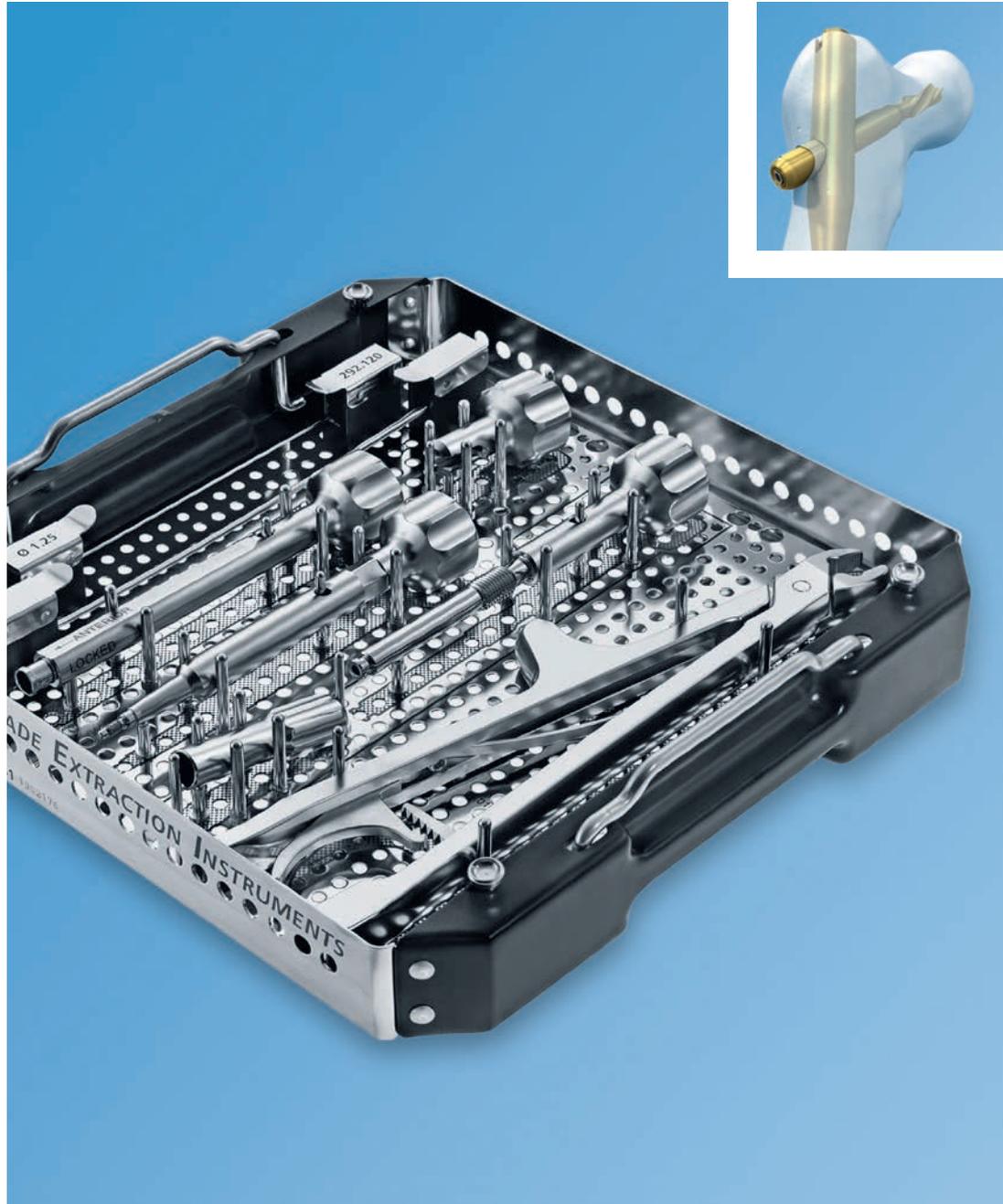


PFNA/PFNA-II. Blade Extraction Set.

Surgical Technique



This publication is not intended for distribution in the USA.

Instruments and implants approved by the AO Foundation.

 Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

Processing, Reprocessing, Care and Maintenance

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

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Removal of Implants

For many patients, implant removal often represents the true completion of fracture treatment. While giving due concern to the patient's own wishes, the expense, utility, and risks of removal of the implants must be weighed. The implications of leaving the implant in place should always be explained to the patient.

As a matter of principle, implants can be removed once the fracture has healed and the load capacity has been re-established.

In the case of implant removal, complications may arise for a variety of reasons and it is important that the surgeon should be prepared for this. In addition to extraction instruments such as screwdrivers, instruments to extract damaged and broken implants should also be readily available.

The Synthes PFNA/PFNA-II Blade Extraction Set is a special set containing instruments for the extraction of the PFNA/PFNA-II blade in certain situations where the instruments of the standard set are not sufficient.

Recommended literature

Rüedi T.P. et al (2007): Implant removal.

AO Principles of Fracture Management, Volume 1 – Principles: 729–731

Müller-Färber J (2003): Die Metallentfernung nach Osteosynthesen. In: Der Orthopäde, Book 11: 653–670

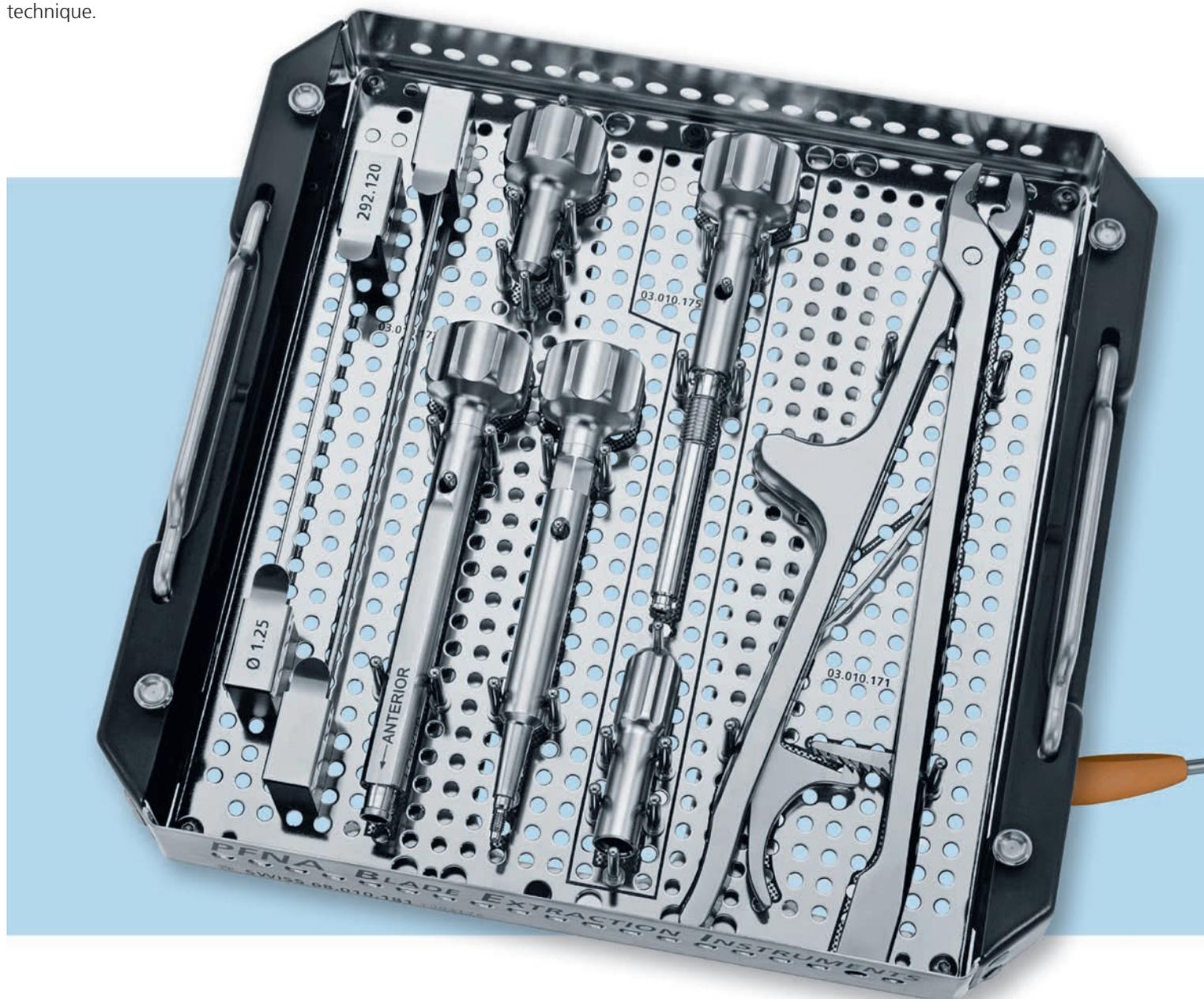
PFNA/PFNA-II. Blade Extraction Set.

Removal of PFNA/PFNA-II blade

The PFNA/PFNA-II blade is usually removed by the extraction screw for PFNA blade 356.825 (see picture page 5).

In certain cases, especially in younger patients with good bone quality, the PFNA/PFNA-II blade can not be removed with the standard surgical technique.

The PFNA/PFNA-II Blade Extraction Set contains new instruments for the extraction of the PFNA/PFNA-II blade in situations where the instruments of the standard set are not sufficient.



Field of application

Implant extraction of PFNA/PFNA-II blade in certain clinical cases of damaged blades.

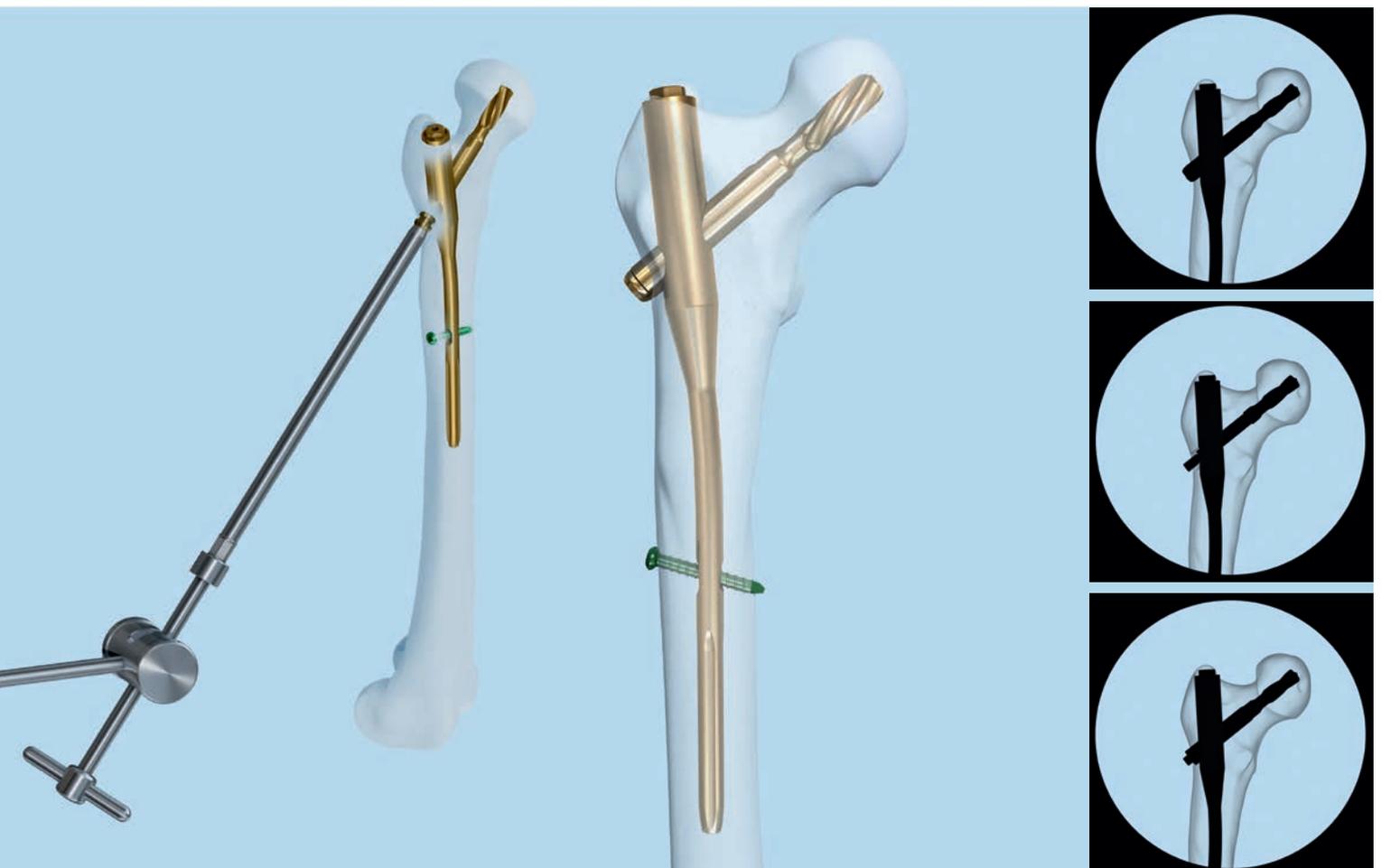
– **Extracted end cap, broken screw or extracted sleeve of blade**

In certain cases when the blade is adhered heavily with the bone (especially in younger patients with good bone quality) the removal of the PFNA/PFNA-II blade is not easy. By applying too much force on

the extraction instruments and the blade it could happen that certain parts get damaged and the removal of the blade is no longer possible with standard instruments.

– **Damaged recess of blade**

Occurs mainly due to incorrect handling (e.g. extraction screw is attached clockwise instead of anti-clockwise). In this case the blade may still be locked and cannot be removed according to a standard surgical technique.



Standard surgical technique for blade removal

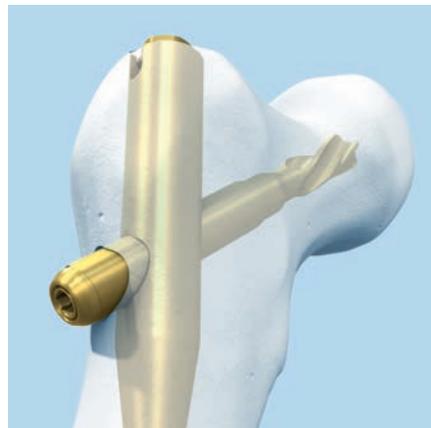
PFNA with PFNA blade

Possible Clinical Cases of Damaged Blades

Damaged recess of blade

Possible solutions

- Use pliers to remove the blade (see step 3 of the surgical technique on page 15)
- Use hook to remove the blade (see step 4 of the surgical technique on page 16)
- Release the blade with drill bits (see step 5 of the surgical technique on page 18)



Extracted end cap of blade

Possible solutions

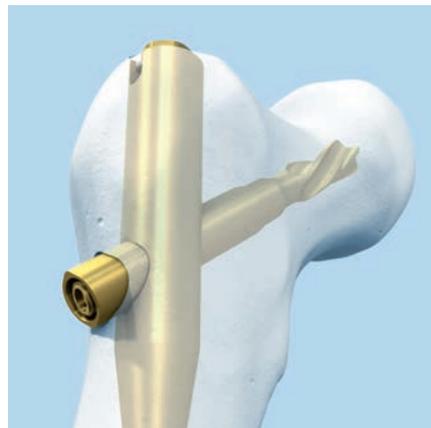
- Use special instrument to remove the sleeve (see step 1 of the surgical technique on page 10)
- Use pliers to remove the blade (see step 3 of the surgical technique on page 15)
- Use hook to remove the blade (see step 4 of the surgical technique on page 16)



Broken screw

Possible solutions

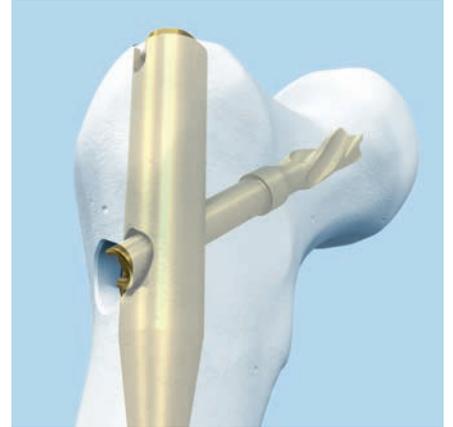
- Use special instrument to remove the sleeve (see step 1 of the surgical technique on page 10)
- Use pliers to remove the blade (see step 3 of the surgical technique on page 15)
- Use hook to remove the blade (see step 4 of the surgical technique on page 16)



Extracted sleeve of blade (w/h screw)

Possible solutions

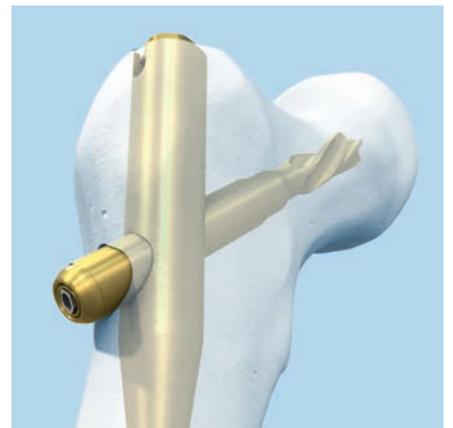
- Use special instrument to remove the blade (see step 2 of the surgical technique on page 12)
- Use pliers to remove the blade (see step 3 of the surgical technique on page 15)
- Use hook to remove the blade (see step 4 of the surgical technique on page 16)



Parts of broken instruments in end part of blade

Possible solutions

- Use pliers to remove the blade (see step 3 of the surgical technique on page 15)
- Use hook to remove the blade (see step 4 of the surgical technique on page 16)
- Release the blade with drill bits (see step 5 of the surgical technique on page 18)



General Notes

357.117 Hammer Guide for DFN, for No. 357.026



03.010.124 Combined Hammer 500 g,
can be mounted, for No. 357.117



357.026 Slotted Hammer 400 g, can be mounted



- If there is no Proximal Femoral Nail Removal Set for PFN, TFN and PFNA/PFNA-II (01.010.180) available, use the hammer guide (357.117) and the hammer (03.010.124 or 357.026) from the Radiolucent Instrument Set for Expert Tibial Nail (01.004.013) or the DFN Distal Femoral Nail Set.

If using any other hammer guide, make sure it is cannulated or do not use the guide wire for implant removal as described in this technique guide.

Notes:

- If the extraction of the PFNA/PFNA-II blade is difficult, remove the locking bolt and the end cap and mobilize the nail to loosen the nail-blade connection.
 - To detach the blade from the bone, use light hammer blows to slightly drive in the blade before removal of the blade.
-

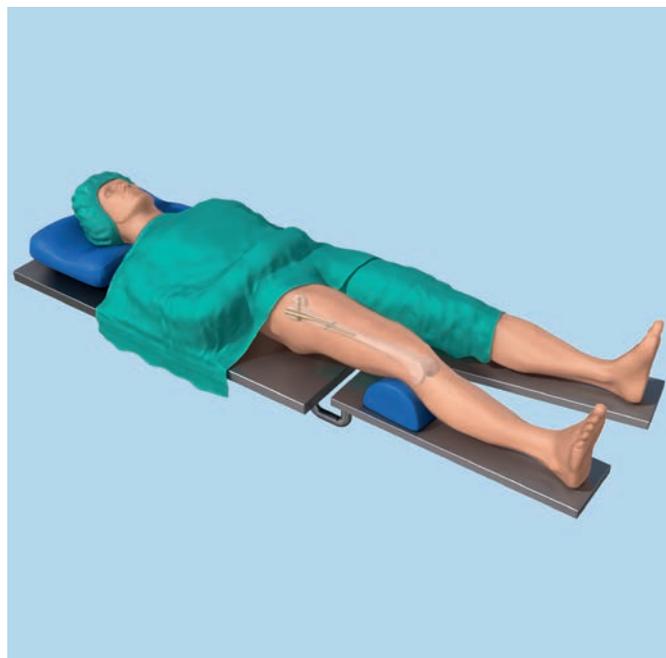
Patient Positioning

1

Position patient

Position the patient supine on an extension table or a radio-lucent operating table. Abduct the unaffected leg as far as possible and place it on a leg support, so that it allows free fluoroscopic examinations. This should be tested preoperatively.

For an unimpeded access to the medullary cavity, abduct the upper body by about 10–15° to the unaffected side (or adduct the affected leg by 10–15°).



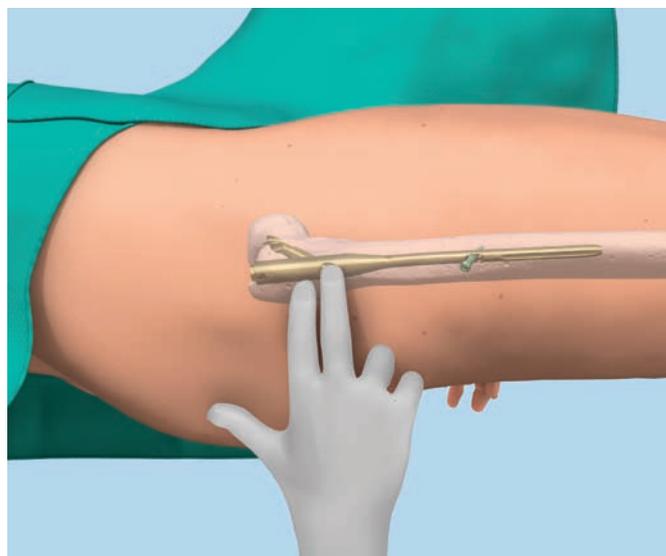
2

Approach

- After an incision through the old scars, locate the blade by palpation or under image intensification.

Precautions:

- Instruments and screws may have sharp edges or moving joints that may pinch or tear user's glove or skin.
- Handle devices with care and dispose worn bone cutting instruments in an approved sharps container.



Extraction of PFNA/PFNA-II Blade

1

Extraction of the sleeve of the blade

Instruments

356.830	Guide Wire Ø 3.2 mm, for PFNA Blade
03.010.174	Adapter for Sleeve for Removal of PFNA Blades
03.010.170	Hammer Guide
03.010.124	Combined Hammer 500 g, can be mounted, for No. 357.117

Note: This step can only be performed if the end cap of the blade is removed.

Insert the guide Wire through the cannulated PFNA/PFNA-II blade. Monitor the insertion depth of the guide wire with the image intensifier to avoid penetration of the articular surface.

Screw the hammer guide to the adapter for sleeve and insert the assembly over the guide wire into the sleeve of the blade.

Note: To insert the adapter, the hole on the adapter must be in vertical position (note "ANTERIOR" marking on the adapter shaft). To lock the adapter, turn the adapter 90°. The hole on the adapter shaft must now be in a horizontal position (note "LOCKED" marking on the adapter shaft).



Remove the sleeve by applying gentle hammer blows with the combined hammer.

If the removal of the sleeve is not possible at this point, proceed with step 3 "Extraction of the ablade with pliers" or step 4 "Extraction of the blade with extraction hook". Also consider the general notes on page 16.



2a

Option A: Extraction of the blade with adapter for blade

Instruments

03.010.175	Adapter for Blade for Removal of PFNA Blades
03.010.170	Hammer Guide
03.010.124	Combined Hammer 500 g, can be mounted, for No. 357.117

Note: These steps can only be performed if the end cap and the sleeve of the blade are removed.

After removal of the sleeve, remove the small screw inside of the blade.

Note: The removal of the small screw is not possible if the screw is inside the nail. In this case proceed with step 3 "Extraction of the blade with pliers" or step 4 "Extraction of the blade with extraction hook". Also consider the general notes on page 8.

Screw the hammer guide to the adapter for blade and attach the assembly into the T-slot of the blade. Screw the nut over the end of the blade to lock the blade to the adapter.

Remove the blade by applying gentle hammer blows with the combined hammer.



Alternative

Instruments

03.010.175	Adapter for Blade for Removal of PFNA Blades
356.830	Guide Wire Ø 3.2 mm, for PFNA Blade
03.010.170	Hammer Guide
03.010.124	Combined Hammer 500 g, can be mounted, for No. 357.117

Note: These steps can only be performed if the end cap and the sleeve of the blade are removed.

After removal of the sleeve, remove the small screw inside of the blade.

Note: The removal of the small screw is not possible if the screw is inside the nail. In this case proceed with step 3 "Extraction of the blade with pliers" or step 4 "Extraction of the blade with extraction hook". Also consider the general notes on page 8.

Attach the adapter for blade into the T-slot of the blade.

- Insert a guide wire through the adapter and the blade to fix the adapter to the blade. Monitor the insertion depth of the guide wire with the image intensifier to avoid penetration of the articular surface.
- ①

Screw the hammer guide to the adapter. Remove the blade by applying gentle hammer blows with the combined hammer.



2b

Option B: Extraction of the blade with adapter with thread

Instruments

03.010.176	Adapter with thread, for Blade for Removal of PFNA Blades
03.010.170	Hammer Guide
03.010.124	Combined Hammer 500 g, can be mounted, for No. 357.117

Note: These steps can only be performed if the end cap and the sleeve of the blade are removed.

After removal of the sleeve, remove the small screw inside of the blade.

Note: The removal of the small screw is not possible if the screw is inside the nail. In this case proceed with step 3 "Extraction of the blade with pliers" or step 4 "Extraction of the blade with extraction hook". Also consider the general notes on page 8.

Screw the hammer guide to the adapter with thread and screw the assembly to the inner recess of the blade.

Remove the blade by applying gentle hammer blows with the combined hammer.

Precaution: Do not apply bending forces when hammering out the blade.



3

Extraction of the blade with pliers

Instruments

03.010.171	Pliers for Removal of PFNA Blades
03.010.170	Hammer Guide
03.010.124	Combined Hammer 500 g, can be mounted, for No. 357.117

Note: The following steps can be performed to remove the whole PFNA/PFNA-II blade, the blade part or the end cap only. When removing only the end cap proceed with step 1 "Extraction of the sleeve of the blade" after removal of the end cap. Also consider the general notes on page 8.

Grasp the blade with the pliers and clamp it strongly.

Screw the hammer guide to the pliers. Remove the blade by applying gentle hammer blows with the combined hammer.



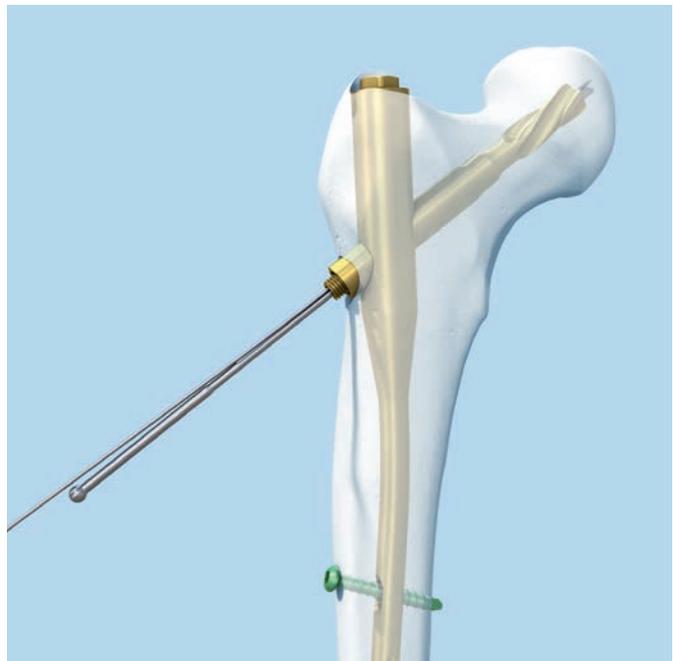
4**Extraction of the blade with hook****Instruments**

03.010.172	Hook for Removal of PFNA Blades
292.120	Kirschner Wire Ø 1.25 mm with trocar tip, length 150 mm, Stainless Steel
03.010.173	Adapter for Hooks for Removal of PFNA Blades
03.010.170	Hammer Guide
03.010.124	Combined Hammer 500 g, can be mounted, for No. 357.117

Note: The following steps can be performed to remove the whole PFNA/PFNA-II blade or the blade part only. Also consider the general notes on page 8.

Insert the hook through the cannulation and insert the K-wire to fix the hook in the cannulation. Insert an additional K-wire if the hook can not be fixed in the cannulation of the blade.

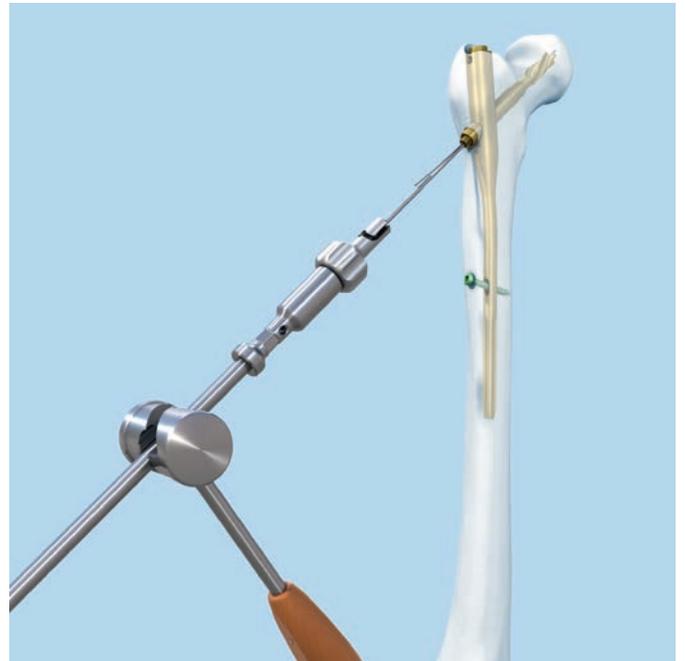
Precaution: The K-wire is inserted at the “flat surface” on the opposite side of the hook. Check the insertion depth of the hook and of the K-wire with the image intensifier to avoid penetration of the articular surface. The end of the hook and K-wire should be placed at the end of the blade.



Screw the hammer guide to the adaptor for hooks and attach the assembly to the hook.

Remove the blade by applying gentle hammer blows with the combined hammer. Do not apply excessive force.

Precaution: There is a possible risk of jamming the instruments in the cannulation of the blade or to tear off parts of the instruments which could advance into the femoral head when applying excessive force. Use the extraction of the blade with hook only as a last option.



5 Drilling

Instruments

01.900.020	Extraction Set for Standard Screws
530.010	Power Drive, complete (2 Battery Casings, 2 Batteries and 2 Sterile Covers)
309.006S	Carbide Drill Bit Ø 6.0 mm for Instrument Steel and Titanium, sterile
309.504S	HSS Drill Bit Ø 3.5 mm for Implant Steel, sterile

Note: The drilling can only be performed in combination with the Screw Extraction Set and the corresponding handling technique (DSEM/TRM/0614/0104).

If necessary, parts of the blade or the cannulation can be drilled to allow removal of the blade according to steps 1 to 4.

When drilling, cool with the drill suction device and aspirate the drill chips. Use the 6 mm carbide drill bit to drill the little screw to remove the end cap and/or the screw and to unlock the blade. Proceed with step 1 "Extraction of the sleeve of the blade" or step 2 "Extraction of the blade with adapter" if the sleeve is already removed.

Use the 3.5 mm HSS drill bit to drill the cannulation if it is blocked by parts of broken instruments.

Precaution: For opening the cannulation just drill as far as necessary to avoid debris advancing into the femoral head.



Instruments

Standard Instruments

03.010.124 Combined Hammer 500 g,
can be mounted, for No. 357.117



03.010.170 Hammer Guide



03.010.171 Pliers for Removal of PFNA Blades



03.010.172 Hook for Removal of PFNA Blades



03.010.173 Adapter for Hooks for Removal of PFNA
Blades



03.010.174 Adapter for Sleeve for Removal of PFNA
Blades



03.010.175 Adapter for Blade for Removal of PFNA
Blades



03.010.176 Adapter with thread, for Blade for Removal
of PFNA Blades



292.120 Kirschner Wire \varnothing 1.25 mm with trocar tip,
length 150 mm, Stainless Steel

356.830 Guide Wire \varnothing 3.2 mm, for PFNA Blade

Optional Instruments

309.004S Carbide Drill Bit Ø 4.0 mm for Instrument Steel and Titanium, sterile



309.006S Carbide Drill Bit Ø 6.0 mm for Instrument Steel and Titanium, sterile



309.504S HSS Drill Bit Ø 3.5 mm for Implant Steel, sterile



309.506S HSS Drill Bit Ø 4.8 mm for Implant Steel, sterile



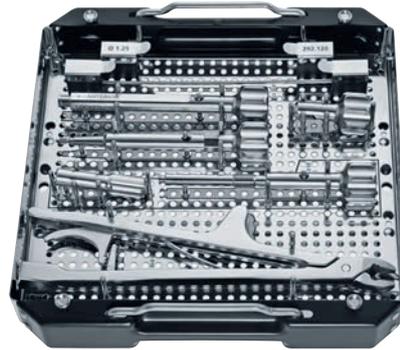
356.830S Guide Wire Ø 3.2 mm, for PFNA Blade



Sets

68.010.181 Vario Case for Instruments for Extraction of PFNA Blades

68.010.181.01 Bottom, size 1/2, for Vario Case No. 68.010.181



68.010.180 Vario Case for Instruments for Removal of Proximal Femoral Nails

68.010.180.01 Bottom, size 1/1, for Vario Case No. 68.010.180

68.010.180.02 Insert, size 1/1, for Vario Case No. 68.010.180

