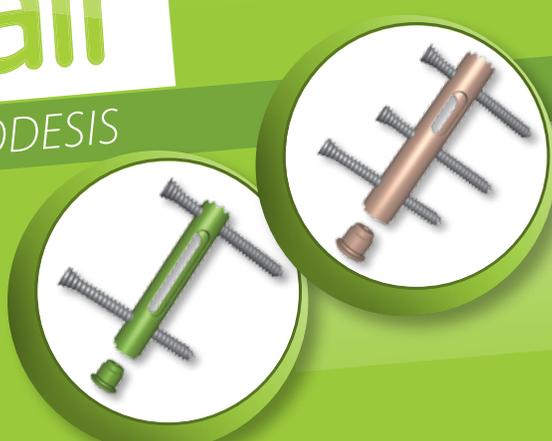


SURGICAL
TECHNIQUE

CALCANAIL

FRACTURE - SUBTALAR ARTHRODESIS



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CALCAnail

- FRACTURE -

CALCAnail technique:

- Minimally invasive percutaneous approach at the posterior calcaneal tuberosity avoids complications associated with standard lateral ORIF approach
- Locking nail holds posterior facet articular surface in the proper position after intrafocal reduction
- Option to convert easily from internal fixation procedure to subtalar fusion



SURGICAL

- FOR FRACTURES -



Anatomopathology of posterior facet fractures of the calcaneus

Calcaneal fractures can be easily understood and analysed on the preoperative CT-scan once the position of the Palmer's fundamental fracture line has been located.

When the shear line is medial, a large lateral articular fragment will tilt and pivot, pushing into the calcaneal body behind the angle of Gissane or «crucial angle», just behind the sinus tarsi. This is a vertical fracture (**Fig.1a**).

When the shear line is lateral, there is a large medial fragment that may or may not push down: most often the posterior calcaneal tuberosity and the rest of the calcaneus are moved up and displaced in a varus, flexed position. This is a horizontal fracture (**Fig.1b**). When the shear line is located in the middle of the dorsal side of the talar articular surface, the lateral fragment tilts and the medial fragment pushes down to create a double contour. This is a mixed fracture (**Fig.1c**). The posterior ending of the fracture line must also be analyzed: if the retrothalmic line is located on the upper cortex of the fractured calcaneum, it is a tongue-type fracture (**Fig.1d**); if the line goes toward the posterior facet of the posterior calcaneal tuberosity, it is a joint depression-type fracture (**Fig.1e**).



Fig.1a
vertical
fracture



Fig.1b
horizontal
fracture



Fig.1c
mixed
fracture

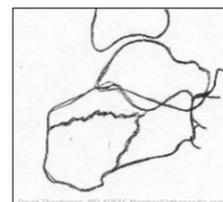


Fig.1d
Tongue-Type
fracture

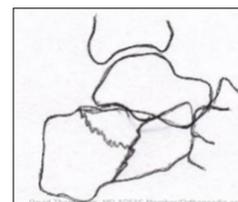
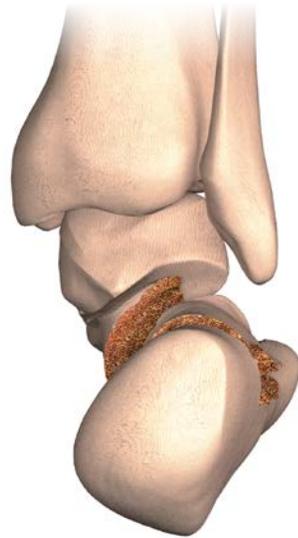


Fig.1e
Depression-Type
fracture

Preoperative planning

Preoperative CT scans for articular fractures of the calcaneus have become routine. A minimum of 250 thin, contiguous slices of the calcaneus must be made in order to obtain volume rendering reconstructions. Simple sagittal and horizontal reconstructions are not, in fact, sufficient for a quality analysis. Radiology station software or the software Osirix for Mac make it possible to create the reconstructions on one's own. The bones surrounding the calcaneus must be removed step-by-step by rotating the calcaneus on its axis. This may take 5 to 15 minutes depending on practice. At the end of the procedure, the superior, lateral, medial, and anterior views will make it possible to closely analyse the type of fracture, the exact position of the separation line, and the size of the depressed fragment(s).



Surgical indications

Vertical and mixed fractures are incongruent, so surgical indications are logical. Fractures with a horizontal depression should be operated if the loss of height assessed with the Böhler angle is significant, or roughly $<10^\circ$.

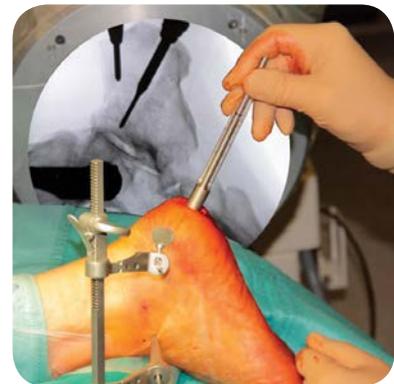
Horizontal and vertical fractures, which affect the whole joint unit, are easy to reduce. Whether the line is medial (vertical fractures) or lateral (horizontal fractures), a large, intact articular fragment only needs to be repositioned under the talus.

Mixed fractures are more difficult to treat. First the medial fragment must be reduced to correct the overlap on the medial cortex which is very visible on the CT scan, then the lateral fragment is reduced without a step between these two fragments.

Patient positioning

Two positions are possible:

- The patient is usually placed on his/her side with the flexed limb resting on a pad and the foot off the table. Lateral and retrotibial fluoroscopy views are taken by externally rotating the foot and tipping the C-arm along the table axis.
- Alternatively, the patient can be placed prone with the knee flexed so the leg is placed at 45° relative to the table, particularly if it is a bilateral fracture.



➔ Step 1: Placement of K-wire in posterior tuberosity



At the junction between the posterior and plantar aspect of the heel, use a scalpel to perform a posterior incision down to the bone. The incision starts from the lowest part of the posterior calcaneal tuberosity and goes up in a posterior direction for 20 mm.

The $\Phi 10$ mm K-wire with stopper (Ref. 265 570) is inserted under power; it must be placed in the correct position as this determines the orientation of the work chamber and later on, the nail position.

- On the lateral view, the K-wire must be aligned with the posterior calcaneal bone trabeculae, about 45° top to bottom and back to front. Its proximal end must be placed under the displaced talar fragments and above the angle of Gissane (Fig.2a).
- On the retrotibial view, the K-wire is typically aligned with the middle of the calcaneal tuberosity axis; this roughly corresponds to the axis of the 4th interdigital space. Depending on the location of the primary fracture line the K-wire should be placed into the larger fragment (eg. Sanders II-B fracture).

At this point, the varus displacement of the posterior tuberosity can be ignored as it will be automatically corrected when the distractor is positioned in place (Fig.2b).

Fig.2a
Lateral view

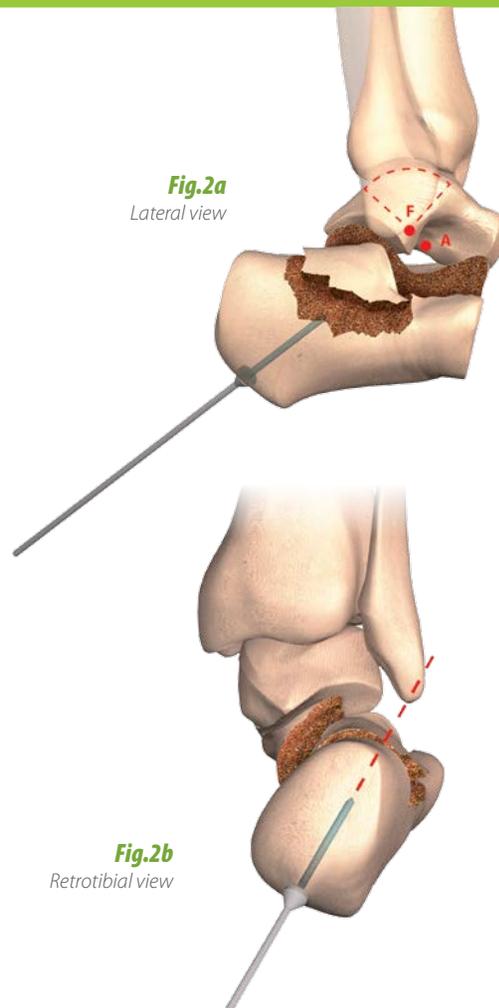
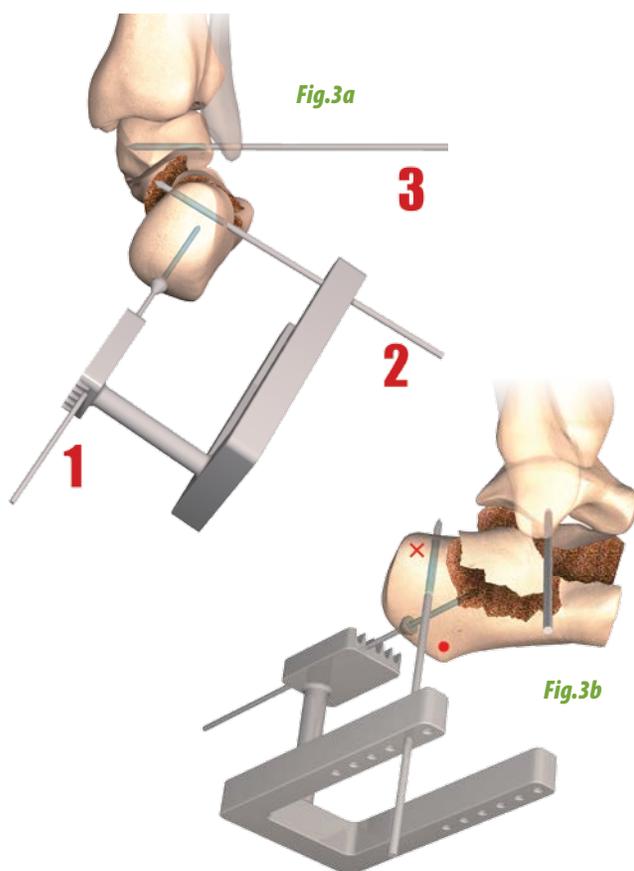


Fig.2b
Retrotibial view



➔ Step 2: Placement of subtalar distractor

The second surgical step consists of placing a Caspar-type subtalar distractor on two K-wires, one in the talus and one in the posterior calcaneal tuberosity. This distractor (Ref. 265 599) is used to correct the varus deformity of the posterior tuberosity and to distract the subtalar joint so the depressed articular surface can be reduced. Two $\Phi 3.2$ mm K-wires (Ref. 265 668) will be placed across the foot axis. They cross the talus and the calcaneum, must be palpable under the medial aspect of the foot, and must not breach the skin.

- For a depression fracture, place the calcaneal K-wire in the posterosuperior part of the posterior tuberosity at least 10 mm above the future tunneling point in the tuberosity (✗ denotes the position).
- For a tongue-type fracture place the K-wire in the inferior part of the posterior tuberosity 10 mm below the future tunnel (• denotes the position). A positioning square is available (Ref. 266 147) to position this K-wire perpendicular to the previously positioned K-wire with stopper (Fig. 3a).
- Place the talar K-wire perpendicular to the lateral aspect of the talus, in the lateral tubercle at the center of the talar dome, making sure not to injure the lateral peroneal tendons (Fig. 3b).
- Position the Caspar distractor onto the K-wires in a non-distracted position and tighten the thumb screws to the K-wires (Fig. 4).

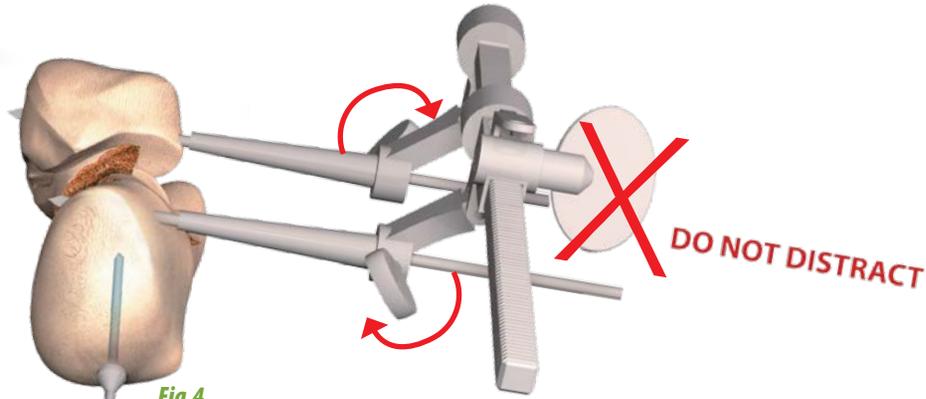


Fig.4

→ Step 3:
Preparation of work chamber

The third step consists of introducing the $\Phi 10$ mm hollow reamer (Ref. 265 572) over the K-wire with stopper (Fig. 5). Make sure the K-wire does not poke out of the reamer windows. Aim the hollow reamer below the depressed articular fragments, without making them more fragile, and above the critical angle (Angle of Gissane). Under fluoroscopy ensure the hollow reamer does not deviate from the axis of the K-wire. If deviation occurs, withdraw the hollow reamer and reinsert ensuring axial alignment with the K-wire is maintained. Remove the hollow reamer and the K-wire with stopper; a 2-3 cm bone plug can then be removed and may be used at the end of the procedure to fill the hollow nail and/or graft the subtalar joint in an arthrodesis. (Fig. 6).

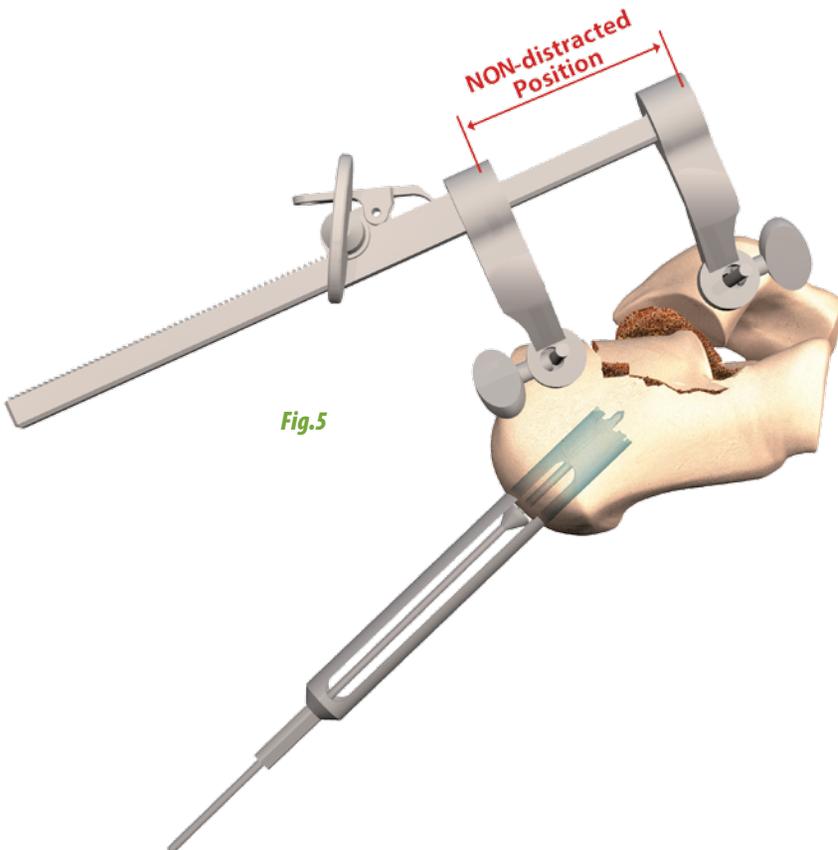


Fig.5

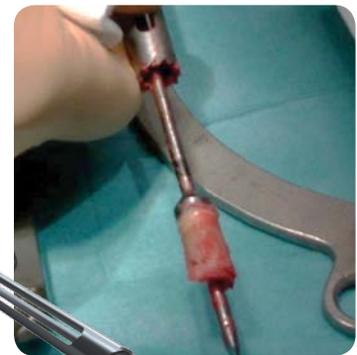


Fig.6

SURGICAL TIPS AND TRICKS

To remove the bone plug, grip it with a Kelly or Kocher clamp and slowly remove the K-wire with stopper using a motor drive.

➔ Step 4:

Fracture reduction

To correct the posterior tuberosity varus and loss of calcaneal height, turn the large thumbscrew on the distractor several turns to gradually distract the subtalar joint..

The distractor can be used with some force, even if it causes minor damage to the skin, near the K-wires, which can be sutured when the incision is closed (Fig. 6a).

Use the curved tamp (Ref. 265 575), straight tamp (Ref. 265 576), spatula (Ref. 265 586), and light mallet taps to free up the fragments and push them towards the talus into the empty space created by the distractor. Begin by pushing the medial fragment to correct the overlap of the medial cortex (Fig. 6b and 6c), then reduce the lateral fragment by changing the orientation of the curved tamp (Fig. 6d and 6e). Use lateral fluoroscopy views to track the reduction until the subtalar joint line is congruent and the critical angle of Gissane and Bohler's angle are restored (Fig. 7). At the end of the procedure, verify the reduction on the retrotibial view.

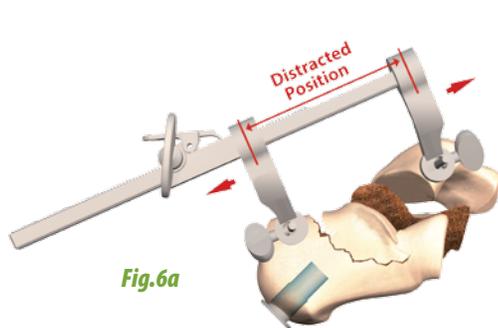


Fig.6a

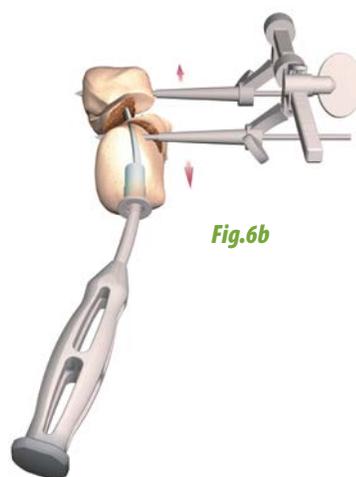


Fig.6b

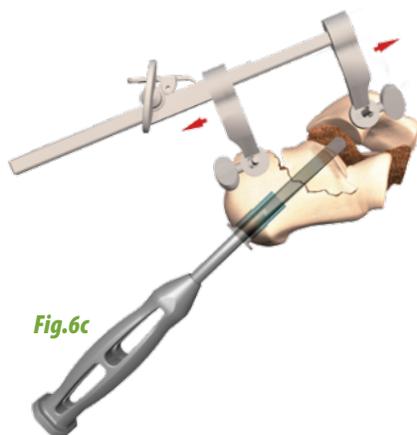


Fig.6c

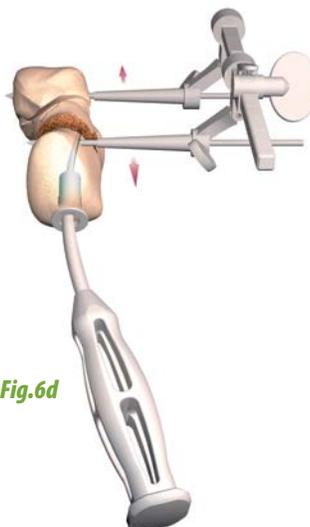


Fig.6d

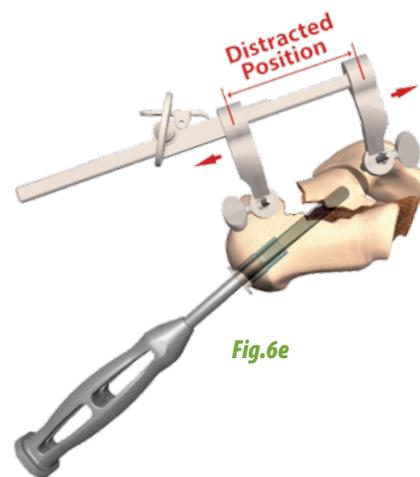


Fig.6e



Fig.7

Step 5: Nail introduction

The length of nail required is determined using the nail guide (Ref. 266 291) and nail length gauge (Ref. 266 340).

The nail length gauge must be inserted until the tip is against the cortex of the posterior facet (Fig. 8a).

The nail is available in three lengths: 45, 50 and 55 mm (see reference table 1). Place the selected nail onto the nail holder with the ball end of the T-handle on the same side as the D-shaped holes on the medial side of the nail. Use the handle-nail connector screw (Ø10 mm) to secure the nail holder to the nail.

- Handle-nail connector screw Ø10 mm: Ref. 265 568
- Nail holder Ø10 mm: Ref. 265 579

If desired, insert the harvested cancellous bone plug into the nail and position it to cover the nail windows (Fig. 8b). Alternatively, all or part of the bone plug can be used to graft the underside of the articular surface before the nail is introduced. Introduce the nail into the work chamber using small rotating motions, and then bring it up to the underside of the previously raised articular fragments (Fig. 8c). Make sure the teeth on the nail make contact with the cancellous bone in the articular fragments to support them.

The nail holder is positioned so that the ball end of the T-handle is on the medial side. To ensure the proximal end of the nail is fully engaged in the bone, loosen the handle nail connector (Ref. 265 568) one full turn and pull back on the T-handle to create separation with the nail. Now the proximal end of the nail is visible under fluoroscopy.

Once the nail is in place, put the Ø10 mm fracture nail alignment frame (Ref. 265 577) onto the lateral arm of the nail holder and secure in place using the nail holder connecting screw (Ref. 265 581) (Fig. 9a). After placement of the drill guide for K-wires (Ref. 266 148), through the holes of the nail alignment frame corresponding to the nail length selected, under power the K-wires for cannulated screws Ø1.6 x 200 mm (Ref. 266 158) are introduced until bicortical (Fig. 9b and 9c).

SURGICAL TIPS AND TRICKS: POSITIONING THE K-WIRES FOR SCREWS

Take care, the K-wires can accidentally go through the skin and cause the measuring to be wrong.

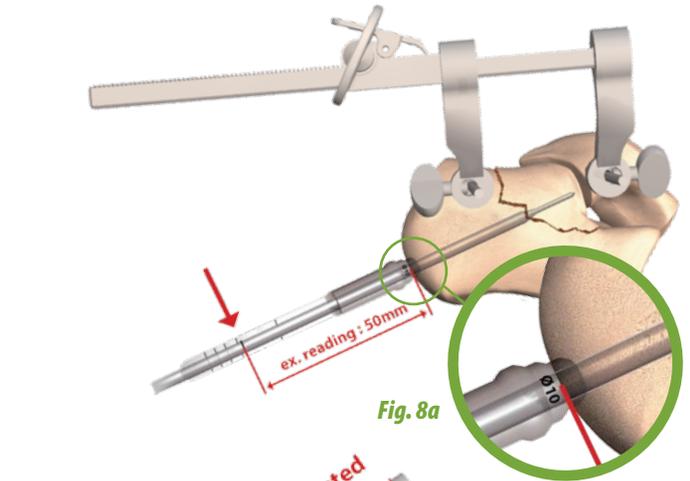


Fig. 8a

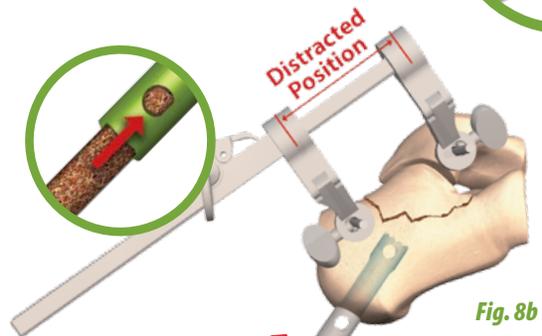


Fig. 8b

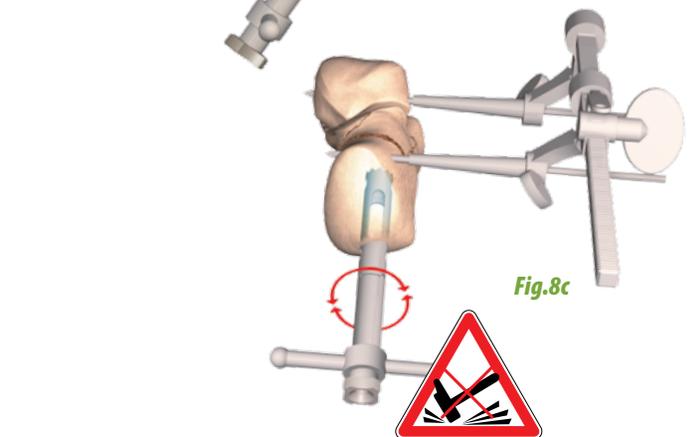


Fig. 8c

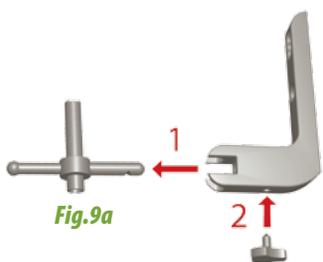


Fig. 9a

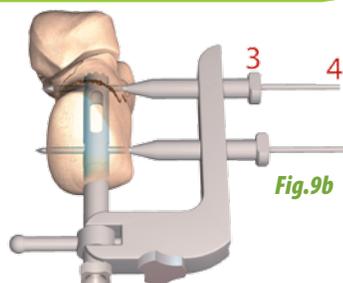


Fig. 9b

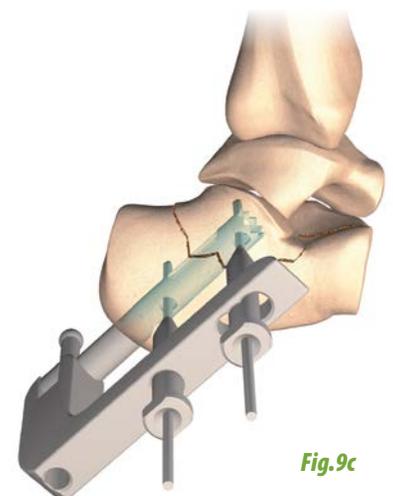


Fig. 9c

Remove the drill guide and use the cannulated screw length gauge (Ref. 266 146) to measure the required screw length. Typically, 30 mm to 32 mm screws are used (see reference table 2). The K-wires can be further inserted to puncture through the medial skin so they can be retained with hemostats. Use the Φ 3.7 mm cannulated drill bit (Ref. 265 587) over the Φ 1.6 mm K-wires (Fig.10a). The screws are placed using a cannulated screwdriver (Ref. 254 599) and tightened enough to compress the fragments and transversely reduce the calcaneus

(Fig. 10b and 10c).

On the axial view, check that the screws are well inserted, and not too long. Furthermore, if the interfragmentary gap needs to be reduced at the separation line, the screw can be tightened until the screw head makes contact with the lateral wall of the nail, which will provide excellent interfragmentary compression.

Once the locking step is completed, the distractor can be withdrawn.

SURGICAL TIPS AND TRICKS: JOINT DEPRESSION-TYPE FRACTURES

Tongue-type fractures or depression fractures are sometimes difficult to reduce. It may be helpful to insert a Steinmann pin in the fragment and reduce the displacement using a levering motion as one would for closed lifting-nailing. It may also be useful to open up access to the fragment at the Angle of Gissane using a sinus tarsi incision. Lastly, it is possible to perfect the closure of the posterior facet by introducing an oblique screw through the fibers of the Achilles tendon and putting it through the slots of the nail and the plantar cortex.

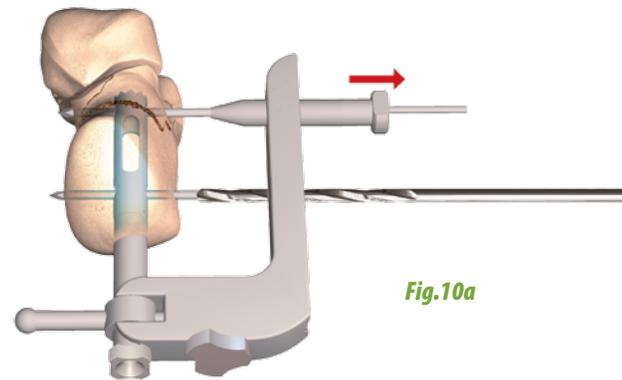


Fig.10a

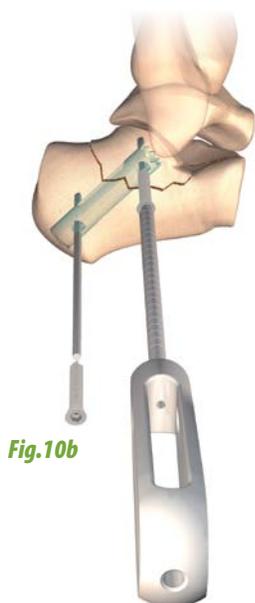
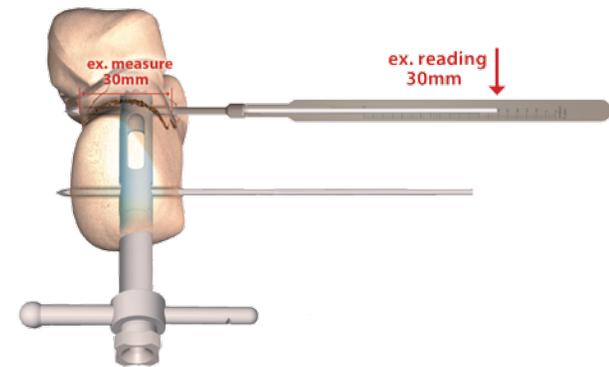


Fig.10b

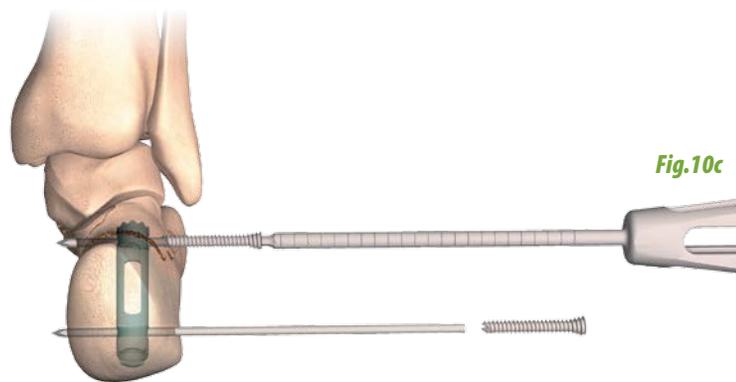


Fig.10c



Fig.10d

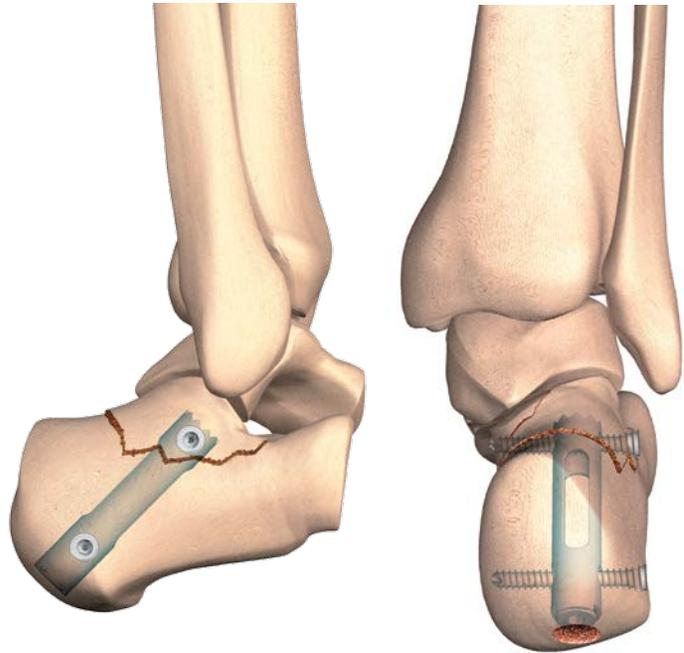
Depending on the distance between the end of the nail and posterior tuberosity cortex, a cap can be placed on the nail to make it easier to remove later on. The cap is positioned with the cannulated screwdriver. Engagement can be facilitated by insertion of a Φ 1.6 mm K-wire into the nail (Fig. 10d).



>>>>> Final appearance

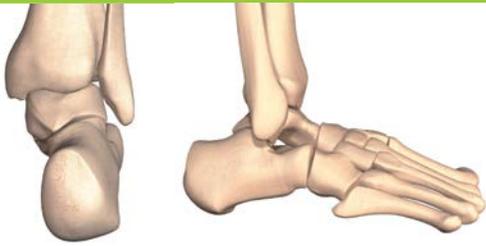
1	Reference	Fracture Nail Φ 10 mm
	268 311	CALCANail® Nail Φ 10 L 45 + Cap
	268 312	CALCANail® Nail Φ 10 L 50 + Cap
	268 313	CALCANail® Nail Φ 10 L 55 + Cap

2	Reference	Screw
	268 317	Cannulated screw Φ 5 L 24 mm
	268 318	Cannulated screw Φ 5 L 26 mm
	268 319	Cannulated screw Φ 5 L 28 mm
	268 320	Cannulated screw Φ 5 L 30 mm
	268 321	Cannulated screw Φ 5 L 32 mm
	268 322	Cannulated screw Φ 5 L 34 mm
	268 323	Cannulated screw Φ 5 L 36 mm
	268 324	Cannulated screw Φ 5 L 38 mm
	268 325	Cannulated screw Φ 5 L 40 mm



Post-operative care

The patient may begin ambulating immediately following surgery using crutches and non-weight bearing. A pain relieving foot brace is recommended and good wound healing must be observed. Treatment continues for the first 15 days. Afterwards, the patient may then begin walking using two crutches and a heel rest for the following three weeks. After the fifth week, the patient can walk in normal shoes and subtalar physical therapy is started.



CALCAnail

- SUBTALAR ARTHRODESIS -

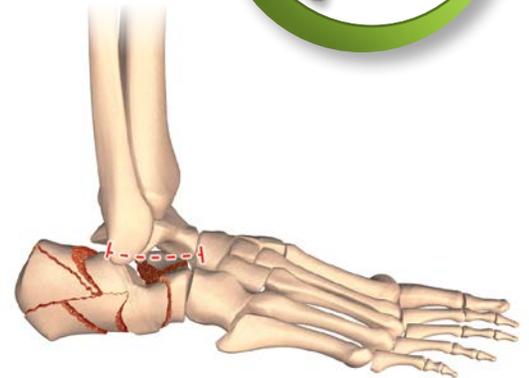
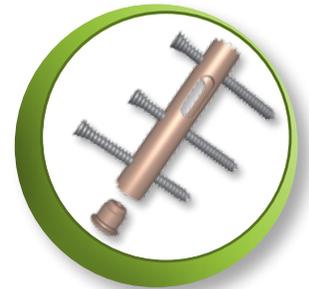
The arthrodesis version of the CALCAnail is used in the following scenarios:

- Recent comminuted fractures where internal fixation is impossible or destined to fail because of the seriousness of the cartilage injuries (mixed fractures with 2 or more fracture lines; comminuted fractures)
- Calcaneal fracture sequelae in cases with post-traumatic osteoarthritis and/or poor functional results
- Degeneration of the posterior subtalar joint or valgus flatfoot deformities.



SURGICAL TECHNIQUE

- FOR SUBTALAR
ARTHRODESIS -



Patient positioning

Two positions are possible: lateral and prone.

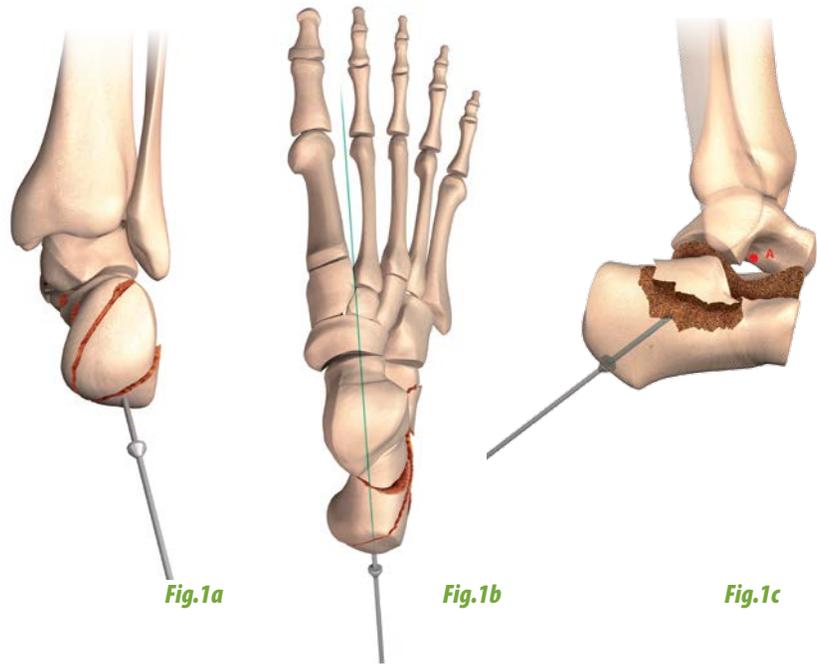
- The patient is usually placed on his/her side with the flexed limb resting on a pad and the foot off the table. Lateral and retrotibial fluoroscopy views are taken by externally rotating the foot and tipping the C-arm along the table axis.
- Alternatively, the patient can be placed prone with the knee flexed so the leg is placed at 45° relative to the table, particularly if it is a bilateral fracture.

➔ Step 1: Placement of K-wire in posterior tuberosity

At the junction between the posterior and plantar aspect of the heel, use a scalpel to perform a posterior incision down to the bone. The incision starts from the lowest part of the posterior calcaneal tuberosity and goes up in a posterior direction for 20 mm.

The $\Phi 12$ K-wire with stopper (Ref. 265 571) must be placed in the correct position as this determines the orientation of the work chamber and later on, the nail position (Fig. 1a, 1b and 1c).

- On the lateral view, the K-wire should be positioned in the direction of the talar dome and above the angle of Gissane. The K-wire should not be too vertical and should pass through the sinus tarsi to avoid future conflict between the fibula and CALCANail talar screw.
- On the retrotibial view, K-wire placement must take into account the subtalar angle; this roughly corresponds to the axis of the first interdigital space. Depending on the location of the primary fracture line the K-wire may be positioned more

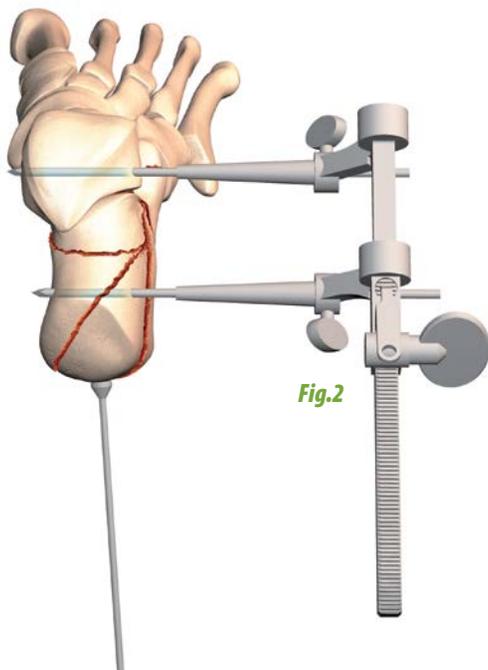


➔ Step 2: Placement of subtalar distractor

The second surgical step consists of placing a Caspar-type subtalar distractor (Ref. 265 599) onto two K-wires, one in the talus and one in the posterior calcaneal tuberosity. If needed, these $\Phi 3.2$ mm K-wires (Ref. 265 668) are used with the distractor to correct the varus deformity of the posterior tuberosity and distract the subtalar joint so the depressed articular surface can be reduced. Conversely, they can be used with the compressor (Ref. 266 353) to remove the joint space and bring the freshened talar and calcaneal articular surfaces together.

Two $\Phi 3.2$ mm K-wires (Ref. 265 668) will be placed across the foot axis.

- Place the calcaneal K-wire in the posterosuperior part of the posterior tuberosity at least 10 mm above for a depression fracture or below for a tongue fracture of the future tunneling point in the tuberosity. A positioning square is available (Ref. 266 147) to position this wire perpendicular to the previously positioned K-wire with stopper.
- Place the talar K-wire perpendicular to the lateral aspect of the talus, in the lateral tubercle at the center of the talar dome, making sure not to injure the lateral peroneal tendons.
- Palpate the medial aspect of the foot to locate the K-wires crossing the talus and calcaneus and make sure they do not perforate the skin. Position the distractor or compressor onto the K-wires and tighten the thumb screws (Fig. 2).



➔ Step 3: Preparation of work chamber

If a varus deformity is to be corrected then first insert the $\Phi 12$ mm K-wire with stopper so that it is only engaged in the calcaneus. To accomplish this either select the short $\Phi 12$ mm K-wire with stopper or if not available only insert the K-wire such that it does not cross the subtalar joint. This may leave the stopper short of being in contact with the calcaneal tuberosity. If there is no varus deformity to be corrected then select the length of $\Phi 12$ mm K-wire with stopper so that the talus is also engaged. The third step consists of introducing the $\Phi 12$ mm hollow reamer (Ref. 265 573) over the first K-wire with stopper. Make sure the K-wire does not poke out of the reamer windows. Ream until the articular surface of the calcaneus is crossed; remove the reamer and bone plug. If necessary activate the distractor so that a varus deformity can be corrected and/or an intrafocal reduction completed. Reintroduce the $\Phi 12$ mm K-wire with stopper (Ref. 265 571) into the created calcaneal tunnel and into the talus. Reintroduce the $\Phi 12$ mm hollow reamer (Ref. 265 573) into the calcaneal tunnel and ream until 10 mm below the anterior talar cortex. It is not necessary to retrieve the talar bone plug if it is not retained within the hollow reamer as it will fit into the hollow nail.

This reaming must be performed in two steps, as too much heat would be created if it was performed in a single step (Fig. 3).

➔ Step 4: Freshening of articular surfaces

This surgical step is best performed under distraction and is very important as it will determine the success of the fusion. Depending on the patient's case and surgical indication, articular debridement can be performed either through the tunnel or more commonly and more easily, by a small sinus tarsi incision on the lateral aspect of the calcaneus below the tip of the lateral malleolus. Reflect the lateral peroneal tendons, and then under power use a burr and/or the $\Phi 10$ mm hollow reamer (Ref. 265 572) with K-wire (Ref. 265 570) to carefully remove the subtalar joint cartilage (Fig. 4).

➔ Step 5: Bone graft

Depending on the surgical indication, a bone graft may be necessary. It isn't always necessary for comminuted fractures. The bone plug removed at the beginning of the surgery may be sufficient. **Care must be taken to insert the nail before the distractor is released. The distractor should always be released before inserting the screws.**

For secondary arthrodesis after malunion or an orthopaedic indication, bone grafts are common practice. Compression may be useful after placing the bone graft. The distractor must be withdrawn and the compressor (Ref. 256 353) assembled on to the same talar and tuberosity K-wires (Fig. 5).

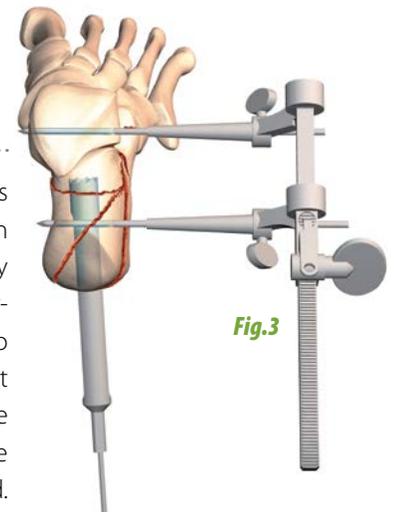


Fig.3

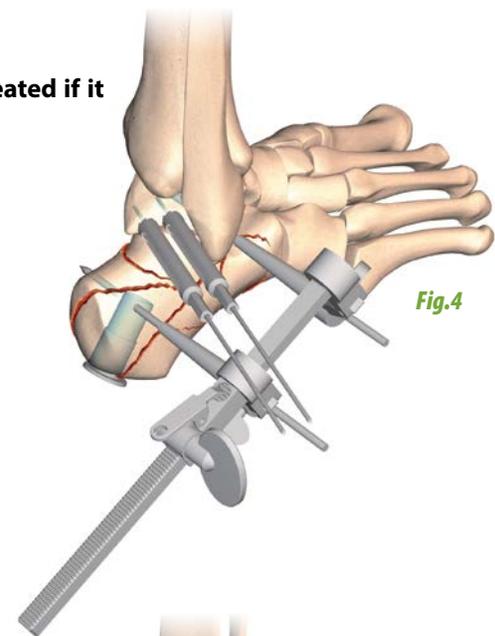


Fig.4

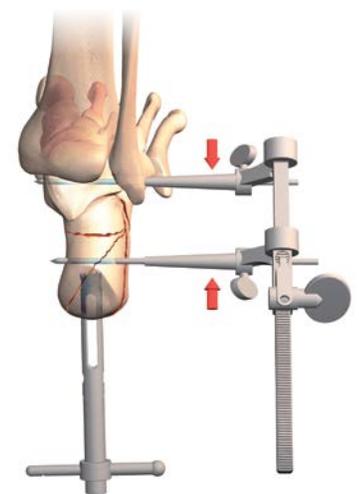


Fig.5

➔ Step 6: Nail placement

The length of nail required is determined after placing the nail guide (Ref. 266 291) and the nail length gauge (Ref. 266 340).

The nail length gauge must be pushed in until it is against the cortex (Fig. 6a).

The nail is available in three lengths: 65, 75, and 85 mm (see reference table 3). Place the selected nail on to the nail holder with the ball end of the T-handle on the same side as the D-shaped holes on the medial side of the nail. Use the handle-nail connector screw $\Phi 12$ mm to secure the nail holder to the nail.

• Handle-nail connector screw $\Phi 12$ mm: Ref. 265 569

• Nail holder $\Phi 12$ mm Ref. 265 580

At this stage, it is important to slide the spongy bone plug(s) that was/were removed with the hollow reamer inside the nail and to position it/them against the nail slots. This will help the arthrodesis to fuse together.

The nail is then introduced into the work chamber with small rotating motions, then pushed up until it reaches the talar body. Its proximal tip must be at least 10 mm from the anterior cortex of the talus. To ensure the proximal end of the nail is fully engaged in the bone, loosen the handle nail connector (Ref. 265 569) one full turn and pull back on the T-handle to create separation with the nail. Now the proximal end of the nail is visible on fluoroscopy.

Once the nail is in place, put the $\Phi 12$ arthrodesis nail alignment frame (Ref. 265 578) onto the lateral arm of the nail holder (Ref. 265 580), and secure the assembly using the alignment frame-nail holder connecting screw (Ref. 265 581). If the talar screw conflicts with fibula, then rotate the nail so that the screw holes are oblique in lateral view and the trajectory of the screw is a bit anterior to posterior.

After placement of the drill guide for K-wires (Ref. 266 148) in the holes of the nail alignment frame corresponding to the nail length selected, K-wires $\Phi 1.6 \times 200$ mm (Ref. 266 158) are introduced under power until the bicortical. Remove the drill guide and use the cannulated screw length gauge (Ref. 266 146) to measure the required screw length. Typically, 30 mm or 32 mm screws are used (see reference table 4). The K-wires can be further inserted to puncture through the medial skin so they can be retained with hemostats. Use the $\Phi 3.7$ mm cannulated drill bit (Ref. 265 557) over the $\Phi 1.6$ mm K-wires. A screw is placed in the talar body and one or two screws in the calcaneus using the cannulated screwdriver (Ref. 254 599) (Fig. 6b and 6c).

Depending on the distance between the end of the nail and posterior tuberosity cortex, a cap can be placed on the nail to make it easier to remove later on.

For secondary fusion indications (malunion with posterior tuberosity varus), a corticocancellous bone graft can be used. Once the graft is positioned between the talus and calcaneus (Fig. 7), the nail can be placed through the graft (Fig. 7).

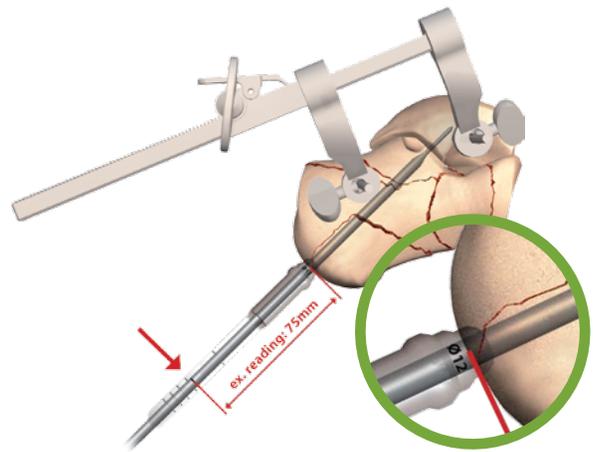


Fig.6a

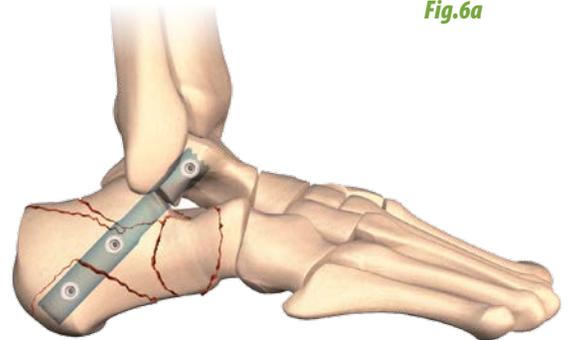


Fig.6b

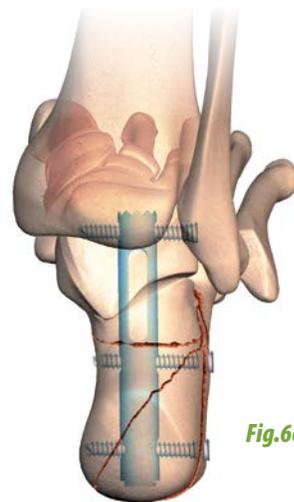


Fig.6c

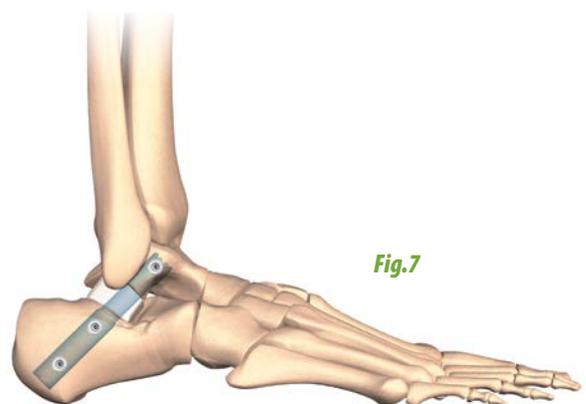
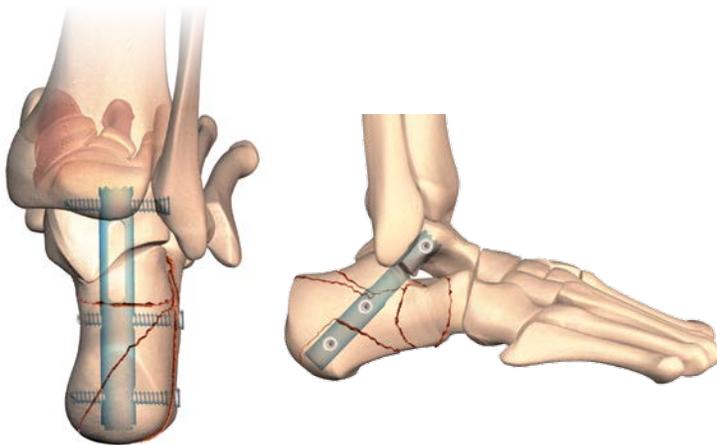


Fig.7



>>>>> *Final appearance*



Post-operative care

The patient may begin ambulating immediately following surgery using crutches and non-weight bearing. A pain relieving brace is recommended and good wound healing must be observed. Treatment continues for the first 15 days. Afterwards and after verifying that the wound is healing, a new cast is applied for one month. Physical therapy is usually not needed. After the sixth week, depending on the indication of the surgery, walking with progressive weight bearing using crutches may resume; a walking cast may also be used for added support. Physical therapy is usually not needed.

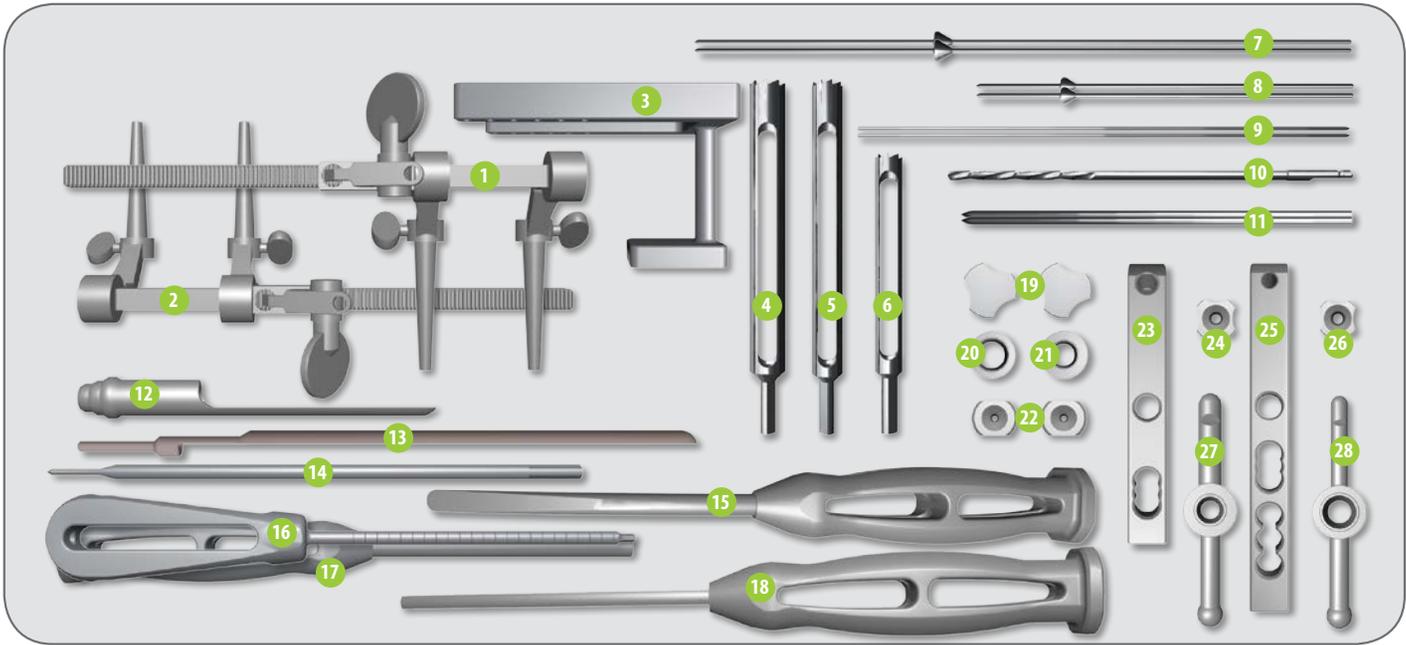
Implant Removal

Removal of the implant after a calcaneal fracture or subtalar arthrodesis is rarely indicated. If it proves to be necessary, removal of the screws can be done easily by locating the screw heads on the lateral side of the calcaneus and reinserting the $\Phi 1.6$ mm K-wires. The screwdriver guided by the K-wires will enable the screws to be extracted without difficulty. After making an incision over the posterior calcaneal tuberosity, the cap can be removed (if one was placed). The nail holder is repositioned after first cleaning the female screw threads. If the rotating motions of the nail holder are ineffective as a result of bone regrowth around the nail the larger-sized hollow reamer should be used round the nail: the $\Phi 12$ mm hollow reamer for the $\Phi 10$ mm fracture nail and the $\Phi 14$ mm hollow reamer for the $\Phi 12$ mm arthrodesis nail.

Removal will then be straight forward after reassembling the nail holder.

Reference	Arthrodesis Nail $\Phi 12$ mm
268 314	CALCANail® Nail $\Phi 12$ x 65 mm + Cap
268 315	CALCANail® Nail $\Phi 12$ x 75 mm + Cap
268 316	CALCANail® Nail $\Phi 12$ x 85 mm + Cap

Reference	Screw
268 317	Cannulated screw $\Phi 5$ x 24 mm
268 318	Cannulated screw $\Phi 5$ x 26 mm
268 319	Cannulated screw $\Phi 5$ x 28 mm
268 320	Cannulated screw $\Phi 5$ x 30 mm
268 321	Cannulated screw $\Phi 5$ x 32 mm
268 322	Cannulated screw $\Phi 5$ x 34 mm
268 323	Cannulated screw $\Phi 5$ x 36 mm
268 324	Cannulated screw $\Phi 5$ x 38 mm
268 325	Cannulated screw $\Phi 5$ x 40 mm



- 1. Compressor Ref. 266 353
- 2. Distractor Ref. 265 599
- 3. CALCANail Positioning square Ref. 266 147
- 4. Hollow reamer Φ 14 mm for arthrodesis nail removal Ref. 265 598
- 5. CALCANail Hollow reamer Φ 12 mm Ref. 265 573
- 6. CALCANail Hollow reamer Φ 10 mm Ref. 265 572
- 7. CALCANail K-wire with stopper Φ 12 mm (x2) Ref. 265 571
- 8. CALCANail K-wire with stopper Φ 10 mm (x2) Ref. 265 570
- 9. K-wire for cannulated screws Φ 1.6 x 200 mm (x4) Ref. 266 158
- 10. Drill bit Φ 3.7 for cannulated screws Ref. 265 587
- 11. K-wire for distractor Φ 3.2 x 150 mm (x4) Ref. 265 668
- 12. Nail length gauge Ref. 266 340
- 13. Cannulated screw length gauge Ref. 266 146
- 14. CALCANail Nail guide Ref. 266 291

- 15. Spatula Ref. 265 586
- 16. Cannulated Φ 3.5 mm hex screwdriver Ref. 254 599
- 17. Straight tamp Ref. 265 576
- 18. Curved tamp Ref. 265 575
- 19. Alignment frame-nail holder connecting screw (x2) Ref. 265 581
- 20. Bone tunnel plug Φ 12 mm Ref. 265 584
- 21. Bone tunnel plug Φ 10 mm Ref. 265 583
- 22. Drill guide for K-wire Φ 1.6 x 200 mm (x2) Ref. 266 148
- 23. Alignment frame for Fracture nail Φ 10 mm Ref. 265 577
- 24. CALCANail Handle-nail connector Φ 10 mm Ref. 265 568
- 25. Alignment frame for Arthrodesis nail Φ 12 mm Ref. 265 578
- 26. CALCANail Handle-nail connector Φ 12 mm Ref. 265 569
- 27. CALCANail Nail holder Φ 10 mm Ref. 265 579
- 28. CALCANail Nail holder Φ 12 mm Ref. 265 580

