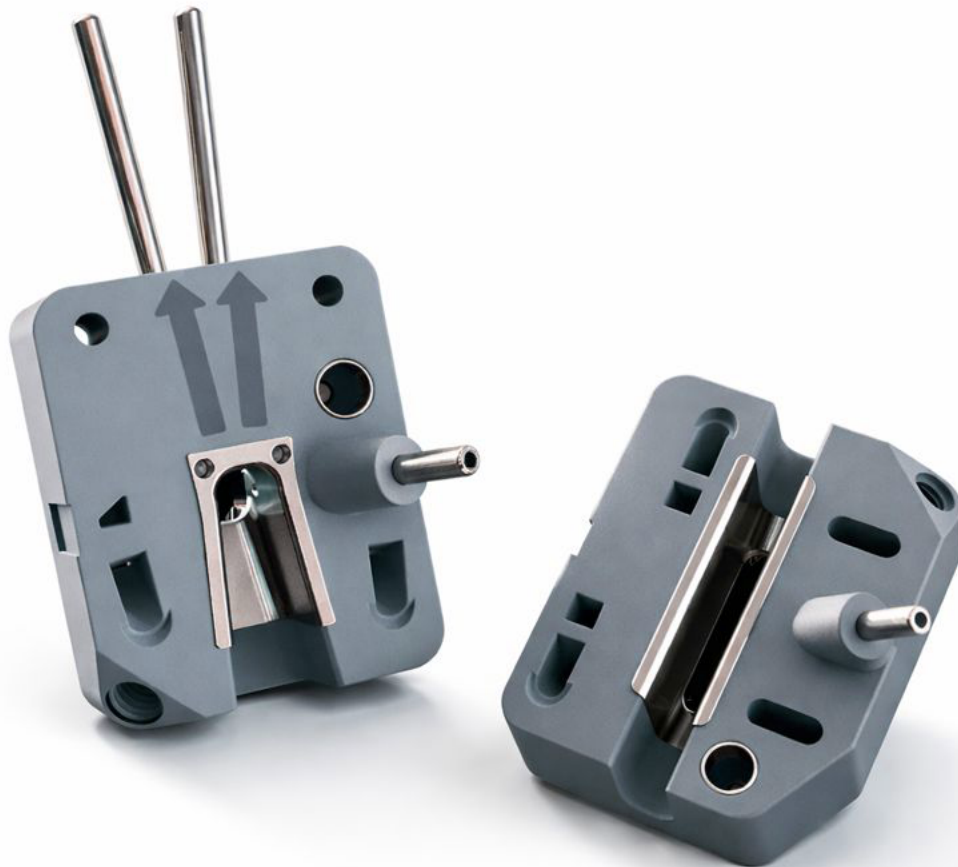


PROstep[®]

Calcaneal Guides

Transverse and Zadek Osteotomies

Operative technique



Important

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.

Please remember that the compatibility of different product systems has not been tested unless specified otherwise in the product labeling. Consult Instructions for Use (www.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.

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Introduction

The PROstep MIS procedure guide calcaneal osteotomy is comparable to the open technique, but performed through a minimally invasive incision, using a cutting burr with a diameter of 3mm and a working length of 20mm (57SC320L).

This could be in the case of a patient suffering with a flatfoot deformity or a posterior tibial tendon dysfunction (PTTD) or Haglund's deformity.

This procedure will require fixation of the osteotomy. The decision of the appropriate implant is the responsibility of the healthcare provider.

Indications and contraindications

Indications

Transverse Guide

The PROstep Transverse Calcaneal cut guide is intended for patients with a varus or valgus hindfoot deformity requiring a medial or lateral displacement osteotomy.

Zadek Guide

The PROstep Zadek Calcaneal cut guide is intended for patients with insertional Achilles tendinosis who will be treated with a realignment closing wedge osteotomy of the calcaneus.

Contraindications

The physician's education, training, and professional judgment must be relied upon to choose the most appropriate device and treatment. Conditions presenting an increased risk of failure include:

- Any active or suspected latent infection or marked local inflammation in or about the affected area;
- Compromised vascularity that would inhibit adequate blood supply to the operative site;
- Bone stock compromised by disease, infection or prior implantation that cannot provide adequate support and / or fixation of the devices;
- Material sensitivity, documented or suspected;
- Patients having inadequate tissue coverage over the operative site;
- Implant utilization that would interfere with anatomical structures or physiological performance;
- Any mental or neuromuscular disorder which would create an unacceptable risk of fixation failure or complications in postoperative care;
- Other medical or surgical conditions which would preclude the potential benefit of surgery.

Users of this device should be familiar with the full labeling (e.g. Instructions for Use, Operative Technique, etc.) for each applicable product and should avail themselves of all publications offered. Please contact Stryker and/or the legal manufacturer, if further information on this product is needed.

Patient positioning and set-up

NOTICE

Patient positioning based on right-handed health care professional.

The patient's feet should be positioned off the end of the table, enabling ease of access for the X-ray, thereby allowing for consistent X-rays throughout the procedure. **(Figure 1)**

Small fluro patient position Supine

The patient is positioned supine with the operative side in a slightly elevated lateral position. This allows for a slight inward rotation of the foot.

Large fluro patient position Supine

The patient is positioned supine with the operative leg on a stable surface. The surface can be either blankets or foam that elevates the operative leg above the opposite leg. This makes viewing the calcaneus in a constant lateral projection feasible.

Lateral decubitus

The patient is positioned in the lateral decubitus with beanbag support. Support the leg on a stable surface, such as blankets or foam.

The X-ray itself should come in from the patient's right and should be rotated to a slight oblique angle. **(Figure 2)**

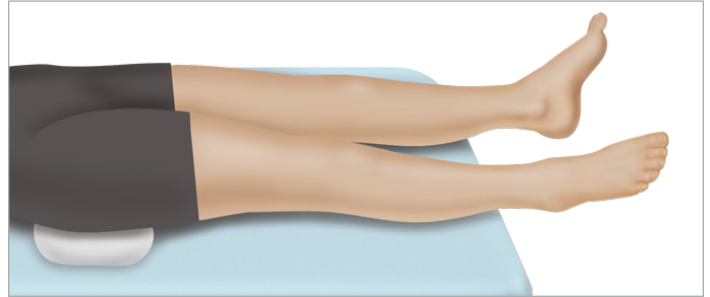


Figure 1



Figure 2

Patient positioning and set-up

The PROstep Power Box can then be positioned to the patient's left. **(Figure 3)**

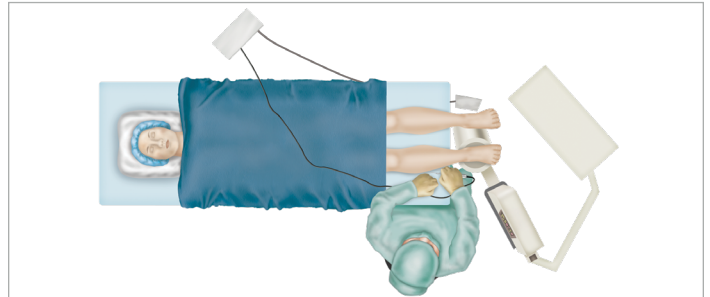


Figure 3

This set-up enables free movement around the patient's feet, to either stand at the side or the end of the table as the operation demands. The position of the equipment is independent of whether the operative side is left or right. **(Figure 4)**



Figure 4

Operative technique

Surgical approach

The patient is positioned supine in a slightly elevated lateral position on the side to be operated on. This allows for a slight inward rotation of the foot. The recommended surgeon position and X-ray position are as shown. The X-ray is positioned under the foot so that the surgeon can easily obtain a lateral view of the calcaneus when required without moving the foot. **(Figure 5)**

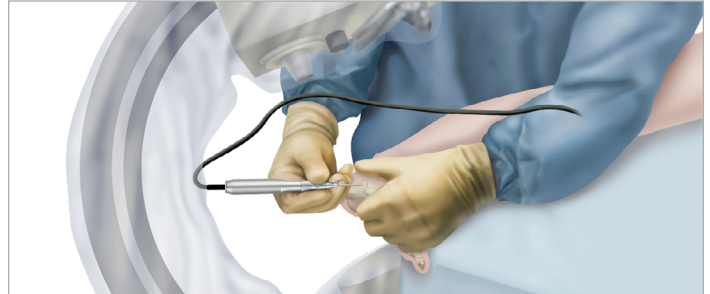


Figure 5

Mark the desired osteotomy plane on the lateral heel under X-ray guidance. **(Figure 6)**



The osteotomy path should be well away from the posterior facet of the subtalar joint to avoid damage to the joint line.



Figure 6

Operative technique

Transverse osteotomy (575901PK)

1. Incision

Make a 1cm incision over the previously marked center of the path of the desired osteotomy. Subperiosteally dissect superiorly and inferiorly along the line with an elevator. **(Figure 7)**



WARNING

The course of the sural nerve must be respected here to avoid nerve injury.

2. Guide placement

After attaching the handle to the cut guide, introduce the guide on top of the skin, aligning the opening of the guide with the mark on the skin. **(Figure 8)**

Confirm the orientation and trajectory of osteotomy by aligning the dot centrally in the ring of the bullseye under fluoroscopy. **(Figure 9)**

Alternate guide placement can be achieved by first introducing the 3×20mm burr through the skin portal 90 degrees to the long axis of the calcaneus. Confirm under fluoroscopy that the burr is perpendicular to the calcaneus in the axial view. Leaving the burr inserted, remove the handpiece and slide the guide over the burr. Continue with alignment and fixation.

Once the guide is placed appropriately, fixate the guide with two 1.6mm K-wires bi-cortically in the angled holes. These holes should be anterior to the cut line. Place two additional 1.6mm K-wires bi-cortically in the posterior aspect of the oblong holes to allow mobilization of the posterior calcaneal fragment after the osteotomy is complete. **(Figure 10)**



CAUTION

If orthograde orientation is not achieved, defective osteotomies and injury to anatomically relevant structures are a possible consequence.

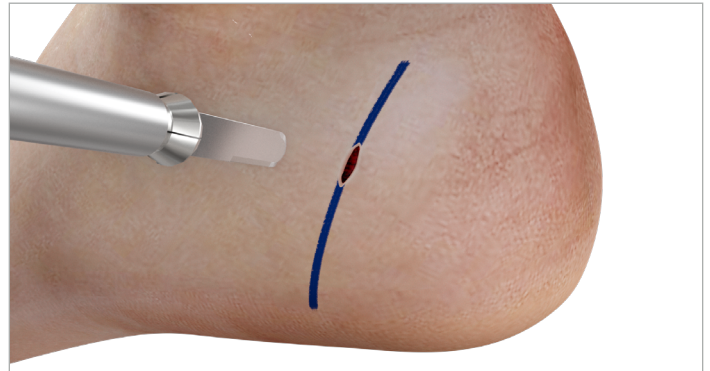


Figure 7

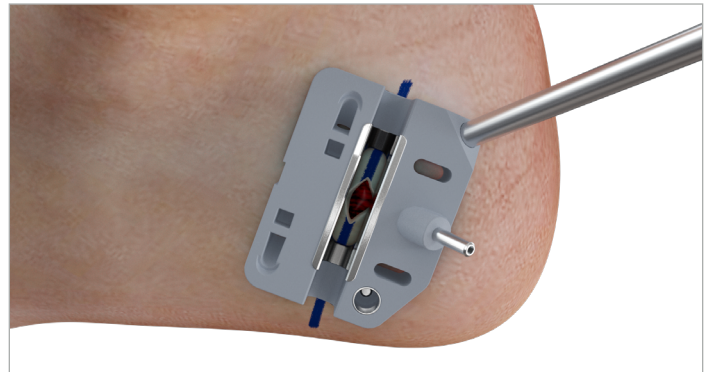


Figure 8

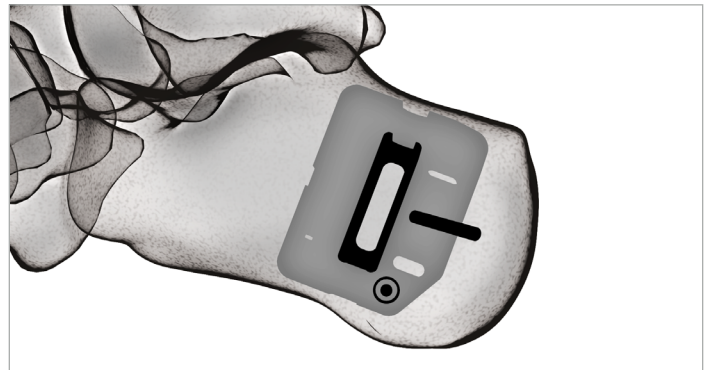


Figure 9

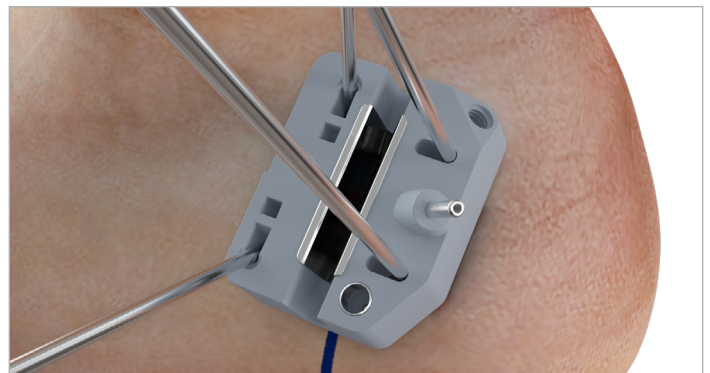


Figure 10

Operative technique

Bend the K-wires to hold the osteotomy guide in place. **(Figure 11)** Attach the irrigation tube to the osteotomy guide irrigation port. Remove the handle from the osteotomy guide and insert the burr into the handpiece.

3. Osteotomy

Ensure that the full length of the burr's cutting surface is inserted into the bone to minimize the possibility of cutting soft tissue during the procedure. Burr the calcaneus in quadrants. **(Figures 12-15)**

CAUTION

To prevent damage to the burr and guide, do not power the burr until the cutting flutes are fully seated in bone.

Burr the lateral and then the far (medial) cortex. The guide is designed to maintain the selected osteotomy plane while burring. Ensure the burr follows a pivoting motion by keeping the burr's point of contact with the guide static rather than sweeping the burr across the osteotomy slot. The surgeon's non-dominant hand can be placed on the medial cortex of the calcaneus to palpate and confirm safe burr placement.

NOTICE

The burr is not long enough to cut both cortices of the calcaneus in one sweep, and this should not be attempted.

The calcaneal fragment becomes mobile once the osteotomy is completed; this can be confirmed by motion of the K-wires within the K-wire slot.

(Figures 16-17)

Remove the K-wires from the osteotomy guide and remove the guide. The straight periosteal elevator (57S1MI07) is introduced through the portal to lever the osteotomy and assist with desired displacement and control of the osteotomy. Screw fixation can be undertaken as per surgeon preference.

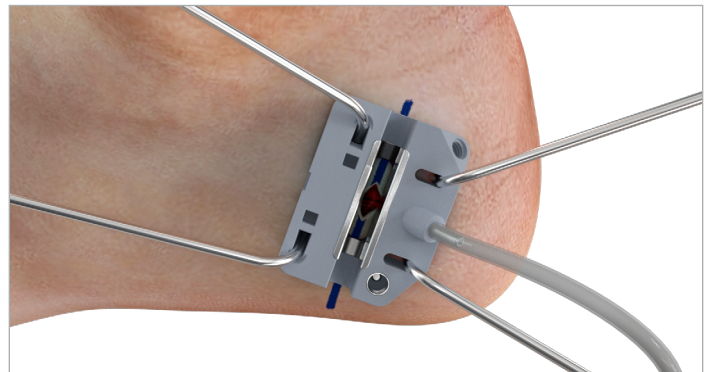


Figure 11

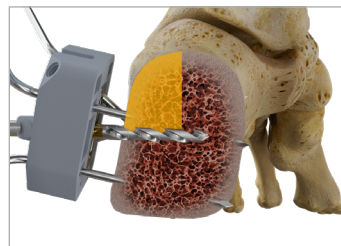


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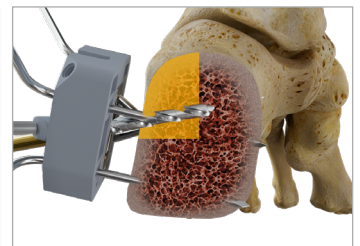


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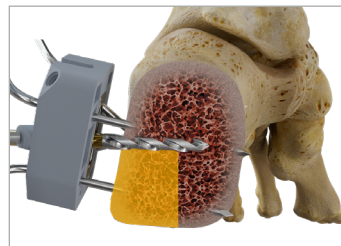


Figure 14

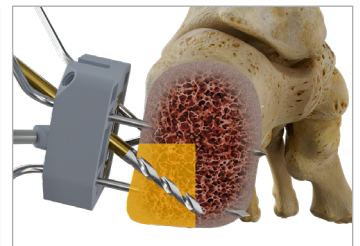


Figure 15

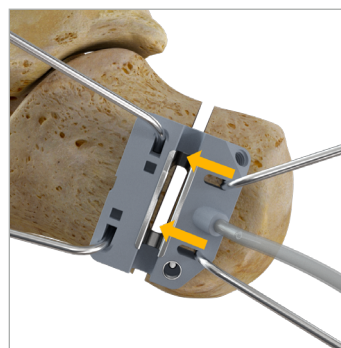


Figure 16

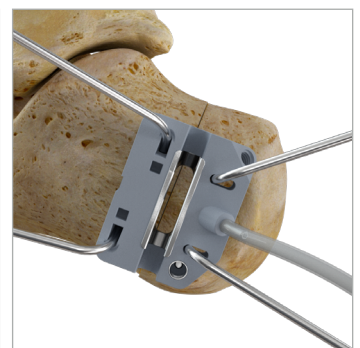


Figure 17

Operative technique

Zadek osteotomy (57S904PK)

1. Incision

After the osteotomy plane is marked, the portal is then positioned at the apex of the desired osteotomy which should be approximately 7.5mm above the plantar cortex. Make a 1cm incision at the apex, bisecting the anterior and posterior arms of the intended osteotomy. **(Figure 18)**



WARNING

The course of the sural nerve must be respected here to avoid nerve injury.

2. Guide placement

After attaching the handle to the cut guide, introduce the guide on top of the skin portal. The antennas will display the trajectory of the anterior and posterior arms of the osteotomy. **(Figure 19)**

Confirm the orientation and trajectory of osteotomy by aligning the dot centrally in the ring of the bullseye under fluoroscopy. **(Figure 20)**

Alternate guide placement can be achieved by first introducing the 3 × 20mm burr through the skin portal 90 degrees to the long axis of the calcaneus. Confirm under fluoroscopy that the burr is perpendicular to the calcaneus in the axial view. Leaving the burr inserted, remove the handpiece and slide the guide over the burr. Continue with alignment and fixation.

Once the guide is placed appropriately, fixate the guide with two 1.6mm K-wires bi-cortically in the circular holes. Place two additional 1.6mm K-wires bi-cortically in the angled holes. Bend the K-wires to hold the osteotomy guide in place. **(Figure 21)**

Attach the irrigation tube to the osteotomy guide irrigation port. Remove the handle from the osteotomy guide and insert the burr into the handpiece.



CAUTION

If orthograde orientation is not achieved, defective osteotomies and injury to anatomically relevant structures are a possible consequence.



Figure 18

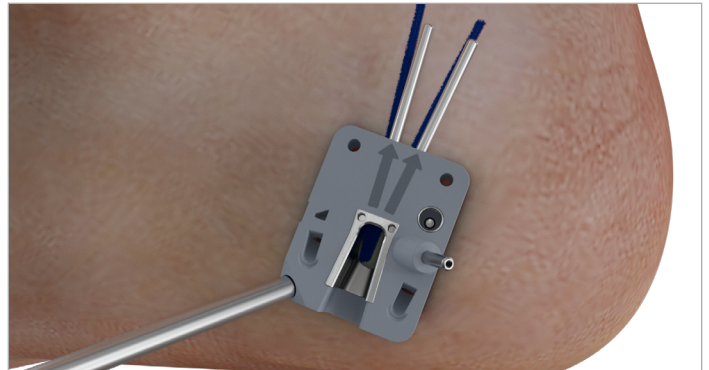


Figure 19



Figure 20

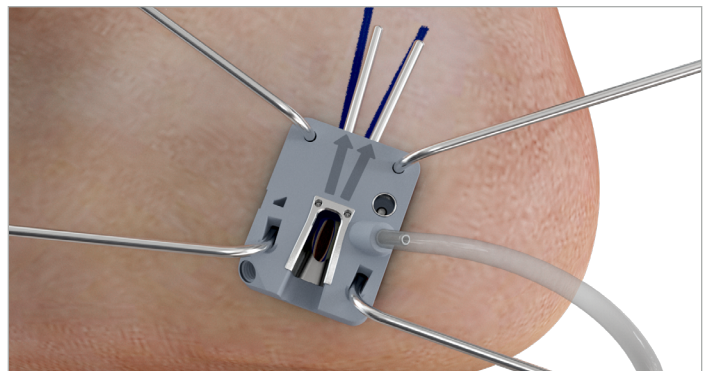


Figure 21

Operative technique

3. Osteotomy

Ensure that the full length of the burr's cutting surface is inserted into the bone to minimize the possibility of cutting soft tissue during the procedure. Burr the posterior arm of the osteotomy, first starting at the near cortex and then the far (medial) cortex. **(Figure 22)**

CAUTION

To prevent damage to the burr and guide, do not power the burr until the cutting flutes are fully seated in bone.

The guide is designed to maintain the selected osteotomy plane while burring. Repeat this process for the anterior arm of the osteotomy. Burr the near cortex first and then the far (medial) cortex. Alternately, after burring the first arm of the zidek, a 3.1mm Wedge burr can be used to morselize the wedge.

NOTICE

The burr is not long enough to cut both cortices of the calcaneus in one sweep, and this should not be attempted.

Confirm the osteotomy is complete. Remove the K-wires from the osteotomy guide and remove the guide. Close the osteotomy to achieve desired correction. Screw fixation can be undertaken as per surgeon preference.

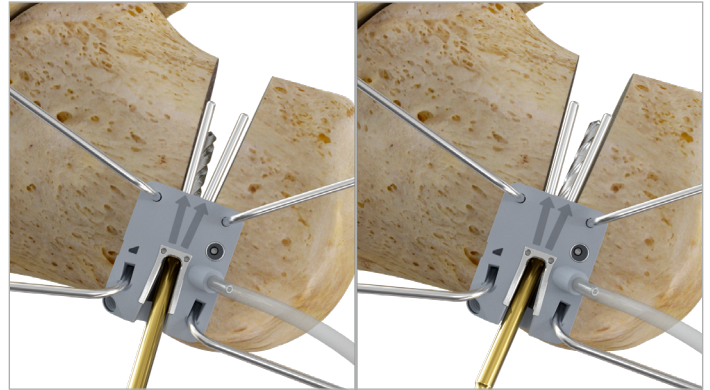


Figure 22

Calcaneal Translator

1. Insertion

An optional Calcaneal translator (57S906PK) is provided to translate the fragment. Ensure that the soft tissues surrounding the osteotomy are properly loosened to allow for insertion of the guide and translation of the calcaneus. Separate the two halves of the translator. From a lateral approach, insert the hook into the anterior section of the calcaneus until the hook is firmly set into bone. **(Figure 23)**

The translator can also be used in a medial approach for a lateral shift.



WARNING

The Peroneal tendon and neurovascular structures surrounding the tarsal tunnel must be respected during placement and translation.

2. Pinning

Connect the anterior section of the translator to the T-slot of the posterior section. **(Figure 24)**

Twist the anterior set screw clockwise until the pusher is flush to skin and then place 2 1.6 k-wires into the anterior most holes of the posterior pusher. **(Figure 25)**

3. Translation

Twist the posterior set screw clockwise to achieve desired translation of the calcaneal fragment. **(Figure 26)** Screw fixation can be undertaken as per surgeon preference.

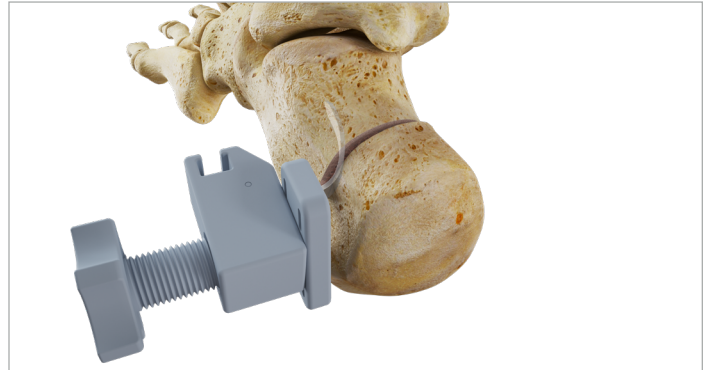


Figure 23



Figure 24

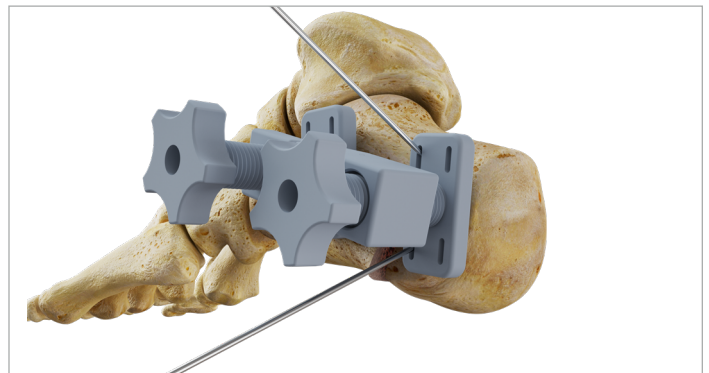


Figure 25



Figure 26

System components

Part number	Description
575901PK	PROstep MIS Transverse Guide
575904PK	PROstep MIS Zadek Guide
57SC320L	MICA Cutting Burr 3×20mm long
57S905PK	PROstep Calcaneal Instruments Pack
58RW3113	Cortical Wedge Burr 3.1×13
57S906PK	Calcaneal Translator
57S0MI06	MIS Sterile Instrument Pack - Curved elevator - Straight elevator - Double-ended rasp - Blade

The information in the section is not intended to be used for sales and/or promotional purposes. This information is solely intended to be used as a reference for clinical usage.

Notes

Foot & Ankle

This document is intended solely for the use of healthcare professionals. A surgeon must always rely on his or her own professional clinical judgment when deciding whether to use a particular product when treating a particular patient. Stryker does not dispense medical advice and recommends that surgeons be trained in the use of any particular product before using it in surgery.

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