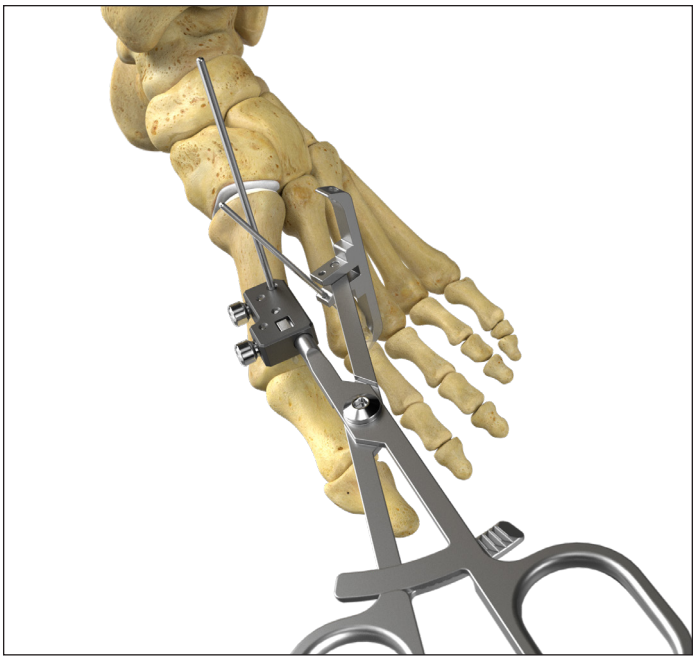


Figure 10
Reduction of the IM angle

Figure 11
Reduction of the IM angle

Step 7: Additional correction of rotation

Using the 2mm wire in the 1st metatarsal as a joystick, achieve any additional desired supination correction of the 1st metatarsal. The sesamoids should be reduced under the first metatarsal head when viewed on AP X-ray.

Lock this correction by tightening the distal-most set screw (the set screw **not** in line with the 2mm wire), using the Reusable T20 Driver (57LPDT20) and the ratcheting handle (58871010).

After correction rotation, if additional IM correction is now achievable and necessary, the clamp may be closed further.

If needed, adjust plantarflexion of the metatarsal by pulling it plantarly away from the clamp. The first metatarsal head should be 2-3mm below the lesser metatarsal heads. Once aligned appropriately, tighten the more proximal set screw to fully secure the metatarsal in the corrected position.

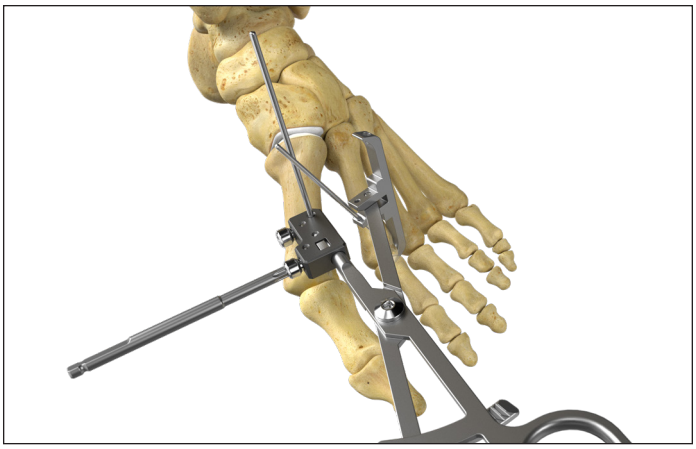


Figure 12
Additional correction of rotation

Figure 13
Reduced sesamoids

Step 8: Placing the joint seeking wire

Retrieve the joint seeking wire (blunt tips with a flat end) from the K-wire pack. Place the flat end of the wire into the center of the TMT joint so that the rest of the wire points dorsally out of the joint.

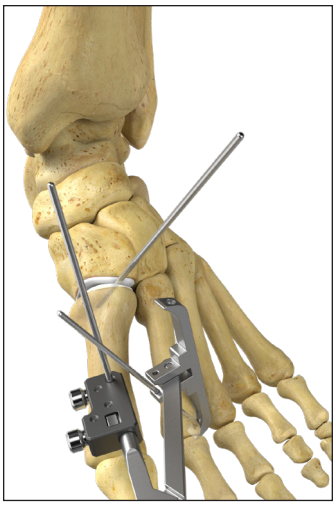


Figure 14
Placing the joint seeking wire

Figure 15
Placing the joint seeking wire

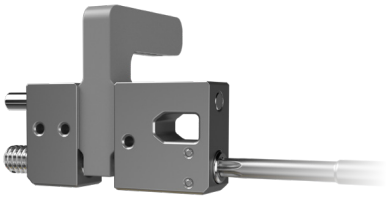
Step 9: Placement of the distractor-compressor

Assemble the distractor-compressor placement guide (57LPDCPG) and the distractor-compressor (57LPDSCP) by sliding the placement guide over the smooth dowel and then the lead screw of the distractor-compressor until it snaps in place. Then tighten the distractor-compressor over the placement guide with the Reusable T20 Driver.

Slide the placement guide over the joint seeking wire so the distractor-compressor is directly medial of the TMT joint. If there is a large gap between the distractor-compressor and the medial foot or if the distractor-compressor does not have room, adjust the placement guide hole selection accordingly. Ensure the rectangular window on lateral view is superimposed over the top half of the metatarsal.

57LPDCPG
Distractor-compressor
placement guide

57LPDSCP
Distractor-compressor



Distractor-compressor
put together

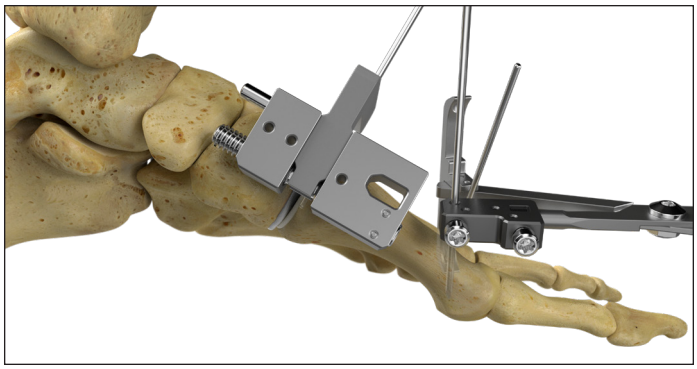


Figure 16
Placement guide over joint seeking wire

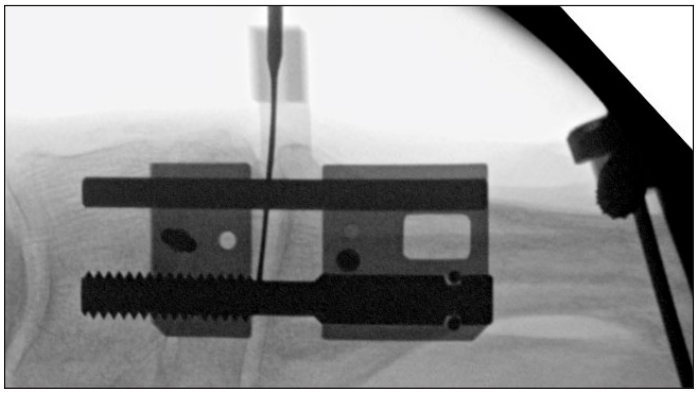


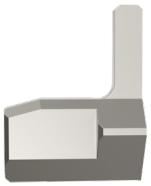
Figure 17
Rectangular window superimposed over the top half of the metatarsal

Step 10: Pinning around the 1st TMT joint

Place the distractor-compressor wire sleeve (57LPDCSL) in the window such that the bar is pointing distally (the triangular laser marks should point to each other).

Use a collared wire from the wire pack in the proximal-most hole to fix the distractor-compressor to the cuneiform. Fill the remaining 3 holes (including one from the wire sleeve) with 2mm wires from the wire pack.

Note: The two wires in the metatarsal wire cluster should stop short of the second metatarsal base.



57LPDCSL
Distractor-Compressor
wire sleeve

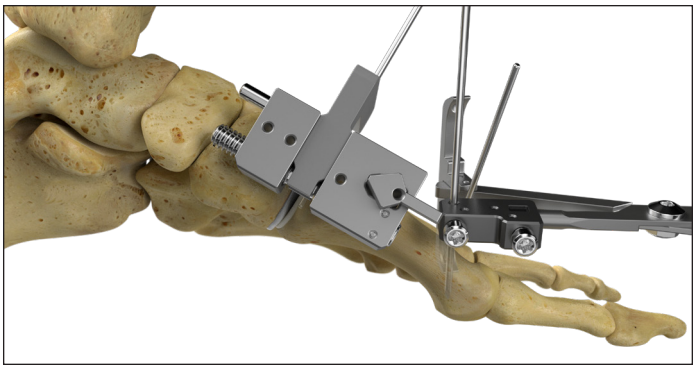


Figure 18
Placement of distractor-compressor wire sleeve

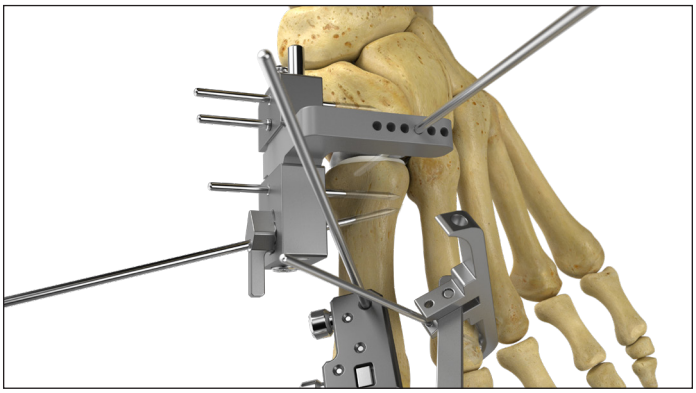


Figure 19
Pinning around the 1st TMT joint

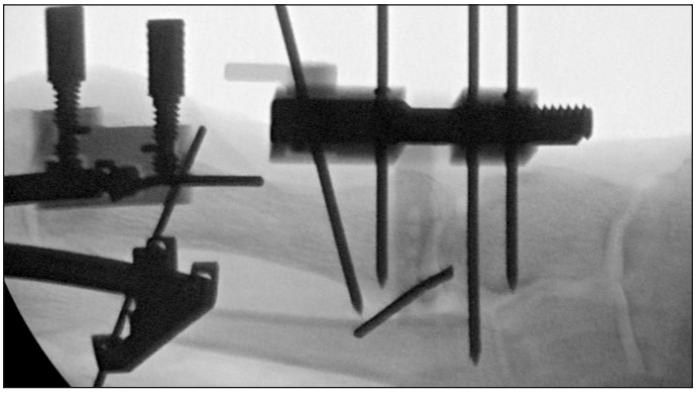


Figure 20
Pinning around the 1st TMT joint

Step 11: Distract the 1st TMT joint

Use the Reusable T20 Driver and the ratcheting handle to turn the distractor-compressor lead screw counter-clockwise to distract the TMT joint. The gap should be approximately 4mm.

If needed, perform additional release of the TMT joint capsule with the straight elevator.

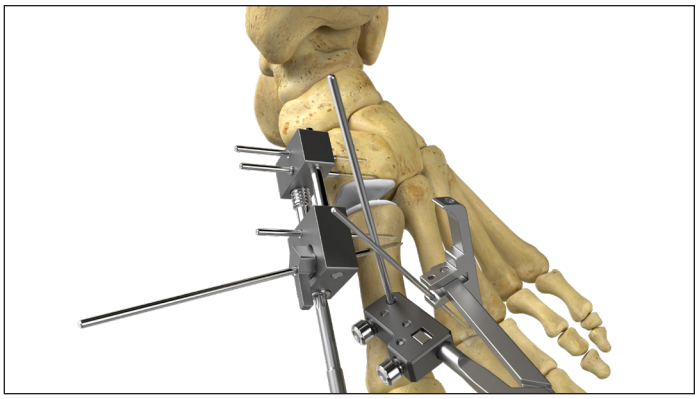


Figure 21
Distract the 1st TMT joint

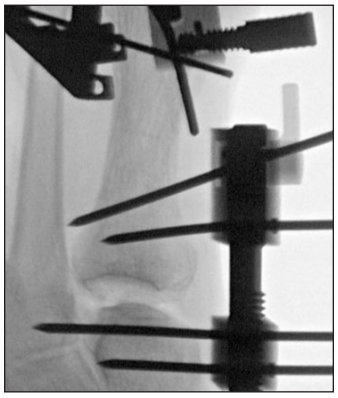


Figure 22
Distract the 1st TMT joint

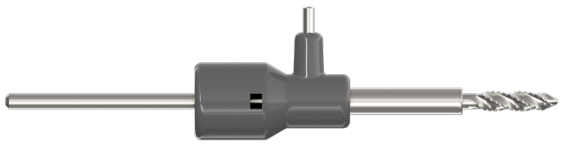
Step 12: Takedown of the joint cartilage

Assemble the appropriate irrigation sleeve (58PM2SLV for NSK Primado 2 units or 58TPXSLV for Stryker Core 2 units) over the tip of the available power system handpiece and place the 3mm × 12mm cartilage burr (58CC3012) into the collet through the irrigation sleeve cannula. Connect the irrigation tubing (PD-IT) to saline and to the irrigation sleeve. Set the irrigation flow rate to 100%.

Proceed with takedown of the joint cartilage using the burr. Perform the cartilage removal by sweeping back and forth on the articular surface at various depths. Palpate with the non-dominant hand and image frequently to verify that penetration into subchondral bone is being avoided, especially in osteopenic bone.

Note: With typical bone quality and without excessive force or speeds, the cartilage burr will tend to scrape away cartilage and bounce off the subchondral cortical bone, preserving the length of the first ray as much as possible.

Check the degree of cartilage removal periodically either via arthroscopy or direct visualization and be sure to remove any remaining cartilage patches. Check for and remove any loose cartilage fragments that may remain in the joint space using a pituitary rongeur or similar instrument. This step is important to avoid suboptimal joint fusion.



58PM2SLV
Irrigation sleeve for the PROstep handpiece
-or-
58TPXSLV
Irrigation sleeve for Stryker TPX handpiece

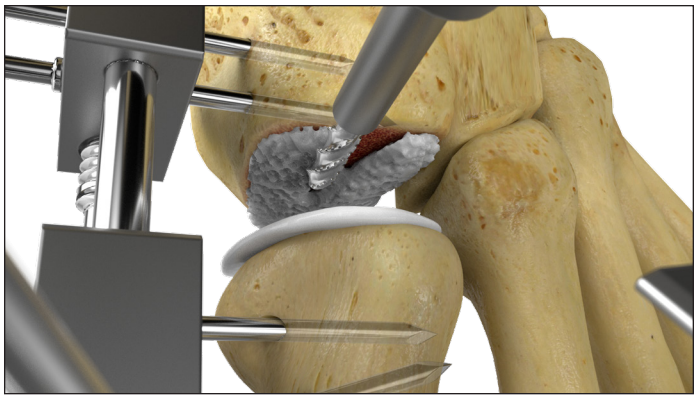


Figure 23
Takedown of the joint cartilage

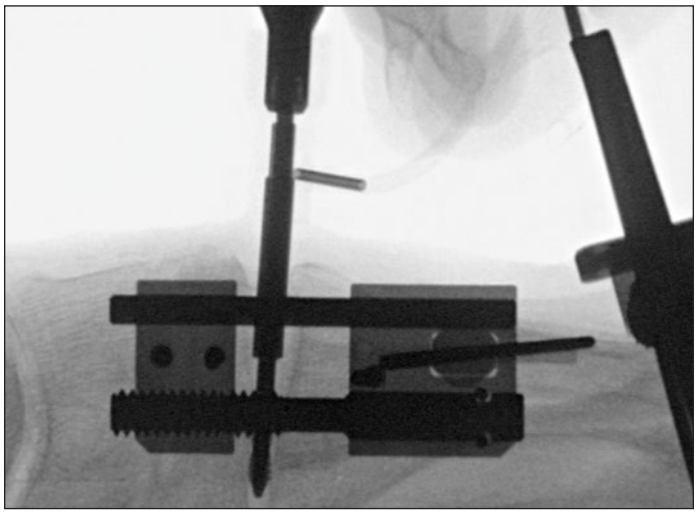


Figure 24
Takedown of the joint cartilage

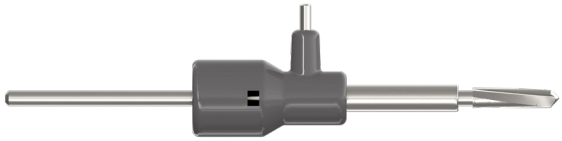
Step 13: Fenestration

Fenestrate both sides of the joint with the spherical burr (58RSPH40), the fenestration awl (58FENAWL), or another appropriate instrument.

If any reshaping of the cortical bone is needed, perform this reshaping now with a 3mm × 12mm sculpting burr (58SC3012) or the wedge burr.

58RSPH40
Cortical burr - sphere - 4mm burr

58FENAWL
Fenestration awl



58RW3113
Longer 3.1x13mm wedge burr

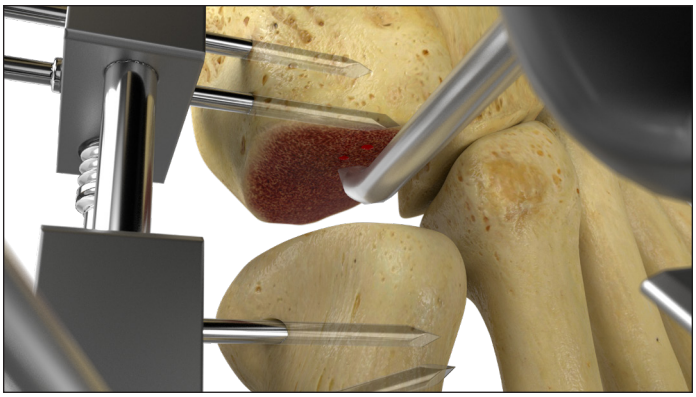


Figure 25
Fenestration

Step 14: Compression

With the joint fully prepared for arthrodesis, use the Reusable T20 Driver and the ratcheting handle once more to turn the distractor-compressor lead screw clockwise to compress the TMT joint. Continue until acceptable apposition and compression is attained. Check on X-ray that the previous reduction of the hallux valgus deformity is maintained after compression.

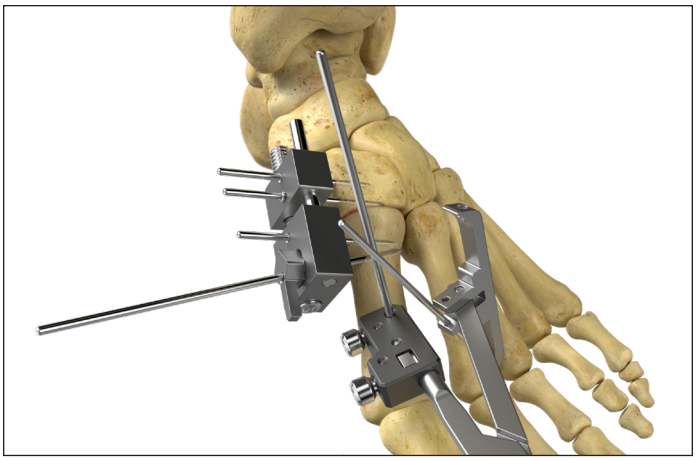


Figure 26
Compression

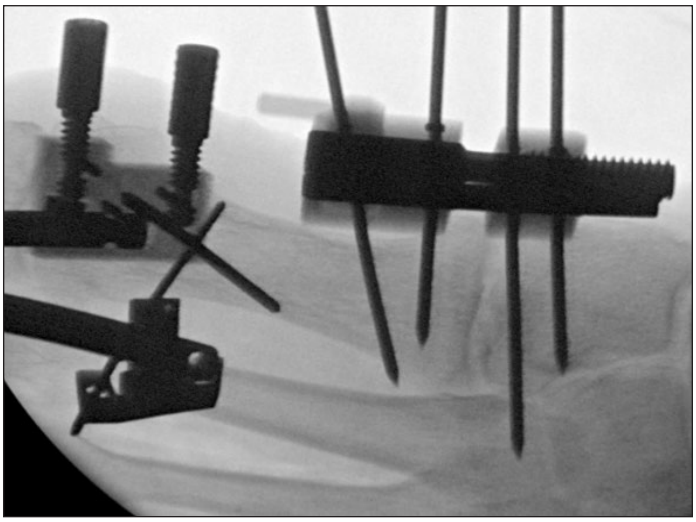
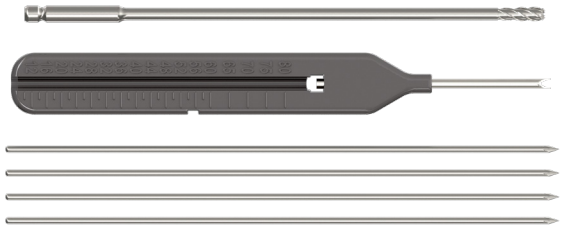


Figure 27
Compression

Step 15: Bone prep for trans-metatarsal screw

Drive the distal-most, angled 2mm wire into the second metatarsal base as a pilot hole, and then remove it entirely from the foot while leaving the distractor-compressor wire sleeve in place. Replace this removed wire with a 1.4mm wire (DSDS1014S) on the same trajectory, and then remove the wire sleeve. A small incision around this wire may be made through the open window in the distractor-compressor.

Open the drill and depthing pack (57DRDEP5) and retrieve the depth gauge to depth the needed screw length. Next, retrieve the pre-drill for a 4mm MICA Screw (57S00030) and drill across both cortices of both the first and second metatarsal.



57DRDEP5
Drill and depthing pack

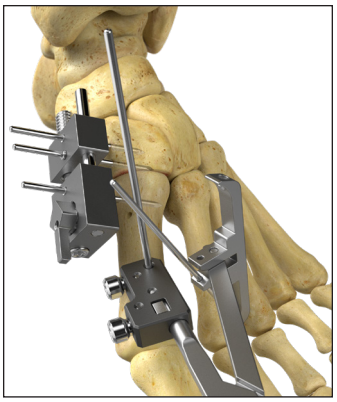


Figure 28
Bone prep for trans-metatarsal screw

Figure 29
Bone prep for trans-metatarsal screw

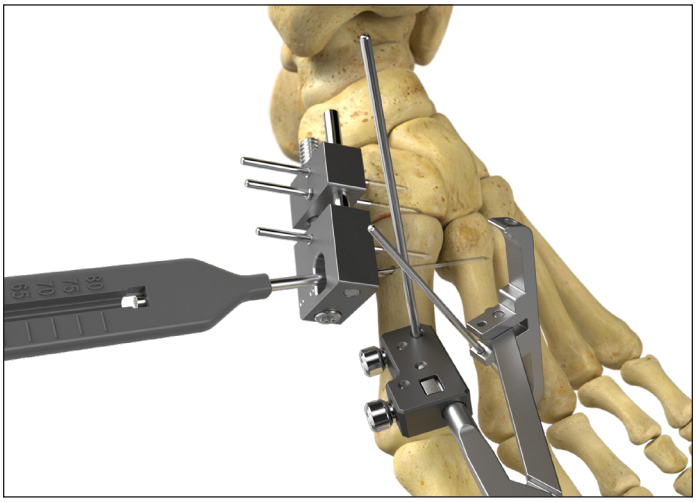


Figure 30
Depth gauge for screw length

Step 16: Insertion of trans-metatarsal screw

Next, retrieve the appropriate length 4mm MICA screw (57S340##) and driver (57S02025). Drive the Screw over the 1.4mm guide wire until the screw head is appropriately seated on the medial cortex of the first metatarsal. In the medial-lateral view on X-ray, the screw should be situated in the dorsal third of the first metatarsal and enter roughly into the proximal metaphysis of the second metatarsal.

Note: If it does not impede any desired steps, it is recommended to temporarily leave the 1.4mm guide wire in place in the 4mm MICA Screw, as it will be referenced by an instrument later in the procedure.

Note: Single cortex fixation may be preferred in smaller patients to minimize possibility of stress fracture where the screw enters the second metatarsal.

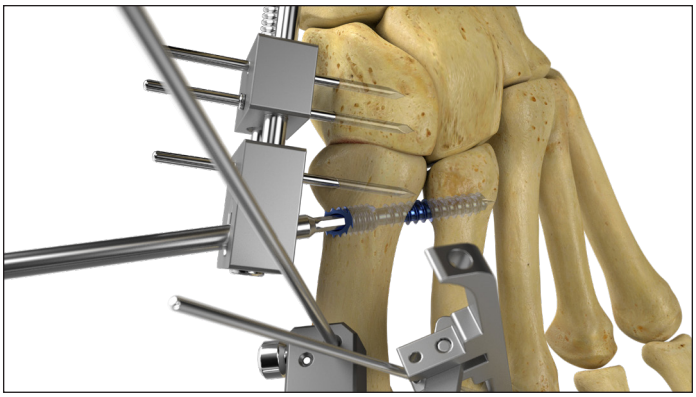


Figure 31
Insertion of trans-metatarsal screw

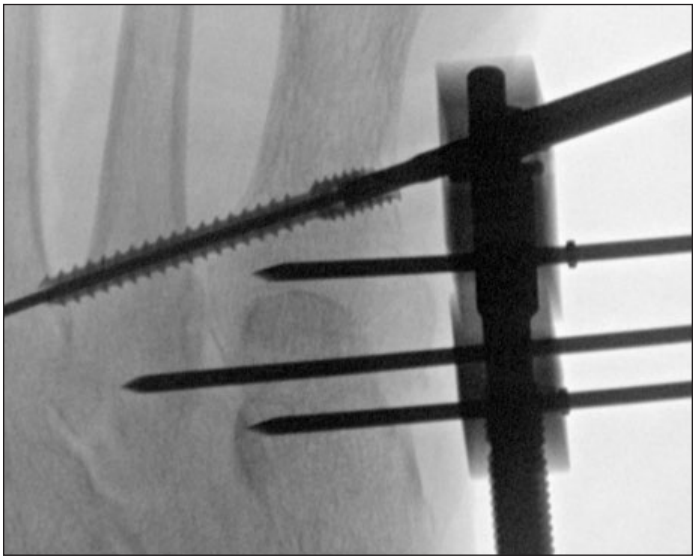


Figure 32
4mm MICA screw position

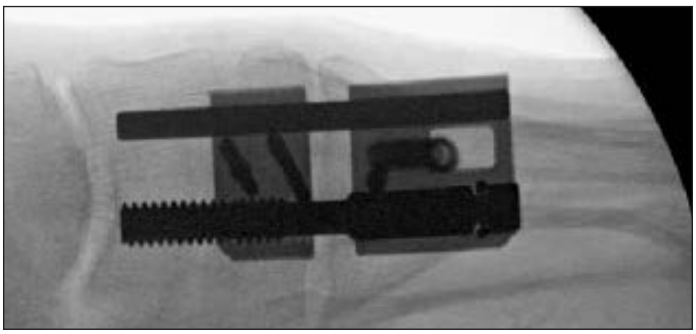


Figure 33
4mm MICA screw position

Step 17: Removal of reduction clamp

With the distractor-compressor still in place and the trans-metatarsal fixation in place, the reduction clamp may now be removed from the foot. Loosen both set screws from the clamp, remove the 2mm K-wire in the first metatarsal, and remove the 1.6mm K-wire in the second metatarsal. The clamp may now be removed.

Step 18: Placing the targeting wire for the screw targeting guide

Drive a 2mm K-wire into the most plantar-proximal corner of the medial cuneiform, keeping it roughly parallel to the weightbearing surface of the foot.

Note: Use palpation to locate the plantar-proximal corner of the cuneiform prior to insertion to ensure the wire is placed as far plantar and as far proximal as possible while maintaining stability in the bone.

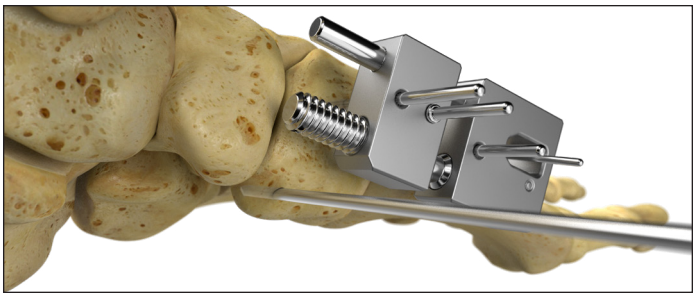


Figure 34
Placing the targeting wire for the screw targeting guide

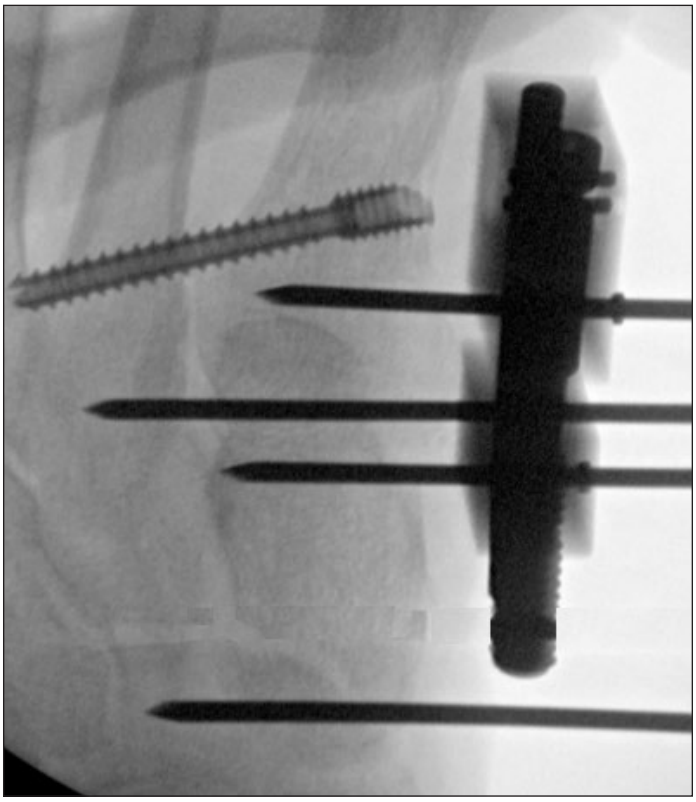


Figure 35
Placing the targeting wire for the screw targeting guide

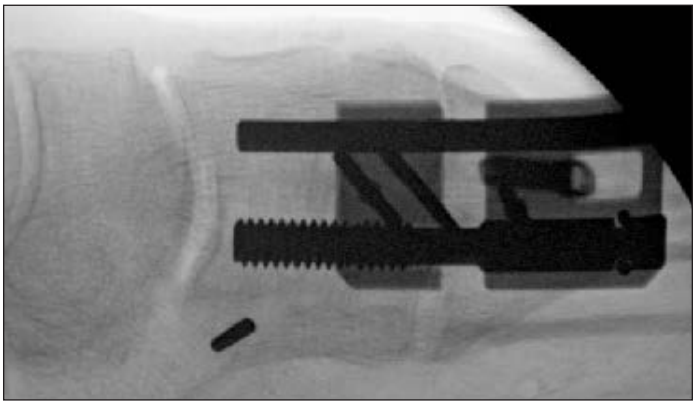


Figure 36
Placing the targeting wire for the screw targeting guide

Step 19: Placement of the screw targeting guide

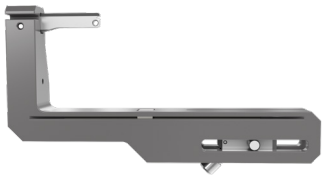
Make a dorsal incision over the first metatarsal head starting at the beginning of the dorsal metatarsal metaphyseal flare and continuing distally for 1cm-1.5cm.

In most cases, prior to placement of the screw targeting guide, the wires in the distractor-compressor will need to be trimmed with a pin cutter to within 2cm of stick-out.

Caution: Do not trim the standalone targeting wire placed in the previous step.

Retrieve the left-foot or right-foot variant of the screw targeting guide (57LPSTGL or 57LPSTGR, respectively). Slide the proximal anchor end of the instrument over the targeting K-wire in the medial cuneiform and leave the locking set screw loose. At the same time, insert the exposed metal wire guide tip into the dorsal metatarsal incision. The extensor hallucis tendon(s) may need to be retracted medially or laterally to accomplish this.

Orient the tip such that the hole visible on X-ray is centered on the first metatarsal and slide the tip distally until it just touches the start of the dorsal flare.



57LPSTGL and 57LPSTGR
Screw targeting guide left and right

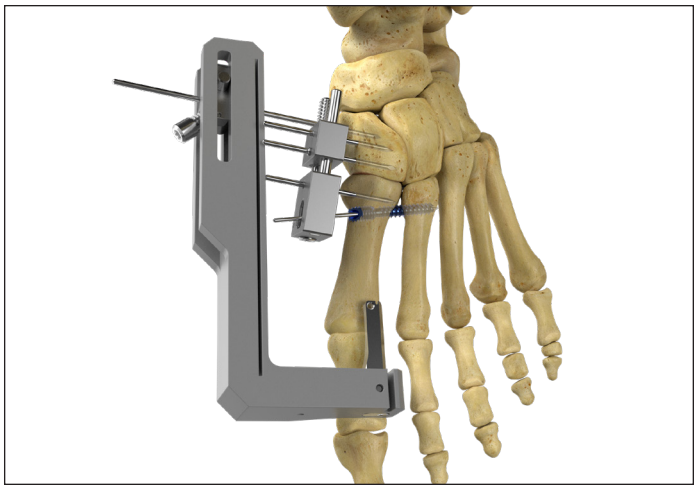


Figure 37
Placement of the screw targeting guide

Figure 38
Placement of the screw targeting guide

Figure 39
Metal tip orientation on x-ray

Step 20: Anchoring the screw targeting guide to the distal 1st metatarsal

Ensure the metal tip of the screw targeting guide is fully in the dorsal incision, ensure no skin is impinged by the metal tip, and ensure the extensor tendons remain retracted. Retrieve a collared wire from the wire pack and drive it in the hole over the first metatarsal until it is fully seated and the metal tip is held down securely against the dorsal cortex.

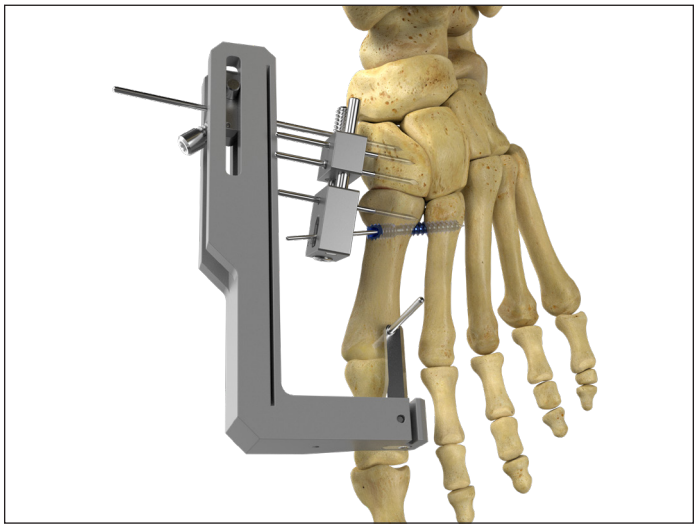


Figure 40
Anchoring the screw targeting guide

Step 21: Indicating the trajectory of the targeting guide

The joint seeking wire may be used as an X-ray indicator when it is laid in the slot on the screw targeting guide just distal to the metal tip and over the dorsal foot.

There are two long radiopaque markers embedded in the long arm of the screw targeting guide. When these two markers overlap and appear to be a single marker on X-ray, the X-ray view is aligned with the device, and the trajectory shown by the joint seeking wire is accurate.

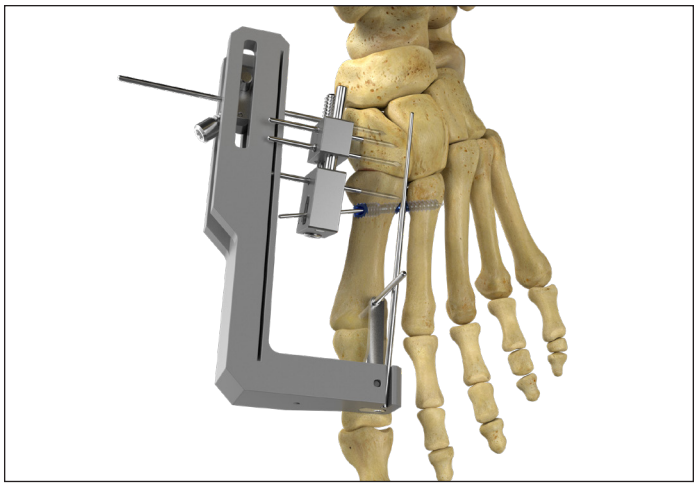


Figure 41
Indicating the trajectory of the targeting guide

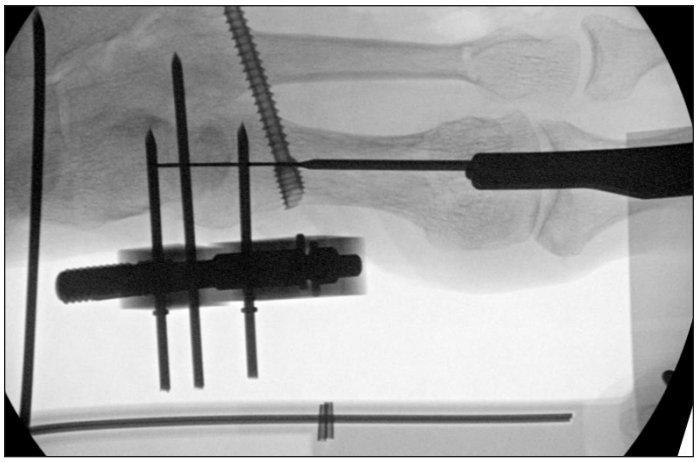


Figure 42
Radiopaque markers

Step 22: Adjusting the trajectory of the targeting guide

With the locking set screw loose, the entire screw targeting guide may be rotated about the collared wire in the dorsal metatarsal to adjust where along the targeting wire the indicated trajectory is aiming. With the joint seeking wire in place, these trajectory adjustments may be visualized in real time. A preferred trajectory tends to be slightly medial to the center of the cuneiform in a true AP view to ensure the whole screw remains within the cuneiform.

Once a desirable trajectory is achieved, it may be locked by tightening the locking set screw on the medial screw targeting guide.

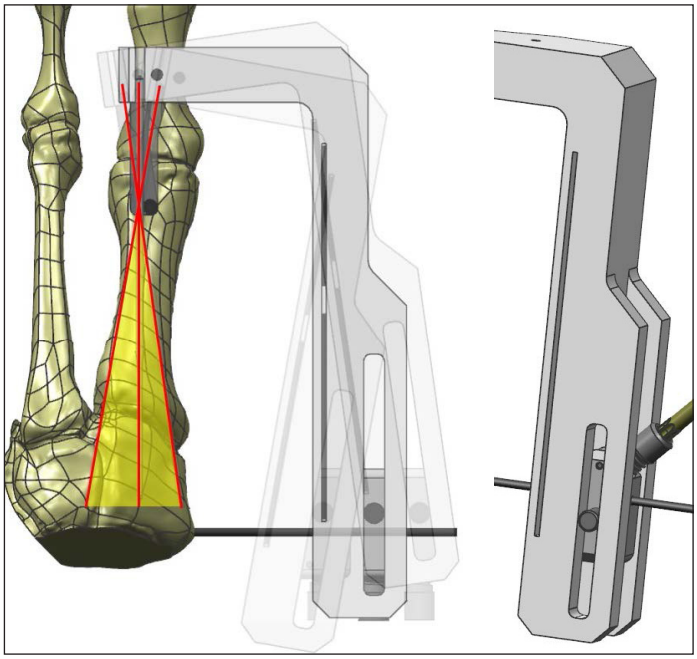


Figure 43
Adjusting the trajectory of the targeting guide

Step 23: Placing the 1.8mm wire

Retrieve the 1.8mm guide K-wire from the drill and depthing pack. With the desired trajectory locked and confirmed on fluoroscopy, drive the wire from distal to proximal through the metal tip of the screw targeting guide and into the first metatarsal and medial cuneiform. Once the 1.8mm wire approaches the targeting 2mm wire in the cuneiform, stop inserting and check the trajectory of the 1.8mm wire in AP and ML views.

If the trajectory is acceptable, loosen the locking set screw on the screw targeting guide, remove the collared wire, remove the targeting 2mm wire, and remove the screw targeting guide. Continue driving the 1.8mm wire until it is driven to the farthest plantar-proximal corner of the cuneiform.

Note: A burr may be used for a pilot hole to resist skiving of the 1.8mm wire.

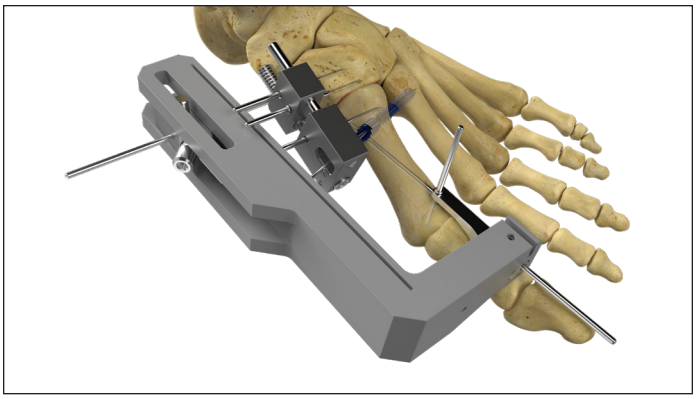


Figure 44
Placing the 1.8mm wire

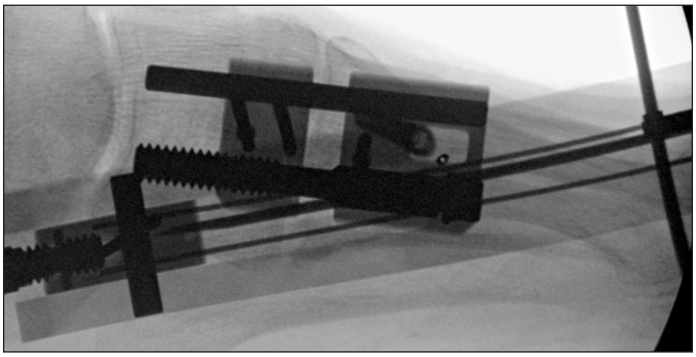


Figure 45
Lateral trajectory

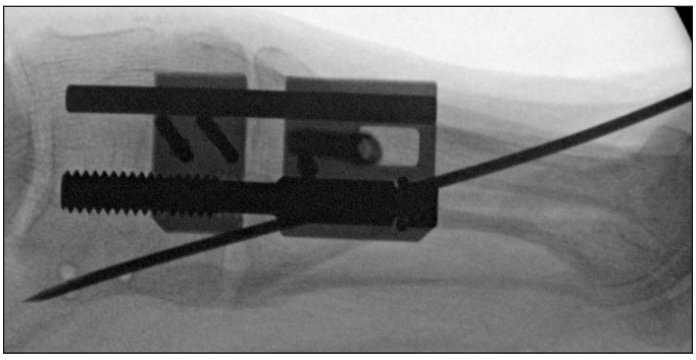
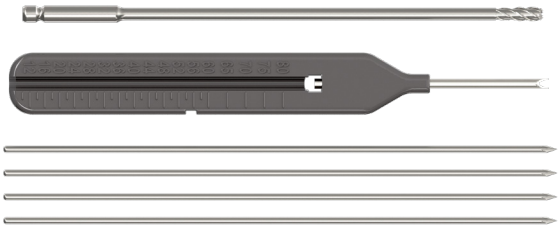


Figure 46
Medial lateral trajectory

Step 24: Bone prep for PROstep MIS 5mm Chamfer Screw

Use the depth gauge from the drill and depthing pack once more to measure the length of the needed PROstep MIS 5mm Chamfer Screw (57S050XX). Retrieve the 3.5mm drill from the drill and depthing pack and the chamfered tissue protector (57LPTP50).

Insert the chamfered tissue protector in the incision over the 1.8mm wire and leave it in place until after screw insertion. Drill the screw pilot hole with the 3.5mm drill through at least three cortices.



57DRDEP5
Drill and depthing pack
for 5mm chamfer screw

57LPTP50
Chamfered tissue protector

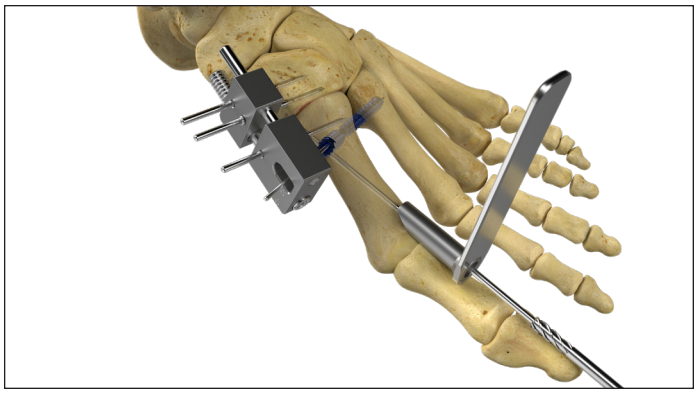


Figure 47
Bone prep for 5mm chamfer screw

Step 25: Insertion of the PROstep MIS 5mm chamfer screw

Using the Reusable T20 Driver, insert the PROstep MIS 5mm Chamfer Screw until the chamfered head is flush with the dorsal metatarsal cortex. Verify this with lateral X-ray and with direct palpation in the dorsal metatarsal incision.

Caution: Ensure the cutting end of the screw does not damage the extensor hallucis tendons.

Once the 5mm screw is inserted and confirmed to be acceptable, the tissue protector and the distractor-compressor may be removed. To remove the distractor-compressor, first loosen the lead screw to relieve tension, then remove the remaining 2mm wires and collared wire.

Leave the 1.8mm wire in place.

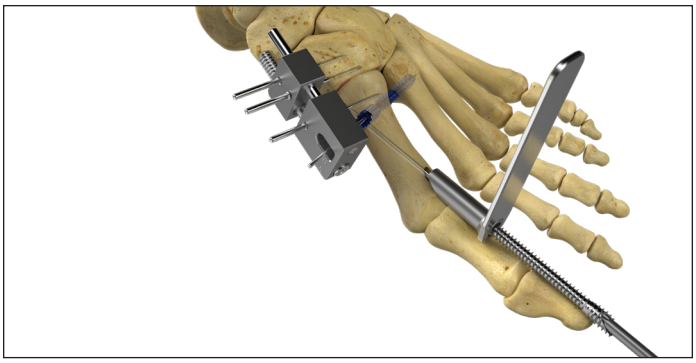


Figure 48
Insertion of 5mm chamfer screw

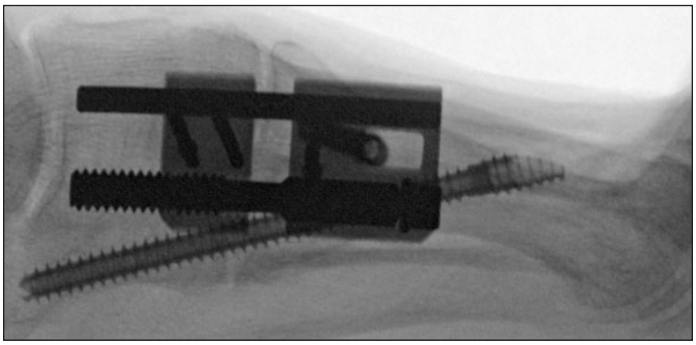


Figure 49
Lateral x-ray

Step 26: Targeting for the keystone anchoring screw

Retrieve the left-foot or right-foot variant of the keystone targeting guide (57LPKTGL or 57LPKTGR, respectively). If the 1.4mm guide wire for the trans-metatarsal screw was removed, reinsert this guide wire into the screw cannula. Slide the keystone targeting guide over the 1.4mm wire through the orthogonal hole, and ensure the arm of the guide is contacting the protruding 1.8mm wire still within the 5mm screw.

With the guide pushed against the foot, the oblique hole provides a 3rd trajectory, which targets the intermediate cuneiform through the first metatarsal and medial cuneiform.

Retrieve an additional 1.4mm K-wire and drive it through the oblique hole of the keystone targeting guide.

Note: This trajectory may also be attained manually if the patient anatomy prevents the guide from providing an appropriate trajectory.

57LPKTGL or 57LPKTGR
Left keystone targeting guide
-or-
Right keystone targeting guide

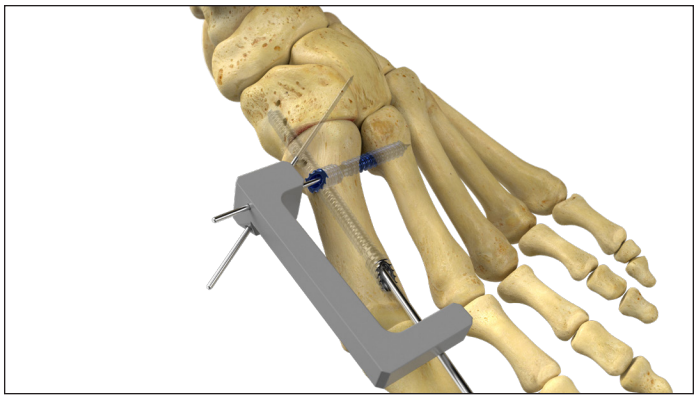


Figure 50
Targeting for the keystone anchoring screw

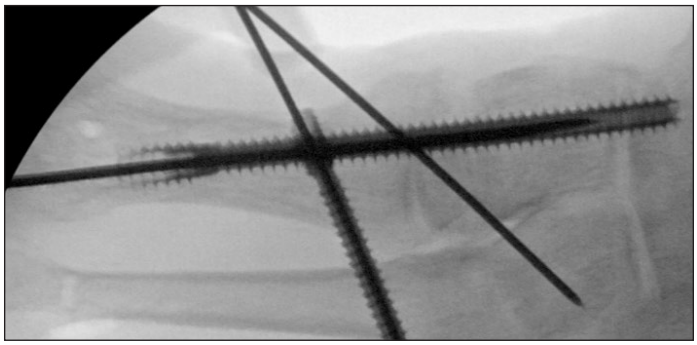


Figure 51
Targeting for the keystone anchoring screw

Step 27: Placing the keystone anchoring screw

With the final 1.4mm guide wire in place, remove the trans-metatarsal 1.4mm guide wire, remove the keystone targeting guide, and make a small incision around the 1.4mm guide wire.

Retrieve the depth gauge once more to depth the needed screw length. Next, retrieve once more the pre-drill for a 4mm MICA screw and drill across at least 5 cortices.

Finally, retrieve the 4mm MICA screwdriver once more and drive the appropriate length of 4mm MICA screw over the 1.4mm guide wire until it is flush with the medial cortex of the first metatarsal. Verify this with AP X-ray and with manual palpation. Once good screw placement is confirmed, remove the 1.4mm wire.

Check for any remaining deformity within the hallux and consider performing an Akin osteotomy if needed.

Close all incisions as needed.

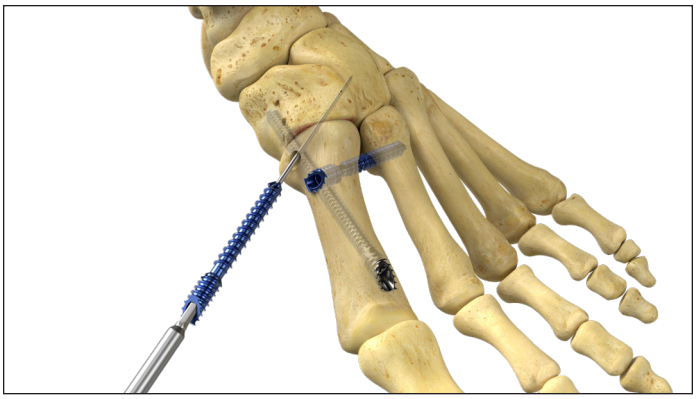


Figure 52
Placing the Keystone Anchoring Screw

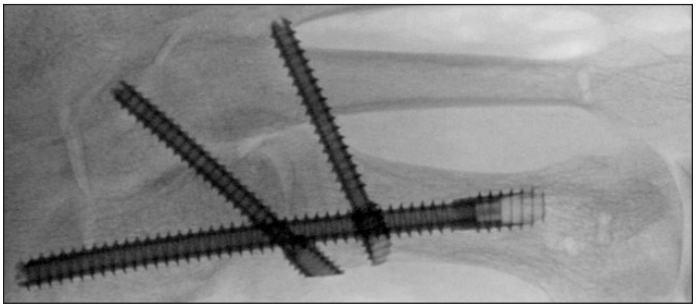


Figure 53
AP x-ray

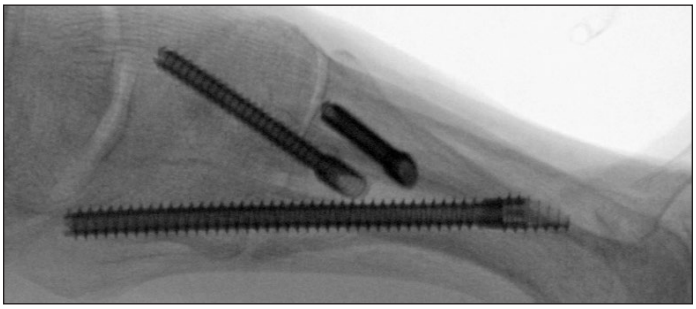


Figure 54
Lateral x-ray

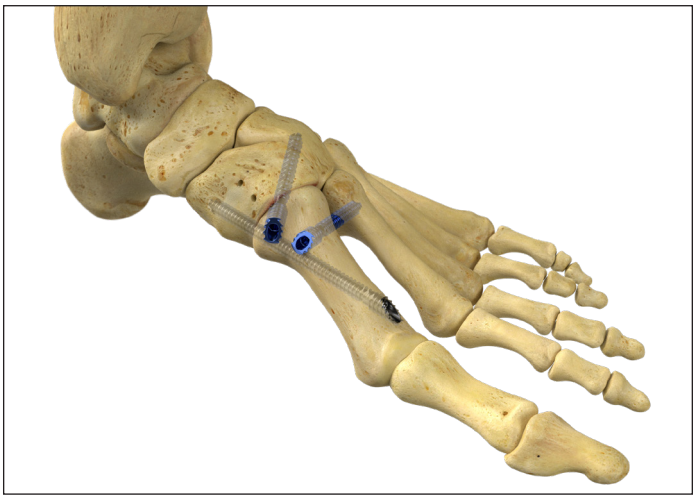


Figure 55
Final construct

Optional, if needed:

Medial eminence resection

If the hallux valgus deformity includes a substantial medial eminence, the eminence may be mobilized and resected using a 3.1mm wedge burr (58RW3113).

Make an incision dorsal to the medial eminence and 10mm proximal to the first MTP joint line. Plunge the burr plantar-distally into the medial eminence and continue insertion until confirming full penetration by palpation. Verify correct placement with X-ray, and then burr distally into the joint space just lateral to the sagittal groove. Ensure consistent guidance by palpation and by X-ray in multiple planes while cutting. Once through, begin burring proximally, ending the cut medial to the diaphysis. This cut frees a chunk of medial bone containing the medial capsule insertion and the bulk of the medial eminence. Reduce the width of the medial eminence using the burr and external medial pressure on the bone chunk. Leave a small disk of bone attached to the medial capsule to assist in capsule reattachment to the metatarsal. After correcting the hallux valgus deformity in later steps, migrate the disk of bone and the medial capsular insertion proximally to effectively tighten the medial capsule. Hold this tightened position of the medial capsule insertion with appropriate dressings after the procedure is complete.

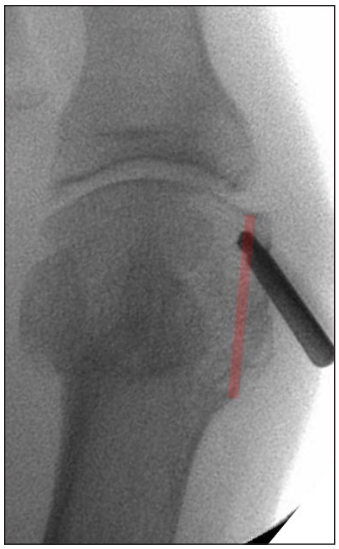


Figure 56
Lateral release of the first MTP joint

Note: Thoroughly flush any bone debris out of the MTP joint space.

Pearl – Even if no medial eminence resection is needed, it still may be helpful to free the medial capsule attachment as described above to allow it to heal in a tightened position.

Explant information

Removal of the 4mm MICA Screws may be performed by using the 2.5mm hex driver (57S02025).

Removal of the PROstep MIS 5mm Chamfer Screws may be performed by using the Reusable T20 Driver (57LPDT20 or 57DRVT20).

If removal of the implant is required due to revision or failure of the device, the surgeon should contact the manufacturer using the contact information located on the back cover of this operative technique to receive instructions for returning the explanted device to the manufacturer for investigation.

Ordering information

Kits for Lapidus procedure

Part no.	Description
57LPKITA	PROstep MIS Lapidus Consumables Kit
57LPKIT1	PROstep MIS Lapidus Instrument Kit

PROstep MIS 5mm Chamfer Screws

Part no.	Description
57S05030	PROstep MIS 5mm × 30mm Chamfer Screw
57S05032	PROstep MIS 5mm × 32mm Chamfer Screw
57S05034	PROstep MIS 5mm × 34mm Chamfer Screw
57S05036	PROstep MIS 5mm × 36mm Chamfer Screw
57S05038	PROstep MIS 5mm × 38mm Chamfer Screw
57S05040	PROstep MIS 5mm × 40mm Chamfer Screw
57S05042	PROstep MIS 5mm × 42mm Chamfer Screw
57S05044	PROstep MIS 5mm × 44mm Chamfer Screw
57S05046	PROstep MIS 5mm × 46mm Chamfer Screw
57S05048	PROstep MIS 5mm × 48mm Chamfer Screw

Part no.	Description
57S05050	PROstep MIS 5mm × 50mm Chamfer Screw
57S05052	PROstep MIS 5mm × 52mm Chamfer Screw
57S05054	PROstep MIS 5mm × 54mm Chamfer Screw
57S05056	PROstep MIS 5mm × 56mm Chamfer Screw
57S05058	PROstep MIS 5mm × 58mm Chamfer Screw
57S05060	PROstep MIS 5mm × 60mm Chamfer Screw
57S05065	PROstep MIS 5mm × 65mm Chamfer Screw
57S05070	PROstep MIS 5mm × 70mm Chamfer Screw
57S05075	PROstep MIS 5mm × 75mm Chamfer Screw
57S05080	PROstep MIS 5mm × 80mm Chamfer Screw

Ordering information (continued)

PROstep 4mm MICA Screws

Part no.	Description
57S34020	PROstep 4mm × 20mm MICA Screw
57S34022	PROstep 4mm × 22mm MICA Screw
57S34024	PROstep 4mm × 24mm MICA Screw
57S34026	PROstep 4mm × 26mm MICA Screw
57S34028	PROstep 4mm × 28mm MICA Screw
57S34030	PROstep 4mm × 30mm MICA Screw
57S34032	PROstep 4mm × 32mm MICA Screw
57S34034	PROstep 4mm × 34mm MICA Screw
57S34036	PROstep 4mm × 36mm MICA Screw
57S34038	PROstep 4mm × 38mm MICA Screw
57S34040	PROstep 4mm × 40mm MICA Screw

Part no.	Description
57S34042	PROstep 4mm × 42mm MICA Screw
57S34044	PROstep 4mm × 44mm MICA Screw
57S34046	PROstep 4mm × 46mm MICA Screw
57S34048	PROstep 4mm × 48mm MICA Screw
57S34050	PROstep 4mm × 50mm MICA Screw
57S34052	PROstep 4mm × 52mm MICA Screw
57S34054	PROstep 4mm × 54mm MICA Screw
57S34056	PROstep 4mm × 56mm MICA Screw
57S34058	PROstep 4mm × 58mm MICA Screw
57S34060	PROstep 4mm × 60mm MICA Screw

PROstep Consumable Instrumentation used in Lapidus procedure

Part no.	Description
57S1MI07	PROstep Instrument Pack
57KWPACK	PROstep MIS Lapidus K-wire Pack
58PM2SLV	Irrigation sleeve for primado 2
58TPXSLV	Irrigation sleeve for core 2
58CC3012	Cartilage burr – cylinder 3mm × 12mm
58SC3012	Sculpting burr – cylinder 3mm × 12mm
58CF4008	Cartilage burr – flame 4mm × 8mm

Part no.	Description
58RSPH40	Cortical burr – sphere
58RW3113	Cortical burr – wedge 3.1mm × 13mm
58FENAWL	Curved fenestration awl
57DRDEP5	Drill and depthing pack 5mm
DSDS1014S	1.4mm MICA Wire
57S00030	Drill for 4mm MICA Screw
57S02025	Driver for 4mm MICA Screw

Ordering information (continued)

PROstep MIS Lapidus Reusable Instrument Kit

Part no.	Description
57LPREDC	Hallux valgus reduction clamp
57LPDT20	Reusable T20 driver
57LPDCPG	Dist-comp placement guide
57LPDSCP	Distractor-compressor
57LPDCSL	Dist-comp wire sleeve
57LPSTGL	Screw targeting guide left

Part no.	Description
57LPSTGR	Screw targeting guide right
57LPTP50	Chamfered tissue protector
57LPKTGL	Keystone targeting guide left
57LPKTGR	Keystone targeting guide right
58871010	Ratcheting AOQC handle

Notes

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Foot & Ankle

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