

Distal Radius Plate 2.4/2.7 dorsal and volar

Surgical Technique



This publication is not intended for distribution in the USA.

Instruments and implants approved by the AO Foundation.

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 Image intensifier control

Warning

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.depuysynthes.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.depuysynthes.com/hcp/reprocessing-care-maintenance>

Indications

Indications

Distal Radius Plate 2.4/2.7, dorsal

- Complex intra- and extra-articular fractures of the distal radius with dorsal tilt
- Corrective osteotomies of the distal radius

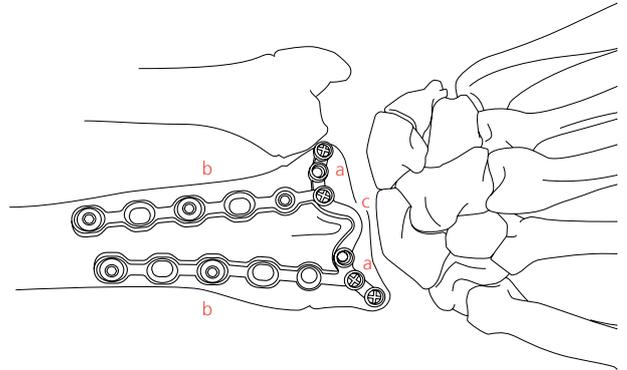
Distal Radius Plate 2.4/2.7, volar

- Complex intra- and extra-articular fractures of the distal radius with volar tilt
- Corrective osteotomies of the distal radius

Implants

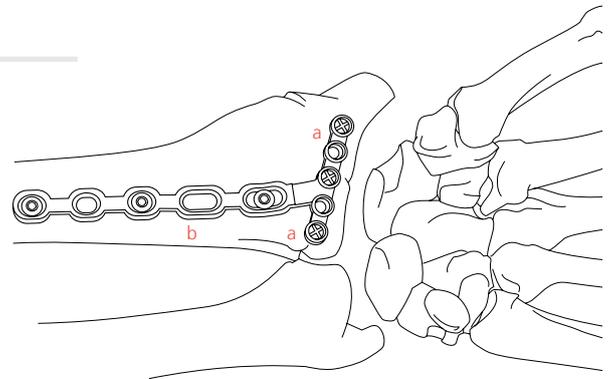
Distal Radius Plate 2.4/2.7, dorsal (242.470/442.470 right, and 242.480/442.480 left)

- a Distal limbs
- b Proximal longitudinal limbs
- c Interconnecting band



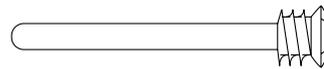
Distal Radius Plate 2.4/2.7, volar (242.471/442.471 right, and 242.481/442.481 left)

- a Distal limbs
- b Proximal longitudinal limbs



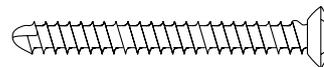
Buttress Pin \varnothing 1.8 mm (201.9XX/401.9XX)

With threaded screw head for a fixation of bone fragments at a stable angle. Prevents bone fragments from tilting. Application mostly in osteoporotic bone.



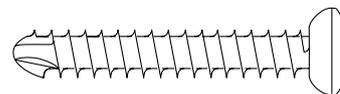
Self-tapping Cortex Screw \varnothing 2.4 mm (201.6XX/401.6XX)

Fixation of distal limbs of the plate. Angulation of the screw in distal plate holes is possible.



Self-tapping Cortex Screw \varnothing 2.7 mm (202.8XX/402.8XX)

Fixation of proximal longitudinal limbs of the plate.



All implants are available in Pure Titanium and Stainless Steel.

Surgical technique

The following surgical technique is shown on the example of a dorsal Distal Radius Plate.

The application technique of the volar Distal Radius Plate is the same.

1

Patient positioning

Position the wrist in extension.

2

Surgical approach

The application of the dorsal Distal Radius Plate requires a straight longitudinal incision over the Lister's tubercle. The skin is incised between the second and the third extensor compartment.

The fracture is exposed through the third, or through the third and the fourth dorsal extensor compartment. The second and fourth dorsal compartment are elevated subperiosteally from the distal radius, which at the end of an intervention represents an advantage when covering the plate.

(See Ring et al., Journal of Hand Surgery, American Vol., Vol. 22A, 1997)

Temporary fixation (optional)

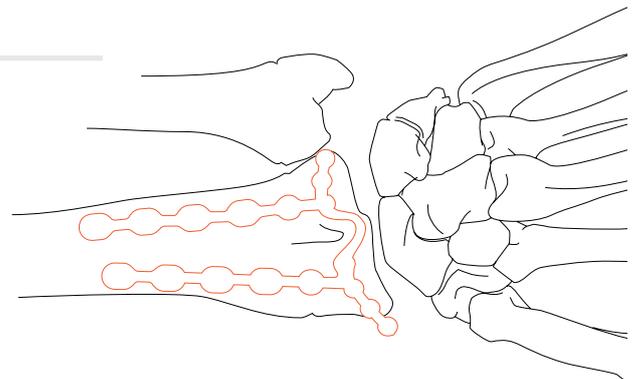
The fracture may be stabilized temporarily using K-wires, the Mini Lengthening Apparatus (394.080), the Small External Fixator (186.400) or finger distraction, which simplifies the reduction of complex fractures or osteotomies.

3

Contouring the bending template

The Bending Template (329.600) can be applied for both the left and the right hand. Contour the bending template in relation to the distal radius. Make sure the interconnecting band wraps exactly around the Lister's tubercle. Verify the plate length.

Note: It is not necessary to remove the Lister's tubercle.

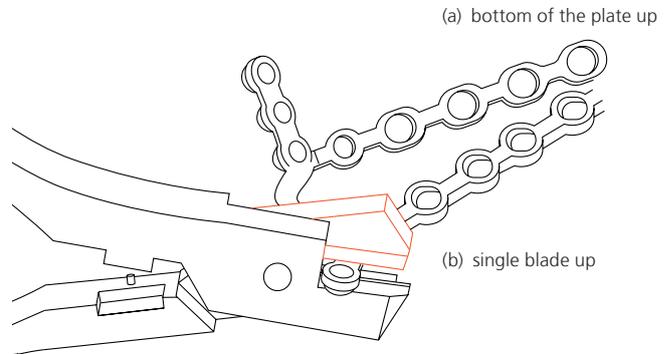


4

Plate cutting

Use the Plate Cutter (391.951) to shorten the plate.

To prevent the plate holes from being distorted, make sure the bottom of the plate is facing up when inserted into the cutter (a), while the portion of the cutter with one blade only is also facing up (b). Do not cut the plate through a screw hole.

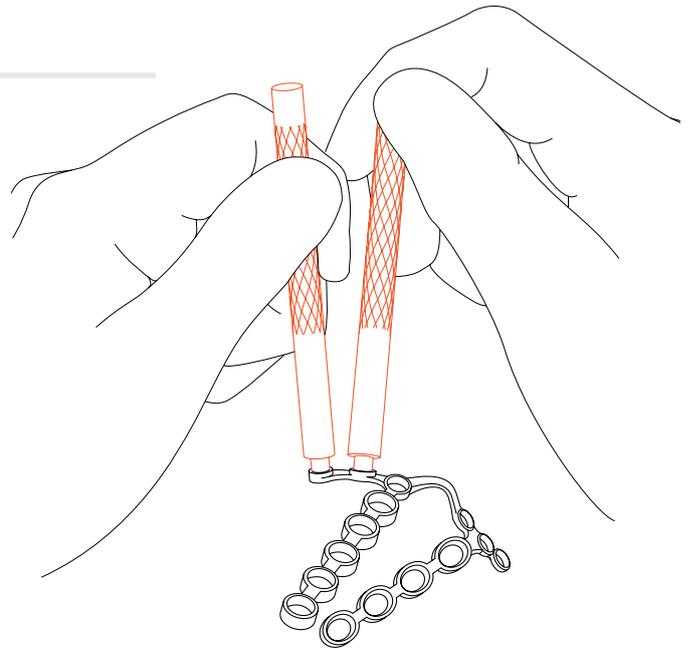


5

Plate contouring

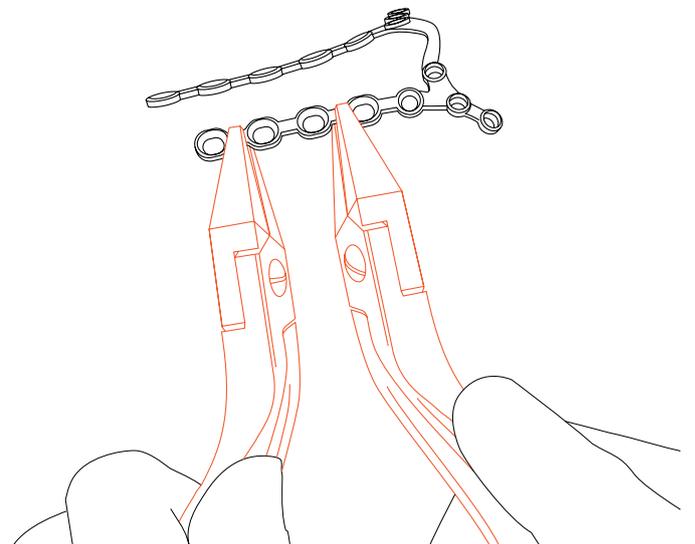
The plate is anatomically precontoured. Use the pointed Universal Pliers (347.901) and the Bending Pins with Thread (329.090) to contour the plate to the template.

Use a pair of bending pins to contour the distal limbs. Additional precision contouring of the distal limbs can also be accomplished *in situ* using bending pins.



The proximal longitudinal limbs are contoured using pointed pliers.

Note: Avoid bending the plate back and forth.



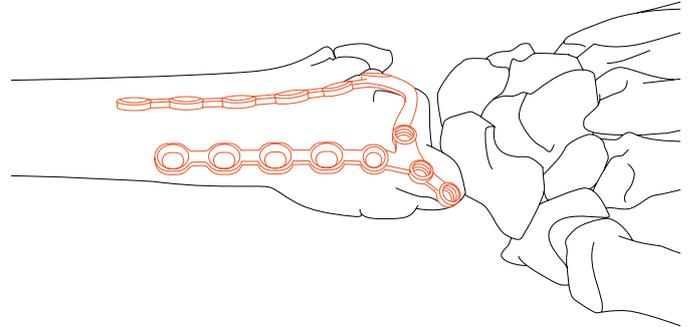
6

Plate positioning

Position the plate on the bone. First secure the distal limbs and then the proximal longitudinal limbs.

Alternative

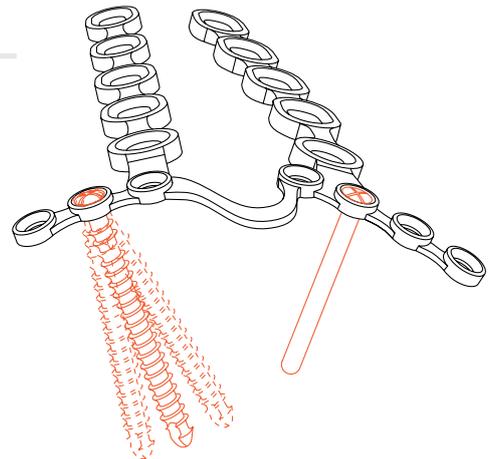
To contour the distal limbs in situ, first insert one screw into each proximal limb.



7

Implant selection for distal limb fixation

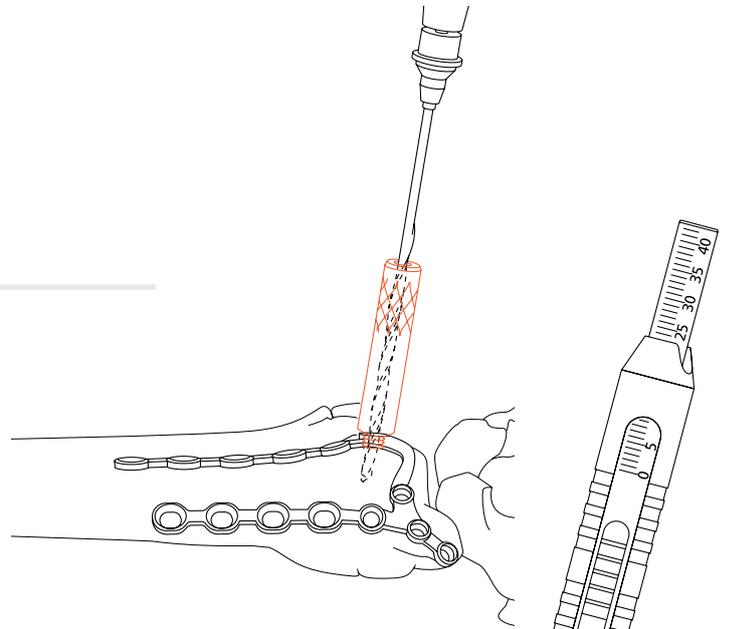
To secure the distal limbs, buttress pins \varnothing 1.8 mm and self-tapping cortex screws \varnothing 2.4 mm, or a combination of both screw types may be used.



8a

Distal fixation with Buttress Pins \varnothing 1.8 mm (201.9XX/401.9XX)

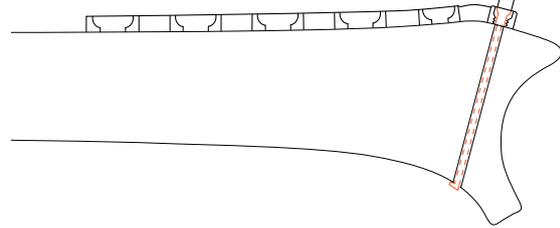
Perpendicular predrilling is necessary to ensure accurate anchorage of the buttress pin in the plate hole. Screw the Drill Sleeve 1.8 with Centering Thread (312.920) into the plate hole. Use the Drill Bit \varnothing 1.8 mm (310.510) for drilling.



8b

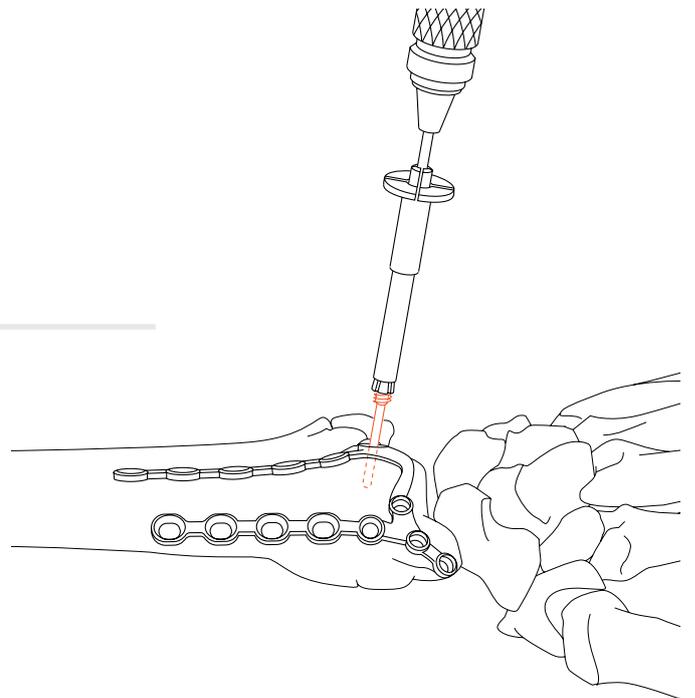
Remove the drill sleeve and determine the length of the buttress pin using the Depth Gauge (319.005). Place the depth gauge through the plate hole onto the bone.

The buttress pin need not be anchored in the far cortex. Select the length of the buttress pin which corresponds to the measured length.



8c

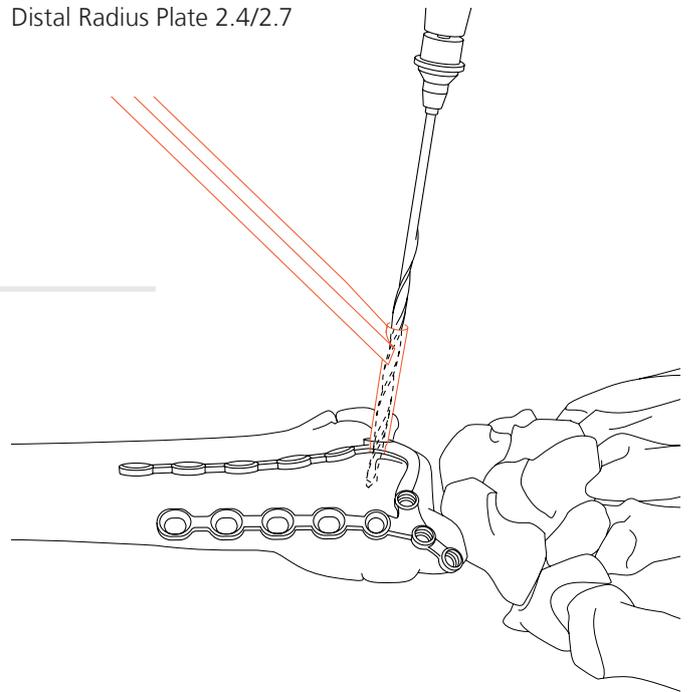
- Press the buttress pin into the predrilled hole and screw the head of the buttress pin into the plate hole using the cruciform Screwdriver Shaft (314.670) with Handle (311.012).



9a**Distal fixation with self-tapping Cortex Screws****Ø 2.4 mm (201.6XX/401.6XX)**

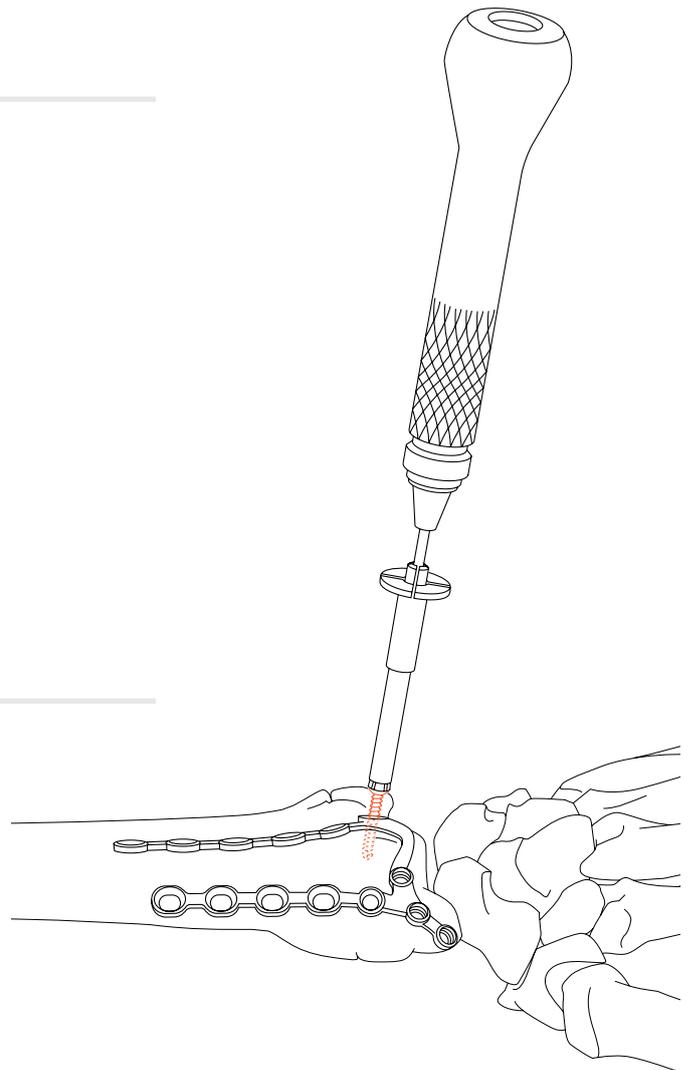
Predrill the self-tapping cortex screws Ø 2.4 mm using the Drill Bit Ø 1.8 mm and the Double Drill Sleeve 2.4/1.8 (312.181).

If the cortex screw Ø 2.4 mm is used as a lag screw, use the drill bit Ø 2.4 mm to predrill the gliding hole and the drill bit Ø 1.8 mm to predrill the threaded hole.

**9b**

Measure the length as described in step 7.

To anchor the cortex screw Ø 2.4 mm in the far cortex, select a screw length which is slightly longer than the depth measured.

**9c**

Insert the selected cortex screw Ø 2.4 mm into the pre-drilled hole using the cruciform Screwdriver Shaft (314.670) with Handle (311.012).

10a

Proximal fixation with self-tapping Cortex Screws

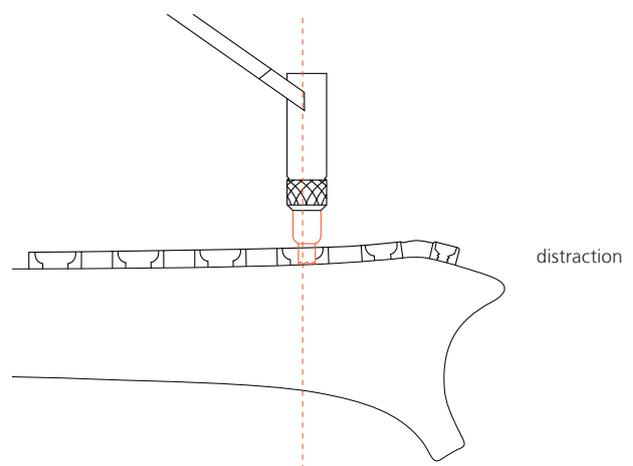
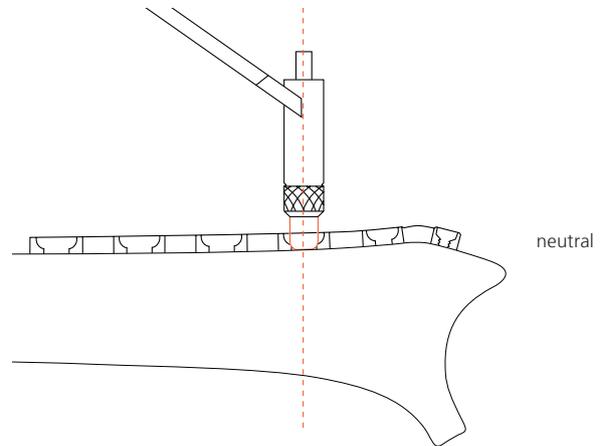
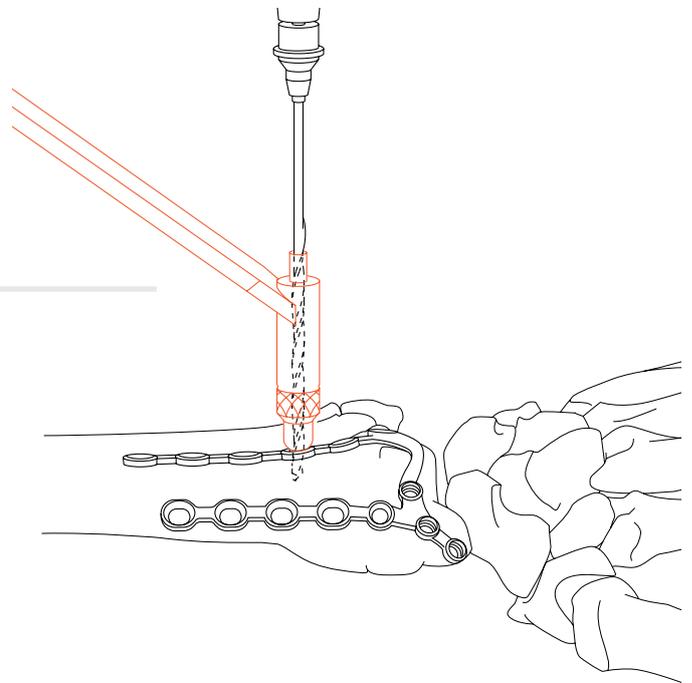
Ø 2.7 mm (202.8XX/402.8XX)

Use the Drill Bit Ø 2.0 mm and the Universal Drill Sleeve 2.7 (323.260) to predrill the cortex screws Ø 2.7 mm.

The screws can be inserted in neutral position or to achieve compression or distraction.

For a neutral position, press the Universal drill sleeve 2.7 firmly into the plate hole.

To achieve distraction, place the drill sleeve on the distal end of the plate hole. To achieve compression, place the drill sleeve on the proximal end of the plate hole.



10b

Remove the drill sleeve and determine the screw length using the Depth Gauge (319.010). Place the depth gauge through the plate hole onto the bone.

Select a screw length which is longer than the measured depth to anchor the cortex screw \varnothing 2.7 mm in the far cortex.

10c

 Insert the selected cortex screw \varnothing 2.7 mm with the small Hexagonal Screwdriver (314.020).

11

Wound closure and postoperative care

It is important that the distal limbs be covered. This can be achieved by pulling the flap of the extensor retinaculum under the radial extensor tendons. To facilitate suturing, the extensor-pollicis-longus tendon remains dorsally and radially displaced above the retinaculum.

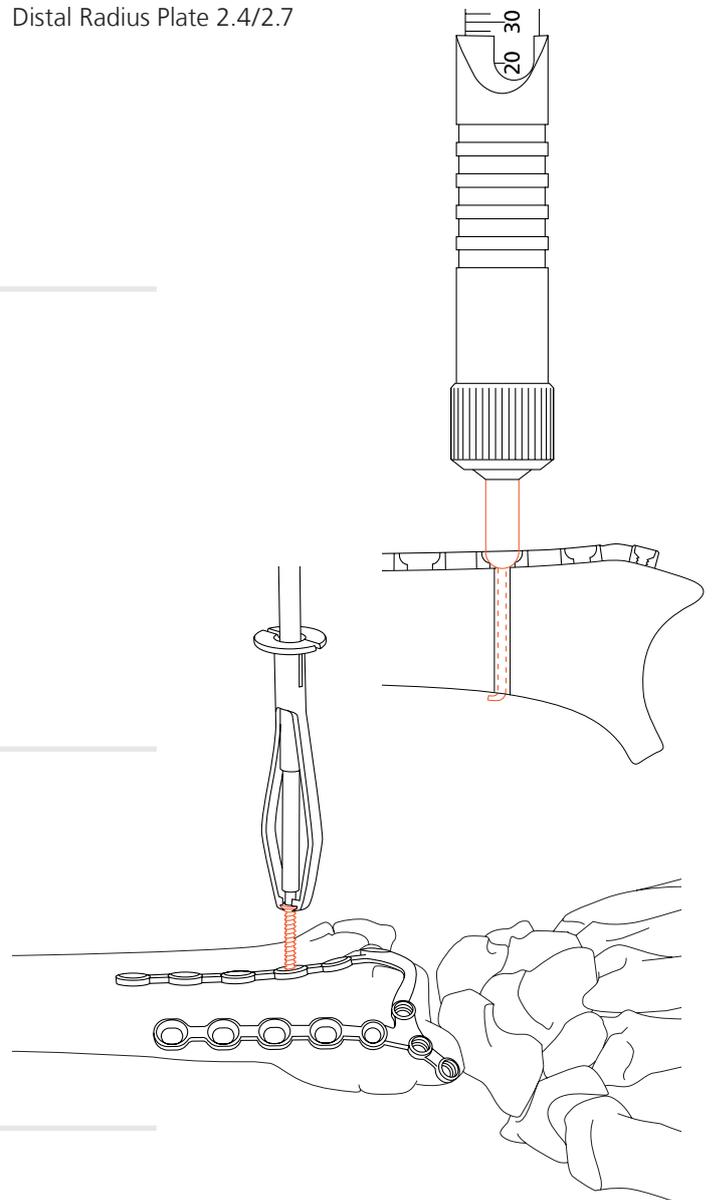
Use a drainage. Close the wound and apply a dressing and a volar splint. If the fixation is stable and safe, begin mobilisation and active exercise immediately.

12

Implant removal

Once the healing process is completed, the plate should be removed immediately to avoid inflammations of the overlying extensor tendons.

For removal of the cortex screw \varnothing 2.4 mm, the use of the Screwdriver Shaft 2.4 (314.448) and the Handle (311.420) is recommended.



Bibliography

Ring D., Jupiter J. (1996): A New Plate for Internal Fixation of the Distal Radius. *AO/ASIF Dialogue*, Vol. IX, Nr. 1, 1996, 1–3

Ring D., Jupiter J. (1997): Dorsal Fixation of the Distal Radius Using the π Plate. *Atlas of the Hand Clinics*, Vol. 2, Nr. 1, 1997, 25–44

Ring D., Jupiter J., Brennwald J., Büchler U., Hastings H. II (1997): Prospective Multicenter Trial of Plate for Dorsal Fixation of Distal Radius Fractures. *Journal of Hand Surgery, American Volume*, Vol. 22A, Nr. 5, 1997, 777–784

Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-06e1 and ASTM F2119-07

Non-clinical testing of worst case scenario in a 3 T MRI system did not reveal any relevant torque or displacement of the construct for an experimentally measured local spatial gradient of the magnetic field of 3.69 T/m. The largest image artifact extended approximately 169 mm from the construct when scanned using the Gradient Echo (GE). Testing was conducted on a 3 T MRI system.

Radio-Frequency-(RF-)induced heating according to ASTM F2182-11a

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.5 °C with an average temperature rise of 6.6 °C (1.5 T) and a peak temperature rise of 5.9 °C (3 T) under MRI Conditions using RF Coils [whole body averaged specific absorption rate (SAR) of 2 W/kg for 6 minutes (1.5 T) and for 15 minutes (3 T)].

Precautions: The above mentioned test relies on non-clinical testing. The actual temperature rise in the patient will depend on a variety of factors beyond the SAR and time of RF application. Thus, it is recommended to pay particular attention to the following points:

- It is recommended to thoroughly monitor patients undergoing MR scanning for perceived temperature and/or pain sensations.
 - Patients with impaired thermo regulation or temperature sensation should be excluded from MR scanning procedures.
 - Generally it is recommended to use a MR system with low field strength in the presence of conductive implants. The employed specific absorption rate (SAR) should be reduced as far as possible.
 - Using the ventilation system may further contribute to reduce temperature increase in the body.
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