

LCP Ulna Osteotomy System 2.7.

Low profile angular stable fixation for ulna shortening osteotomies.

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

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:

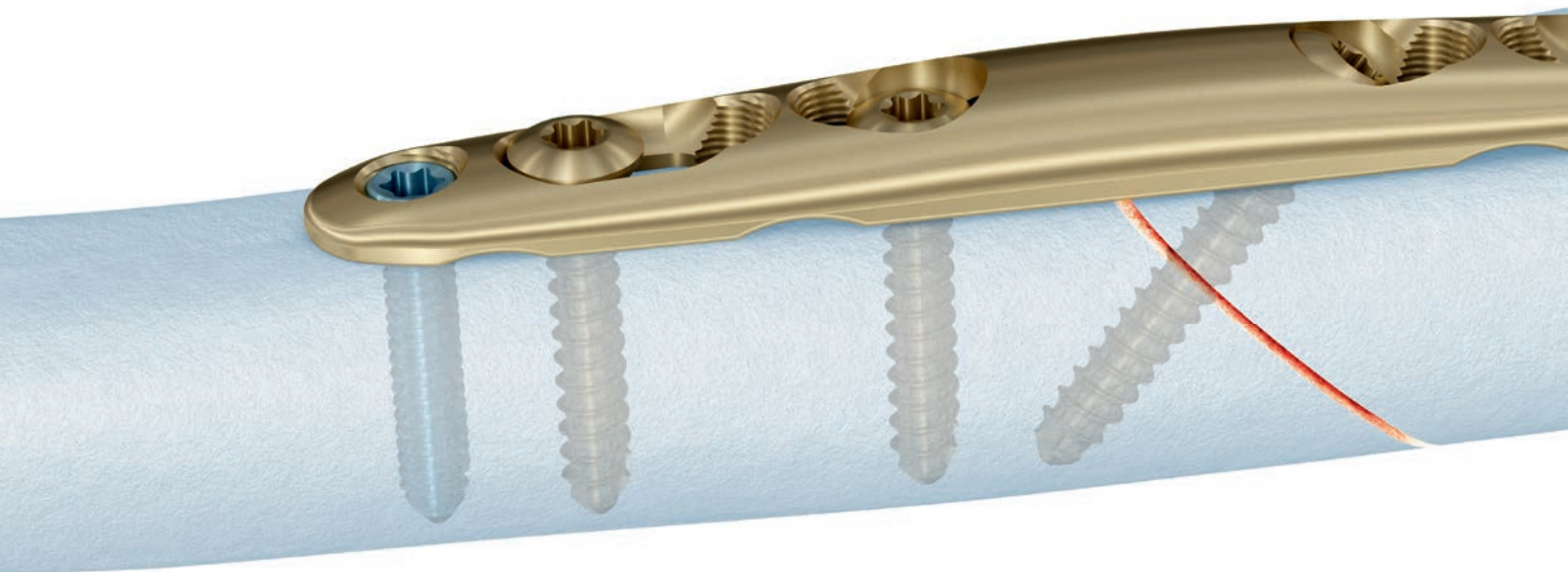
<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

LCP Ulna Osteotomy System 2.7.

Low profile angular stable fixation for ulna shortening osteotomies.

Low profile angular stable plates

- With rounded edges and tapered ends to minimize risk of soft tissue irritation
- Stable fixation with \varnothing 2.7 mm locking and cortex screws
- Available in stainless steel or titanium alloy



Parallel saw blades for transverse and oblique osteotomy cuts

- Available for transverse and oblique osteotomy cuts in five different widths for 2, 2.5, 3, 4 and 5 mm shortening
- For precise parallel osteotomy cuts
- Compatible with Synthes Colibri with Oscillating Saw Attachment



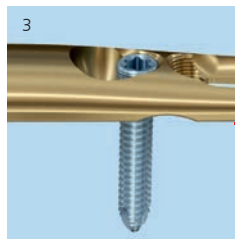
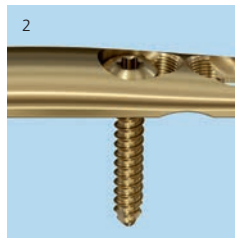
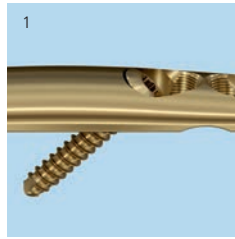
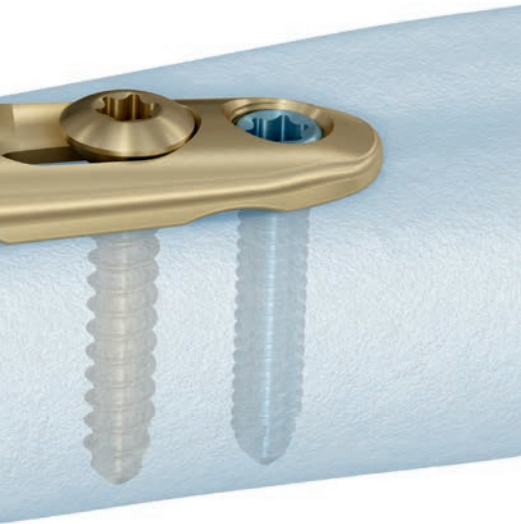
Drill templates

- For predrilling of plate fixation holes before osteotomy cut to ensure correct rotational alignment
- Saw guide can be mounted for easier start of 45° oblique osteotomy cut

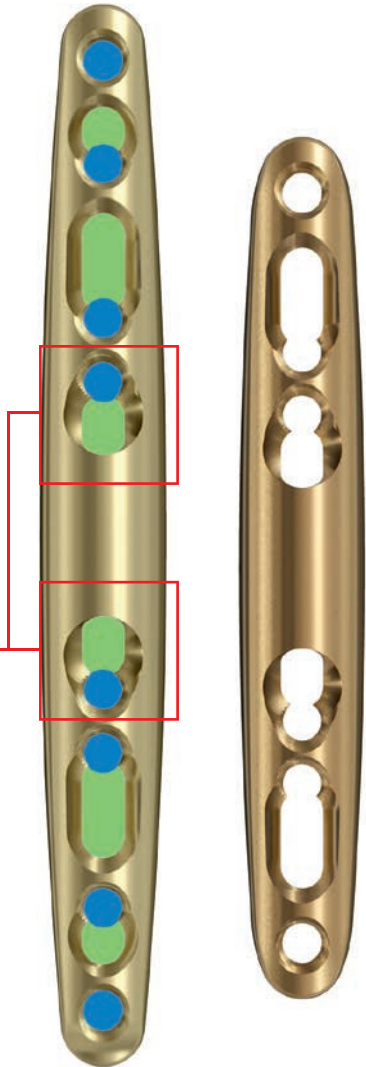
Designed for transverse and oblique osteotomies

Three-part combi-hole for flexible screw placement:

- Lag screw for use in oblique osteotomies (1)
- Neutral cortex screw (2)
- Locking screw (3)
- Symmetric plate design



- Ø 2.7 mm Locking screw
- Ø 2.7 mm Cortex screw



Compression/distraction instrument

- Allows for compression and distraction after the osteotomy
- For Kirschner Wires up to Ø 2.0 mm
- To aid in reduction and compression of the cut bone ends
- Two fixation options on each side of the osteotomy
- Can be used in combination with drill templates
- Freehand application for shortenings >5 mm



Indications

Primary ulnar impaction syndrome

- Degenerative triangular fibrocartilage complex (TFCC) tears
- Lunotriquetral tears

Secondary ulnar impaction syndrome

- Incongruity (length discrepancy) of the distal radial-ulnar joint following distal radius fracture
- Traumatic triangular fibrocartilage complex (TFCC) tears

AO Principles

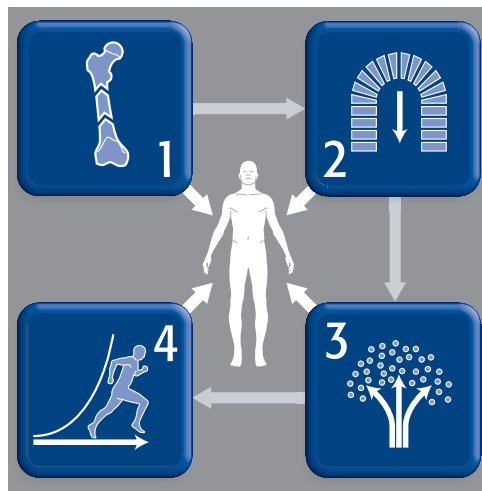
In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation^{1,2}.

Anatomic reduction

Fracture reduction and fixation to restore anatomical relationships.

Early, active mobilization

Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.



Stable fixation

Fracture fixation providing absolute or relative stability, as required by the patient, the injury, and the personality of the fracture.

Preservation of blood supply

Preservation of the blood supply to soft tissues and bone by gentle reduction techniques and careful handling.

¹ Müller ME, M Allgöwer, R Schneider, H Willenegger. Manual of Internal Fixation. 3rd ed. Berlin, Heidelberg, New York: Springer. 1991

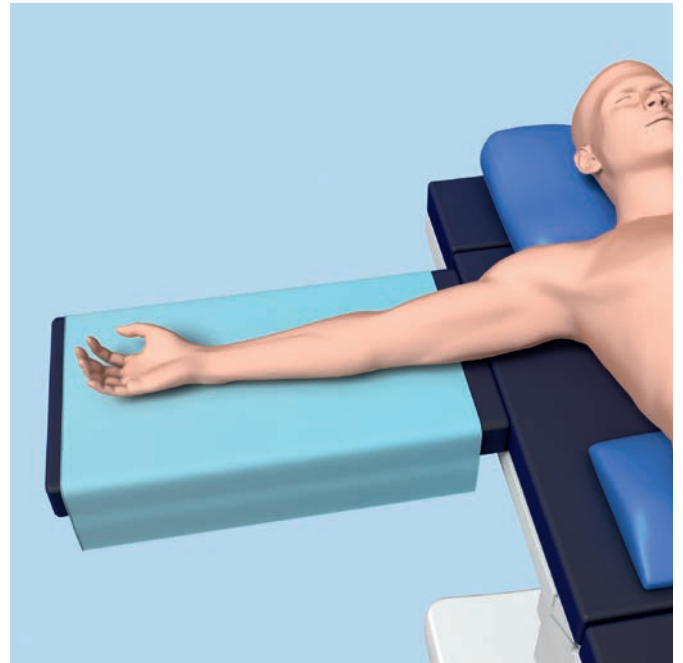
² Rüedi TP, RE Buckley, CG Moran. AO Principles of Fracture Management. 2nd ed. Stuttgart, New York: Thieme. 2007

Preparation and Approach

1

Patient positioning

Place the patient in a supine position with the forearm positioned on a hand table in full supination and the shoulder in 90° abduction. The use of a tourniquet and magnifying loops is recommended.



2

Approach

Make a longitudinal incision to approach the volar side of the ulna.

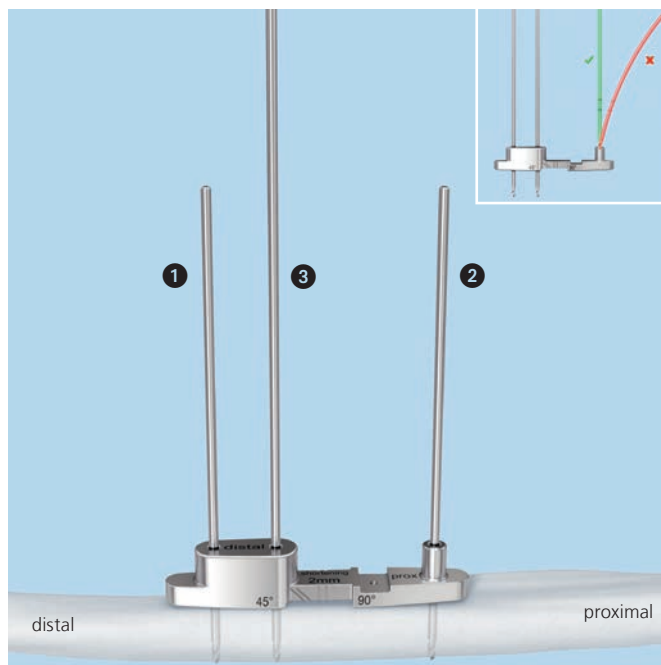
Precaution: Take care not to damage the dorsal sensory branch of the ulnar nerve.



Position and Fix Drill Template

Instruments

03.111.900	Drill Template for LCP Ulna Osteotomy Plate 2.7, for 2.0 mm shortening
03.111.901	Drill Template for LCP Ulna Osteotomy Plate 2.7, for 2.5 mm shortening
03.111.902	Drill Template for LCP Ulna Osteotomy Plate 2.7, for 3.0 mm shortening
03.111.903	Drill Template for LCP Ulna Osteotomy Plate 2.7, for 4.0 mm shortening
03.111.904	Drill Template for LCP Ulna Osteotomy Plate 2.7, for 5.0 mm shortening
02.111.902.01	Kirschner Wire \varnothing 2.0 mm with drill tip, length 100 mm, Stainless Steel
02.111.903.01	Kirschner Wire \varnothing 2.0 mm with drill tip, length 150 mm, Stainless Steel

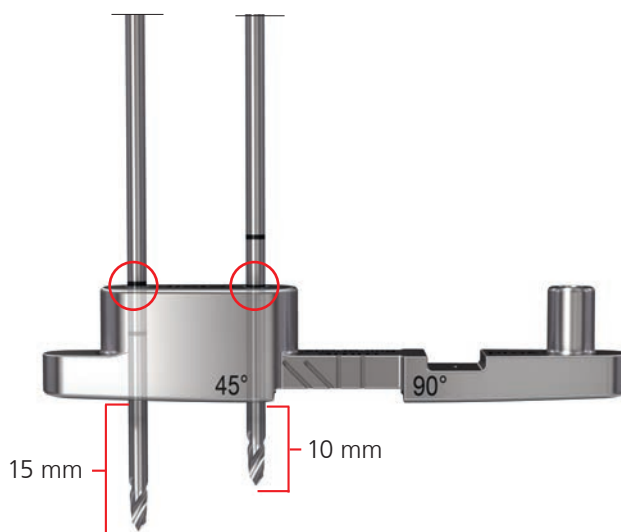


Choose the drill template according to the intended amount of shortening.

Position the drill template on the bone and fix it bicortically with the Kirschner wires \varnothing 2.0 mm with drill tip. Two lengths of Kirschner wires are available. For the fixation of the drill template at both ends, start distally and use 100 mm Kirschner wires (02.111.902.01 ①②) to avoid space constraints when inserting the third, 150 mm Kirschner wire (02.111.903.01 ③).

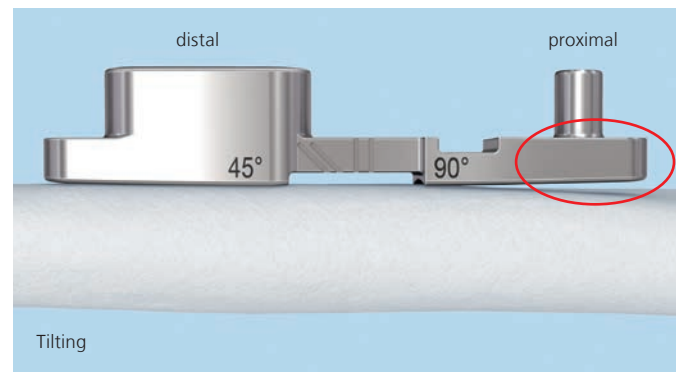
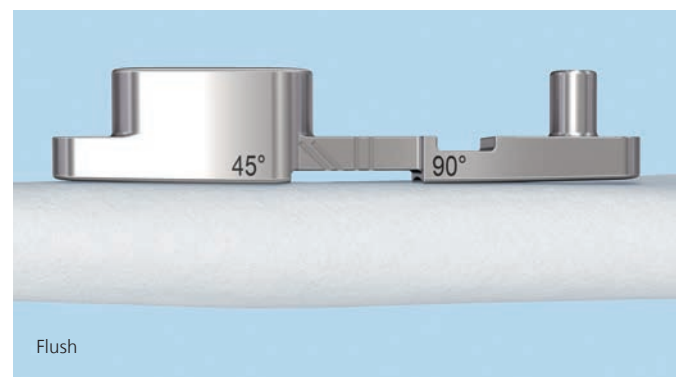
The circular laser markings on the Kirschner wires can be used as a guide for insertion depth: the first marking indicates insertion depth 10 mm, the second marking 15 mm (reading at the edge of the drill template).

Do not start drilling before Kirschner wire tip is in contact with the bone. Avoid off-axis insertion of the Kirschner wire.



Notes:

- Make sure the drill template is correctly oriented proximally and distally according to the etchings.
- The shape of the drill template is identical to the shape of the 6-hole LCP Ulna Osteotomy Plate (02.111.900/04.111.900).
- Ensure that the drill template lies centrally on the bone for proper plate placement.
- Confirm the placement of the drill template with the image intensifier.
- Both ends of the drill template should sit flush on the bone when inserting the Kirschner wires; otherwise the plate may need to be bent to fit the patient anatomy.
- If the ulnar bone is slightly convex, the drill template may not sit flush on the bone and could tilt. If the template is tilting, ensure that the distal end is kept flush on the bone when inserting the Kirschner wires.



A Transverse Osteotomy

1

Perform transverse osteotomy

Instruments for transverse osteotomy cut

532.081S	Saw Blade, parallel, 47.1/25 × 12 × 2.0 mm, cut 90°, shortening 2.0 mm, sterile
532.082S	Saw Blade, parallel, 47.1/25 × 12 × 2.5 mm, cut 90°, shortening 2.5 mm, sterile
532.083S	Saw Blade, parallel, 47.1/25 × 12 × 3.0 mm, cut 90°, shortening 3.0 mm, sterile
532.084S	Saw Blade, parallel, 47.1/25 × 12 × 4.0 mm, cut 90°, shortening 4.0 mm, sterile
532.085S	Saw Blade, parallel, 47.1/25 × 12 × 5.0 mm, cut 90°, shortening 5.0 mm, sterile

Optional instrument

399.082	Reduction Forceps, toothed, soft lock, length 146 mm
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The following features are etched on the parallel saw blade:

- 1 90° transverse cut
- 2 Amount of shortening (mm)
- 3 Effective saw blade distance



Choose an appropriate parallel saw blade for transverse osteotomy (90°) and intended amount of shortening. Be sure that the parallel saw blade and the drill template are intended for the same amount of shortening. Before starting the osteotomy, ensure that the parallel saw blade spacer is in the correct position, away from the coupling part.

Precautions:

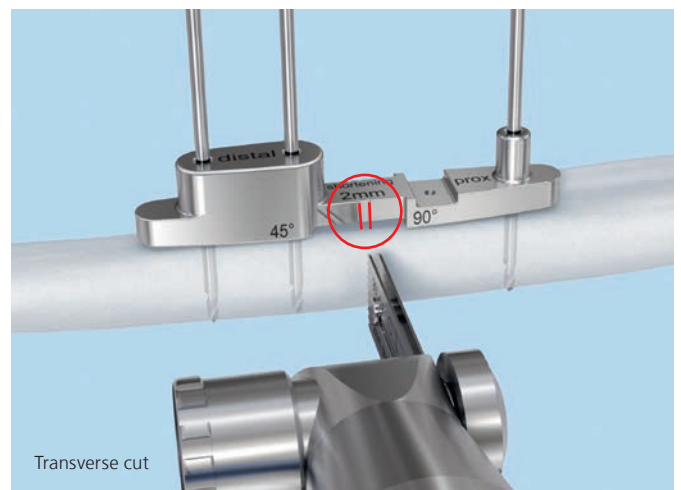
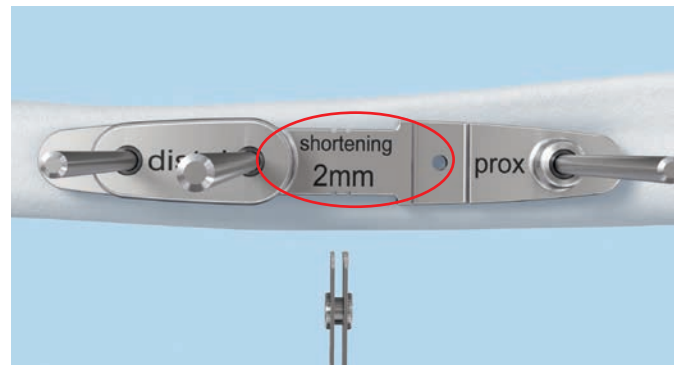
- Protect the soft tissue behind the far cortex.
- Avoid applying excessive force while making the osteotomy cut.
- Always irrigate during sawing to avoid excessive heating. During use, excessive heating can lead to thermal necrosis of the bone or soft tissue burns.
- Make sure that the cut is always perpendicular to the long axis of the bone.

Align the parallel saw blade with the transverse parallel markings on the drill template and perform the osteotomy cut. The markings on the drill template indicate the correct positioning of the saw blade.

Perform the osteotomy with the drill template in contact with the bone and the parallel saw blade in motion. Do not shift the direction of the saw blade once cut has been started. Once cutting has been started, advancement of the saw blade may be easier when the drill template is slid away from the bone by 2-3 mm.

To avoid shifting of the drill template due to vibration, it may be provisionally fixed with reduction forceps.

Note: Before starting the osteotomy, ensure that the spacer of the parallel saw blade is in the correct position, away from the coupling part.

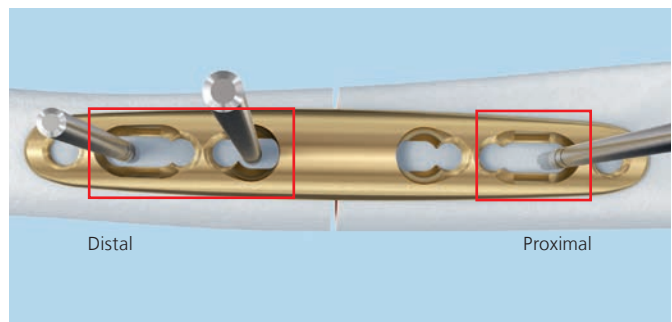
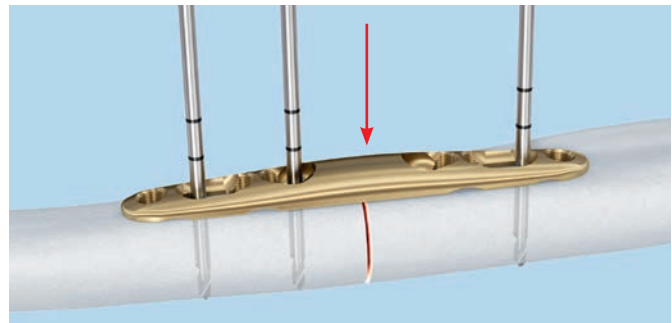
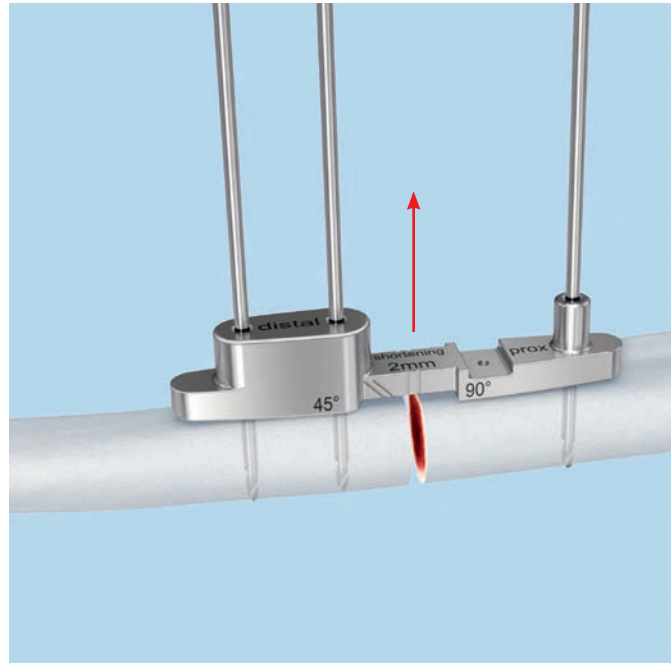


2

Remove drill template and place plate

Remove the drill template. Place the plate over Kirschner wires with most proximal and distal wires sitting within the dynamic compression unit (DCU) of the combi-holes. Reduction of the osteotomy can be achieved by ulnar abduction of the wrist joint or by using a reduction clamp.

Note: If using the compression/distraction instrument, turn spindle clockwise, either by hand or with T8 Stardrive screwdriver, to reduce the osteotomy. Keep Compression/distraction instrument in place to hold reduction. Distraction might be helpful to check for bone residues that could impede complete closure of the gap.



3

Fix plate with cortex and locking screws

Note:

- In young patients with dense cortical bone, screw insertion might be difficult. To make screw insertion easier, the screw can be turned counterclockwise once or twice and reinserted again.
 - Alternatively, a tap prior to screw insertion can be used. Two different taps are available: a tap for cortex screws \varnothing 2.7 mm (311.260) and a tap for locking screws \varnothing 2.7 mm (03.111.906). To differentiate the two taps, laser markings and a color-coded band are indicated on the tap for locking screws.
 - It is recommended to use the tap manually. As a general rule, the tap is turned twice clockwise and once counterclockwise to allow bone debris to collect in the flutes.
 - When inserting a screw in a pretapped hole, use care during insertion and do not apply off-axis load.
-



Tap for Cortex Screws \varnothing 2.7 mm (311.260)



Tap for Locking Screws \varnothing 2.7 mm (03.111.906)

3a**Insert cortex screws****Instruments**

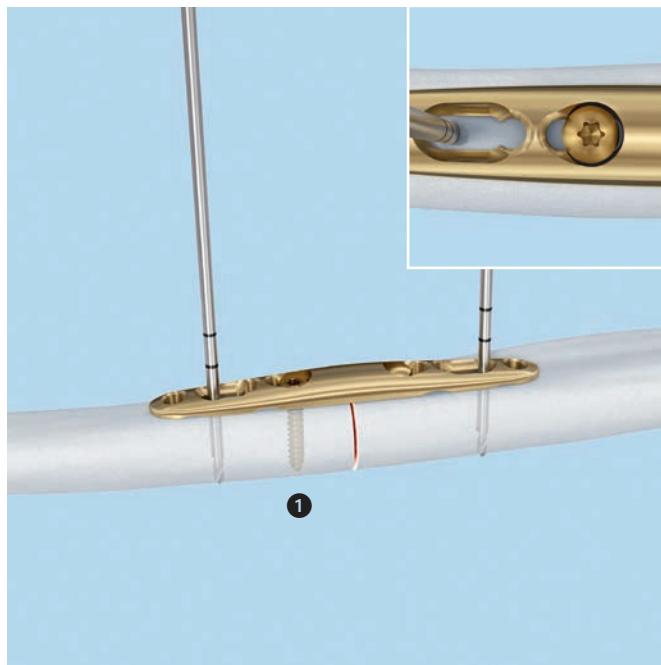
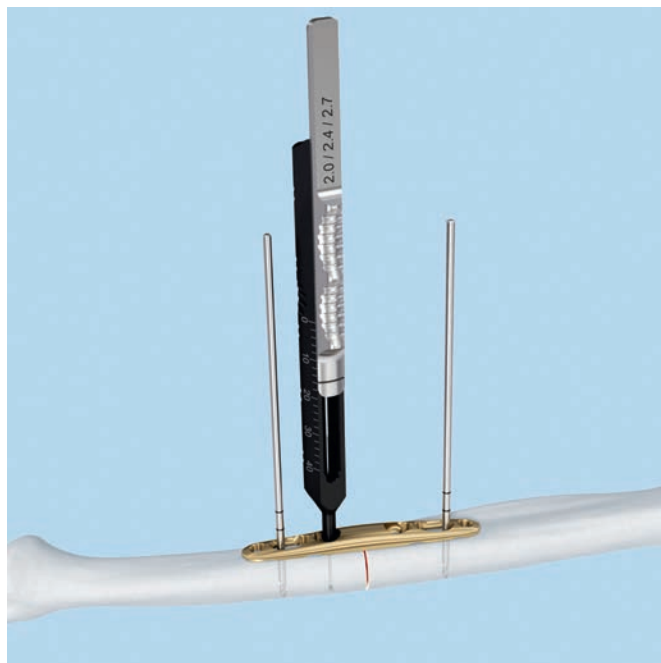
314.467	Screwdriver Shaft, Stardrive, T8, self-holding
03.111.038	Handle with Quick Coupling
03.111.005	Depth Gauge for Screws \varnothing 2.0 to 2.7 mm, measuring range up to 40 mm
399.087	Holding Forceps with Ball, soft lock, length 156 mm

Optional instruments

314.453	Screwdriver Shaft Stardrive 2.4, short, self-holding, for Quick Coupling
311.260	Tap for Cortex Screws \varnothing 2.7 mm, length 100/33 mm
399.082	Reduction Forceps, toothed, soft lock, length 146 mm

Remove the Kirschner wire located distal to the osteotomy. Measure screw length and insert the correct length \varnothing 2.7 mm cortex screw using the self-holding T8 Stardrive screwdriver shaft and the quick coupling handle **1**.

Note: Make sure that the screw does not engage the threaded part of the screw hole. It must be tightened in neutral position in the non-threaded part of the screw hole.



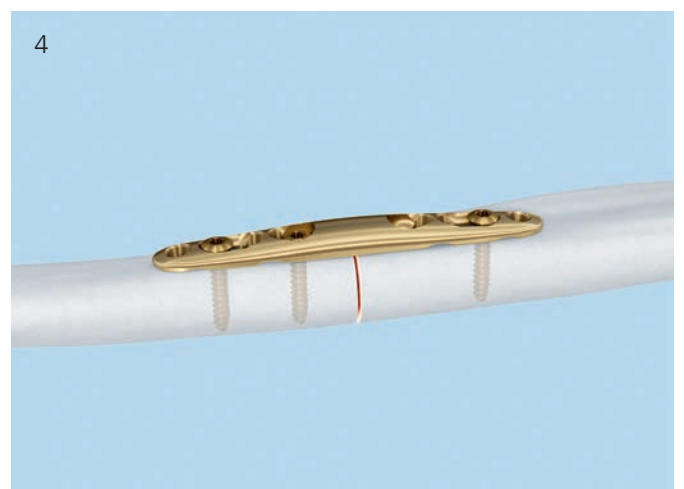
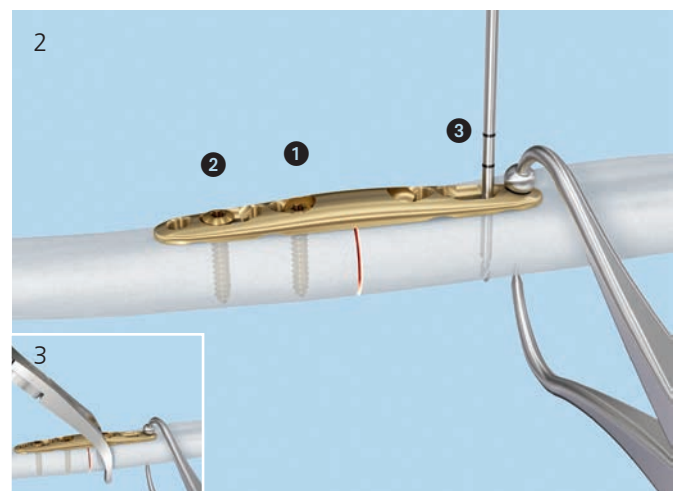
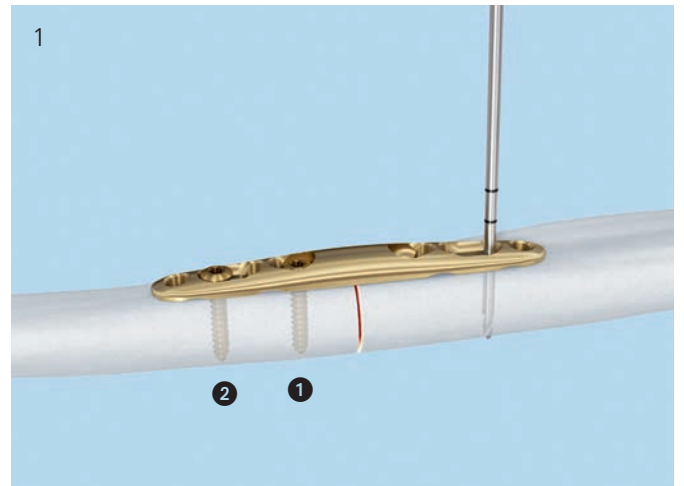
Remove the most distal Kirschner wire, measure the screw length and insert the correct length \varnothing 2.7 mm cortex screw ② (1).

Before removing the proximal Kirschner wire, fix the plate in position with the holding forceps with ball. Place the forceps in the most proximal plate hole (2).

To additionally secure axial alignment of the two fragments, reduction forceps can be used (e.g. 399.082) (3). Remove the Kirschner wire proximal to the osteotomy ③, measure the screw length and insert the correct length \varnothing 2.7 mm cortex screw (4). Remove the holding forceps with ball when tightening the screw and apply compression to the osteotomy.

Notes:

- The screw hole for the third cortex screw (proximal to the osteotomy) is located in eccentric position of the oblong combi-hole. Tightening of this screw will apply compression to the osteotomy.
- Make sure that the osteotomy gap is completely closed.
- In especially hard ulnar bone, the use of a tap may be necessary.
- Consider using a tap in case of very hard ulnar bone
- Insertion of the eccentric screw may be facilitated by loosening the distal cortex screws slightly.



3b

Insert locking screws

Instruments

323.033	LCP Drill Sleeve for LCP Screws \varnothing 2.7 mm (head LCP 2.4), with Scale up to 30 mm, for Drill Bits \varnothing 2.0 mm
310.534	Drill Bit \varnothing 2.0 mm, with marking, length 110/85 mm, 2-flute, for Quick Coupling
03.111.005	Depth Gauge for Screws \varnothing 2.0 to 2.7 mm, measuring range up to 40 mm
314.467	Screwdriver Shaft, Stardrive, T8, self-holding
03.111.038	Handle with Quick Coupling

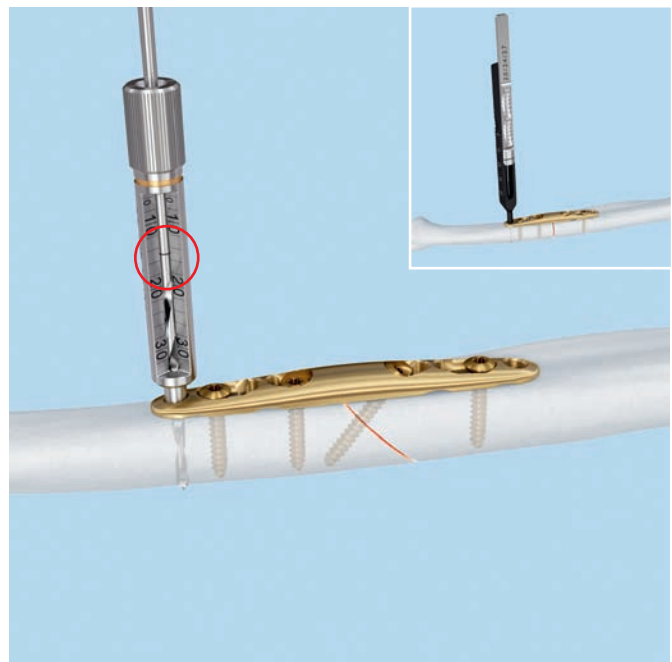
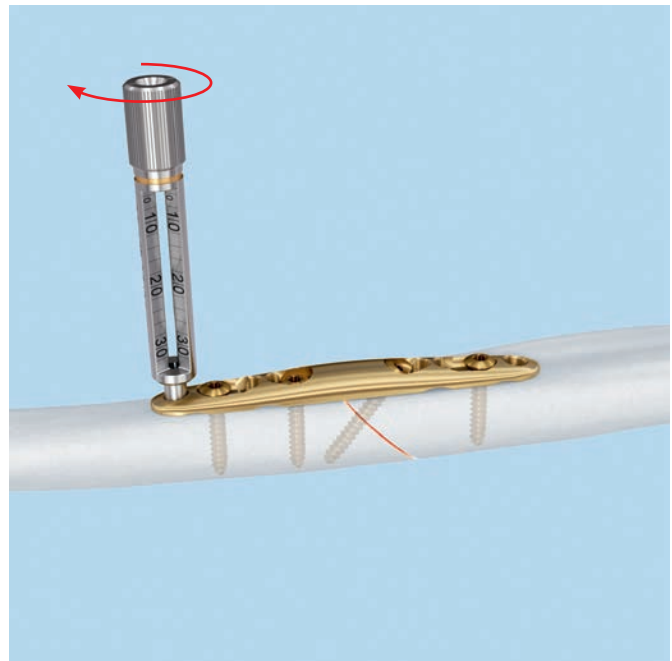
Optional instruments

03.111.906	Tap for Locking Screws \varnothing 2.7 mm, length 100/33 mm
314.453	Screwdriver Shaft Stardrive 2.4, short, self-holding, for Quick Coupling

Screw the LCP drill sleeve into the most distal locking hole until fully seated.

Use the \varnothing 2.0 mm drill bit to drill to the desired depth.

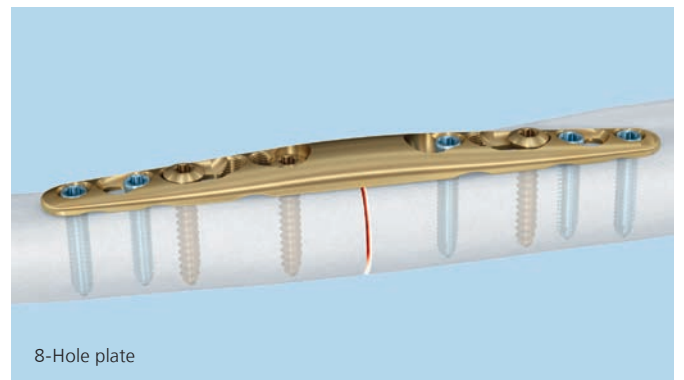
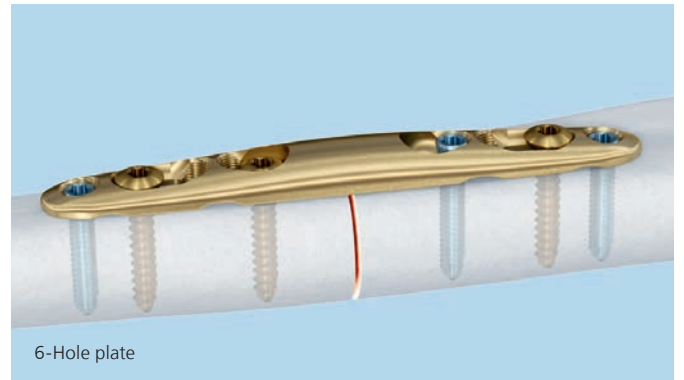
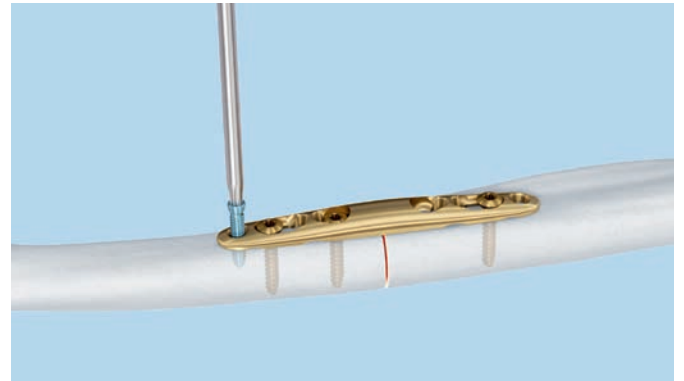
Measure the screw length either by using the scale on the drill bit or by using the depth gauge.



Insert the correct length locking screw manually with the self-holding T8 Stardrive screwdriver shaft and quick coupling handle.

Note: Do not yet fully tighten the screw to lock. For the locking of locking screws, see page 30.

Insert additional locking screws as planned. If additional fixation is needed, the elongated hole may be filled with two screws.



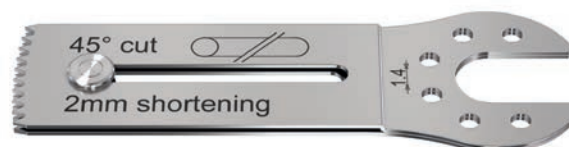
B Oblique Osteotomy

1

Perform oblique osteotomy

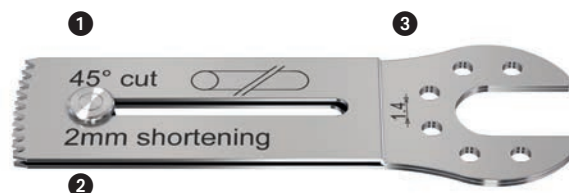
Instruments for oblique osteotomy cut

532.091S	Saw Blade, parallel, 47.1/25×12×1.4 mm, cut 45°, shortening 2.0 mm, sterile
532.092S	Saw Blade, parallel, 47.1/25×12×1.8 mm, cut 45°, shortening 2.5 mm, sterile
532.093S	Saw Blade, parallel, 47.1/25×12×2.1 mm, cut 45°, shortening 3.0 mm, sterile
532.094S	Saw Blade, parallel, 47.1/25×12×2.8 mm, cut 45°, shortening 4.0 mm, sterile
532.095S	Saw Blade, parallel, 47.1/25×12×3.5 mm, cut 45°, shortening 5.0 mm, sterile



Optional instruments

399.082	Reduction Forceps, toothed, soft lock, length 146 mm
03.111.905	Saw Guide for LCP Ulna Osteotomy Plate 2.7
511.776	Torque limiter, 0.8 Nm, with AO/ASIF Quick Coupling
314.467	Screwdriver Shaft, Stardrive, T8, self-holding
03.110.005	Handle for Torque Limiters 0.4/0.8/1.2 Nm



The following features are etched on the parallel saw blade:

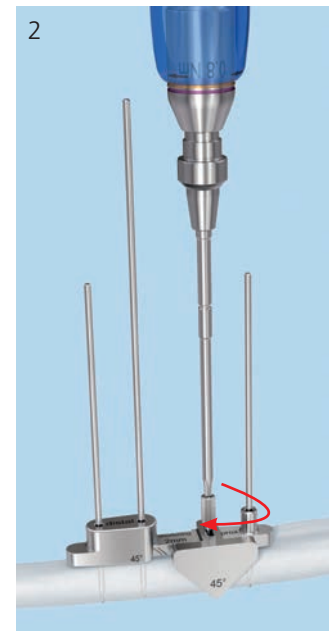
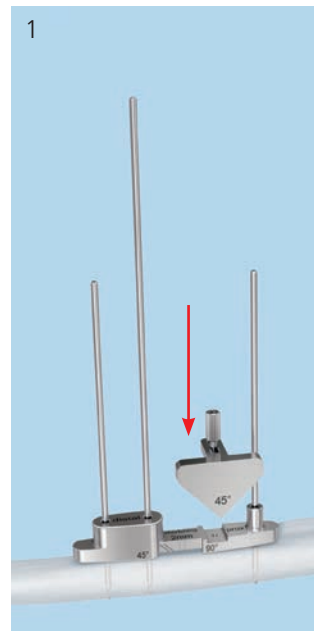
- ① 45° oblique cut
- ② Amount of shortening (mm)
- ③ Effective saw blade distance

Choose an appropriate parallel saw blade for oblique osteotomy (45°) and intended amount of shortening. Be sure that the parallel saw blade and the drill template are intended for the same amount of shortening. Before starting the osteotomy, ensure that the parallel saw blade spacer is in the correct position, away from the coupling part.

Precautions:

- Protect the soft tissue behind the far cortex.
- Avoid applying excessive force while making the osteotomy cut.
- Always irrigate during sawing to avoid excessive heating. During use excessive heating can lead to thermal necrosis of the bone or soft tissue burns.
- Make sure that the cut is always perpendicular to the long axis of the bone.
- To indicate the correct angle for the 45° oblique cut, a saw guide can be mounted on the drill template (1).

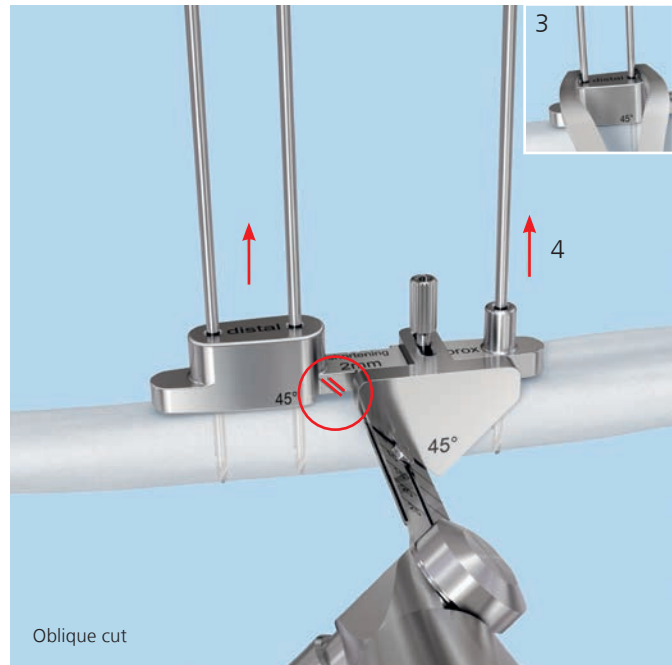
In this case use the screwdriver together with the 0.8 Nm Torque Limiter to tighten the screw (2). To untighten the screw, use the screwdriver only without the torque limiter.



Align the parallel saw blade with the oblique parallel markings on the drill template and perform the osteotomy cut. The markings on the drill template indicate the correct positioning of the saw blade.

Perform the osteotomy with the drill template in contact with the bone and the parallel saw blade in motion. Do not shift the direction of the saw blade once cutting has been started. Once cutting has been started, advancement of the saw blade may be easier when the drill template is slid away from the bone by 2–3 mm (4).

Note: To avoid shifting of the drill template due to vibration, it may be provisionally fixed with reduction forceps (3).

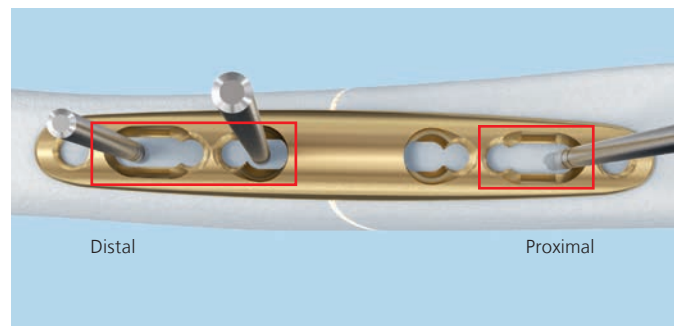
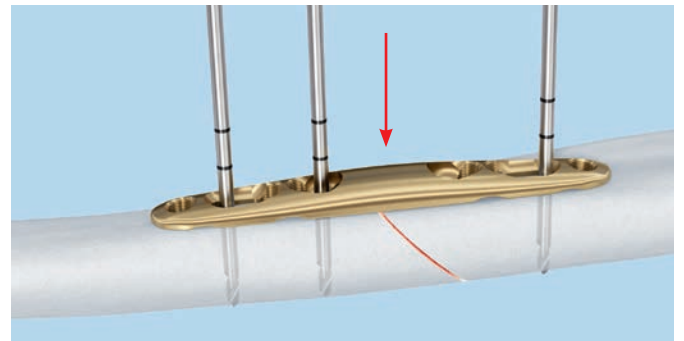


2

Remove drill template and place plate

Remove the drill template. Place the plate over Kirschner wires with most proximal and distal wires sitting within the dynamic compression unit (DCU) of the combi-holes. Reduction of the osteotomy can be achieved by ulnar abduction of the wrist joint or by using a reduction clamp.

Note: If using the compression/distraction instrument, turn spindle clockwise, either by hand or with T8 Stardrive screwdriver, to reduce the osteotomy. Keep Compression/distraction instrument in place to hold reduction. Distraction might be helpful to check for bone residues that could impede complete closure of the gap.



3

Fix plate with cortex and locking screws

Note:

- In young patients with dense cortical bone, screw insertion might be difficult. To make screw insertion easier, the screw can be turned counterclockwise once or twice and reinserted again.
 - Alternatively, a tap prior to screw insertion can be used. Two different taps are available: a tap for cortex screws Ø 2.7 mm (311.260) and a tap for locking screws Ø 2.7 mm (03.111.906).
 - To differentiate the two taps, laser markings and a color-coded band are indicated on the tap for locking screws.
 - It is recommended to use the tap manually. As a general rule, the tap is turned twice clockwise and once counterclockwise to allow bone debris to collect in the flutes.
 - When inserting a screw in a pretapped hole, use care during insertion and do not apply off-axis load.
-



Tap for Cortex Screws Ø 2.7 mm (311.260)



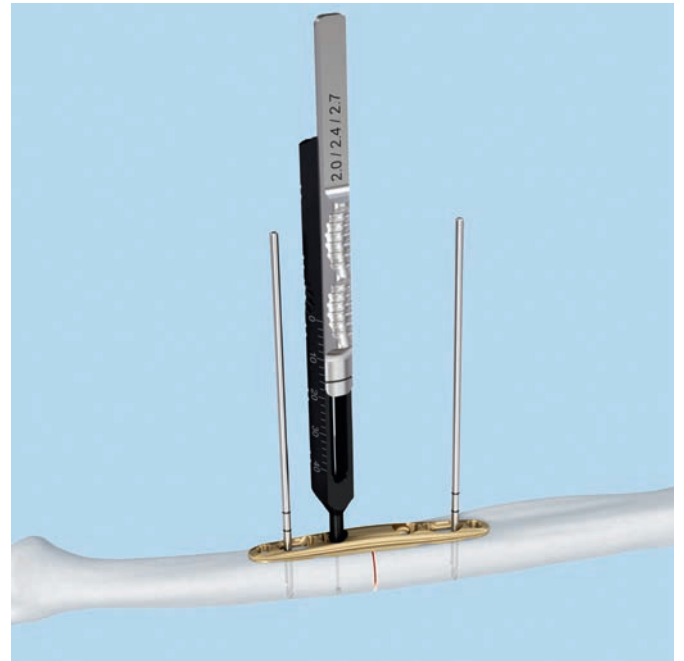
Tap for Locking Screws Ø 2.7 mm (03.111.906)

3a

Insert cortex screws

Instruments

314.467	Screwdriver Shaft, Stardrive, T8, self-holding
03.111.038	Handle with Quick Coupling
03.111.005	Depth Gauge for Screws Ø 2.0 to 2.7 mm, measuring range up to 40 mm
399.087	Holding Forceps with Ball, soft lock, length 156 mm
312.240	Double Drill Guide 2.7/2.0
310.260	Drill Bit Ø 2.7 mm, length 100/75 mm, 2-flute, for Quick Coupling
310.534	Drill Bit Ø 2.0 mm, with marking, length 110/85 mm, 2-flute, for Quick Coupling

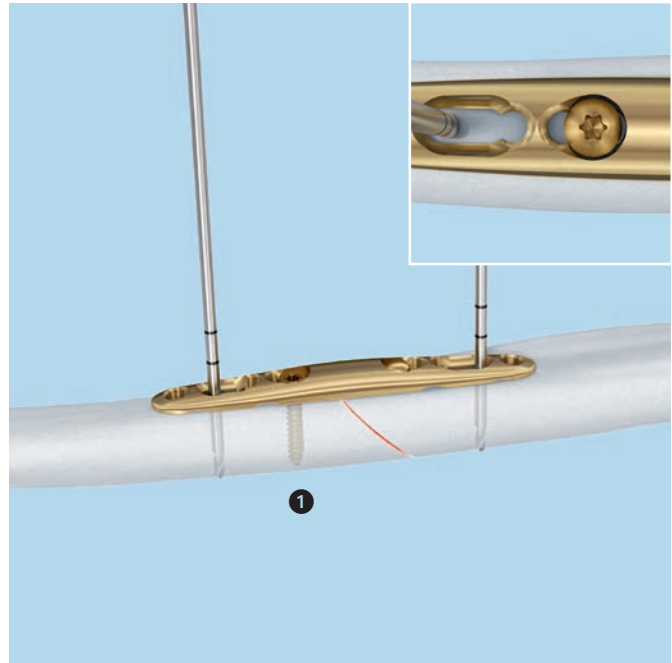


Optional instruments

314.453	Screwdriver Shaft Stardrive 2.4, short, self-holding, for Quick Coupling
323.260	Universal Drill Guide 2.7
311.260	Tap for Cortex Screws Ø 2.7 mm, length 100/33 mm
399.082	Reduction Forceps, toothed, soft lock, length 146 mm

Remove the Kirschner wire located distal to the osteotomy. Measure the screw length and insert the correct length Ø 2.7 mm cortex screw using the self-holding T8 Stardrive screwdriver shaft and the quick coupling handle ①.

Note: Make sure that the screw does not engage the threaded part of the screw hole. It must be tightened in neutral position in the non-threaded part of the screw hole.



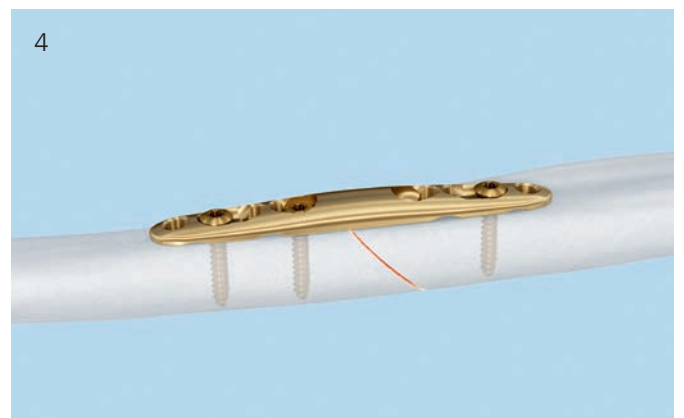
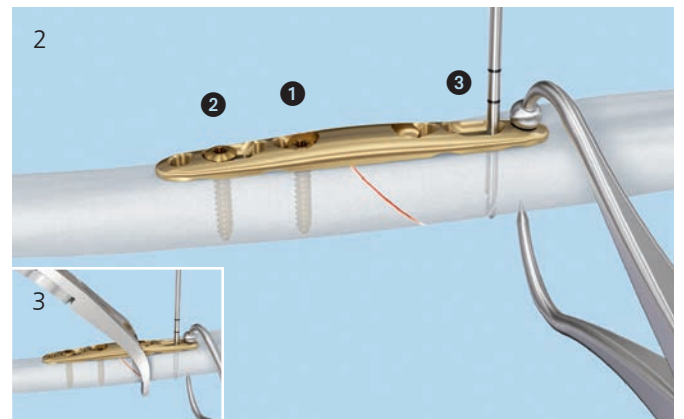
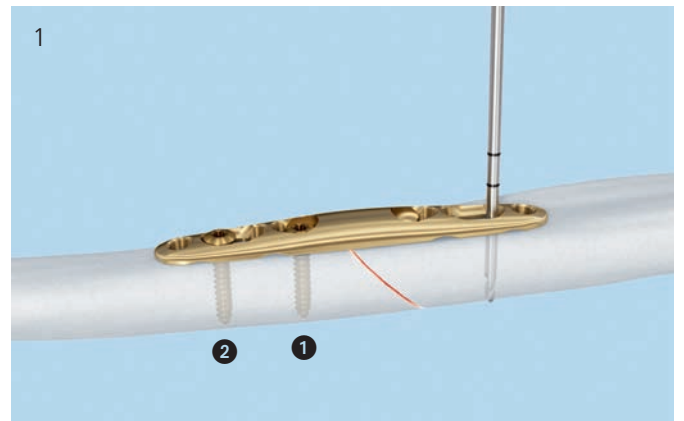
Remove the most distal Kirschner wire, measure the screw length and insert the correct length \varnothing 2.7 mm cortex screw ② (1).

Before removing the proximal Kirschner wire, fix the plate in position with the holding forceps with ball. Place the forceps in the most proximal plate hole (2).

To additionally secure axial alignment of the two fragments, reduction forceps can be used (e.g. 399.082) (3). Remove the Kirschner wire proximal to the osteotomy ③, measure the screw length and insert the correct length \varnothing 2.7 mm cortex screw (4). Remove the holding forceps with ball when tightening the screw and apply compression to the osteotomy.

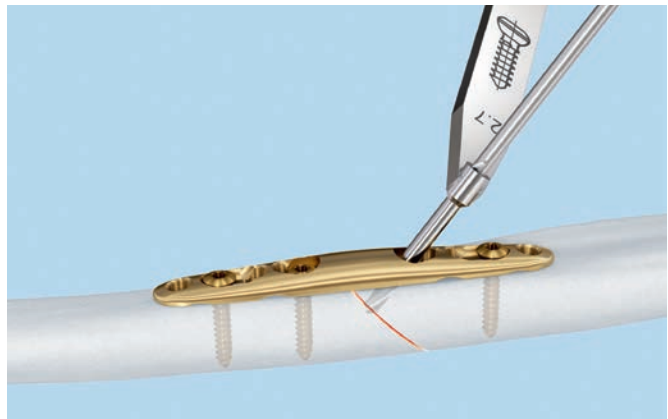
Notes:

- The screw hole for the third cortex screw (proximal to the osteotomy) is located in eccentric position of the oblong combi-hole. Tightening of this screw will apply compression to the osteotomy.
- Make sure that the osteotomy gap is completely closed.
- In especially hard ulnar bone, the use of a tap may be necessary.
- Consider using a tap in case of very hard ulnar bone
- Insertion of the eccentric screw may be facilitated by loosening the distal cortex screws slightly.

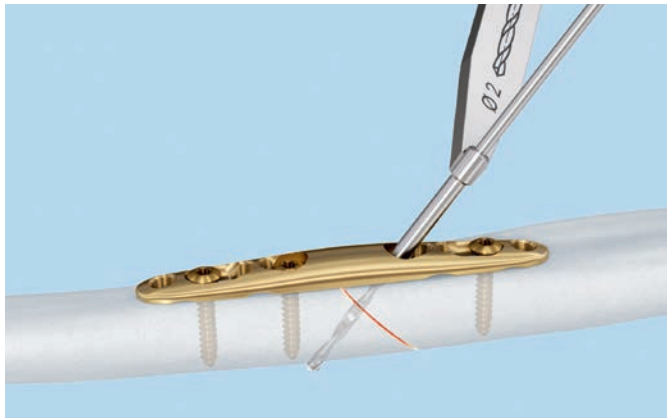


If a lag screw is desired, use the following technique:

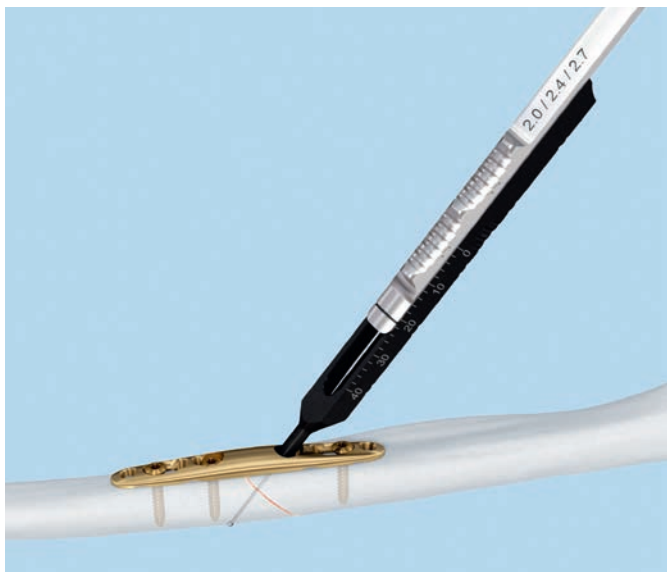
Overdrill the near cortex using the double drill guide 2.7 and the drill bit \varnothing 2.7 mm.



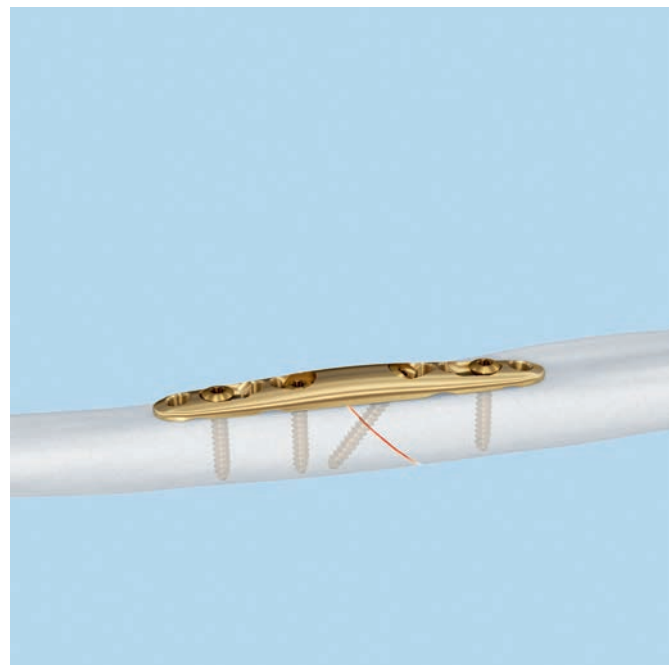
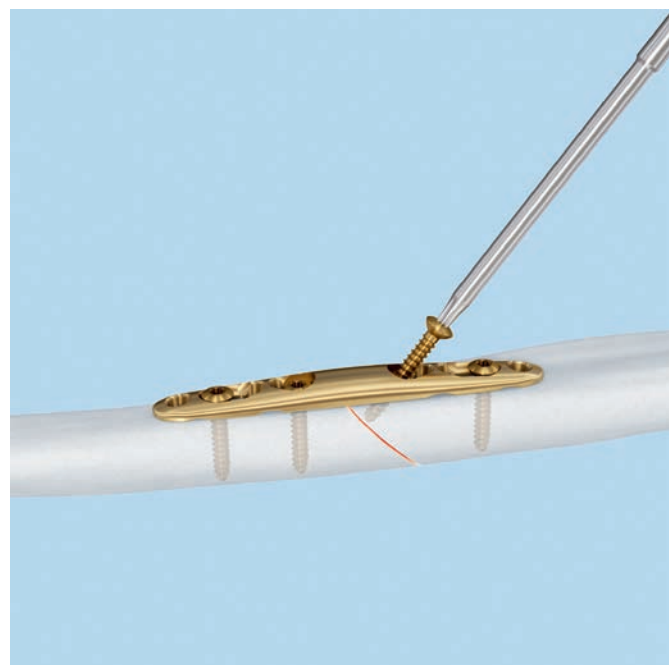
Drill the threaded hole using the double drill guide 2.0 and the drill bit \varnothing 2.0 mm.



Measure the screw length using the depth gauge.



Select and insert the correct length \varnothing 2.7 mm cortex screw as a lag screw using the T8 screwdriver shaft and the handle with quick coupling.



3b**Insert locking screws****Instruments**

323.033	LCP Drill Sleeve for LCP Screws \varnothing 2.7 mm (head LCP 2.4), with Scale up to 30 mm, for Drill Bits \varnothing 2.0 mm
310.534	Drill Bit \varnothing 2.0 mm, with marking, length 110/85 mm, 2-flute, for Quick Coupling
03.111.005	Depth Gauge for Screws \varnothing 2.0 to 2.7 mm, measuring range up to 40 mm
314.467	Screwdriver Shaft, Stardrive, T8, self-holding
03.111.038	Handle with Quick Coupling

Optional instruments

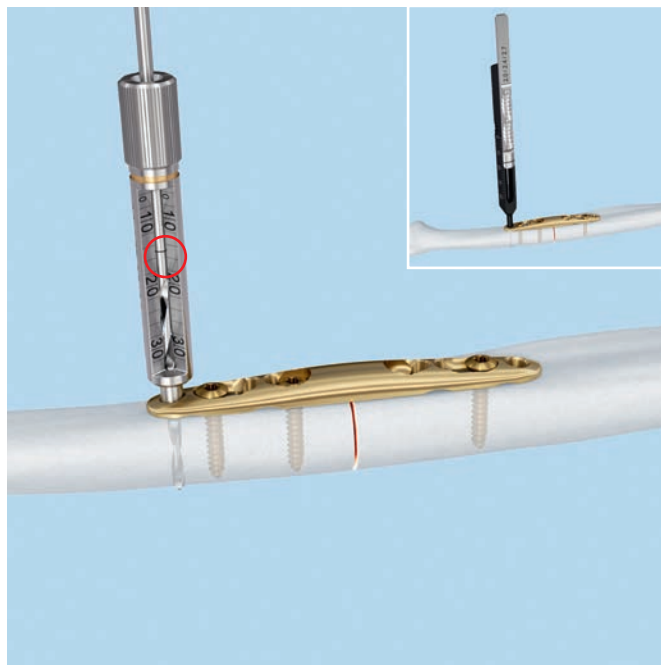
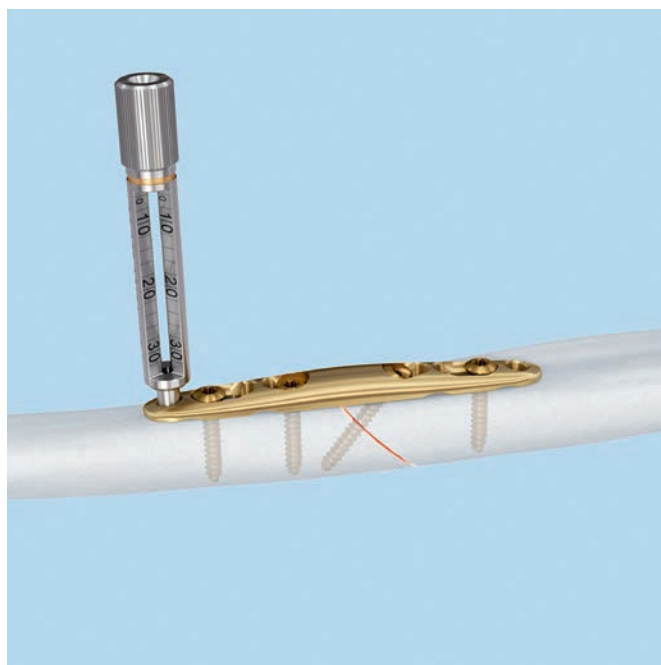
03.111.906	Tap for Locking Screws \varnothing 2.7 mm, length 100/33 mm
314.453	Screwdriver Shaft Stardrive 2.4, short, self-holding, for Quick Coupling

Screw the LCP drill sleeve into the most distal locking hole until fully seated.

Use the 2.0 mm \varnothing drill bit to drill to the desired depth.

Note: In especially hard ulnar one, the use of a tap (03.111.906) may be necessary.

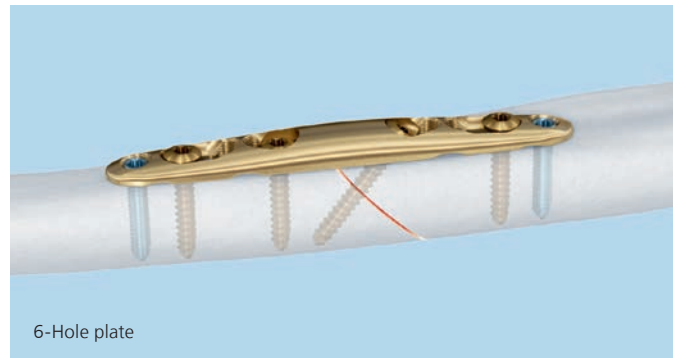
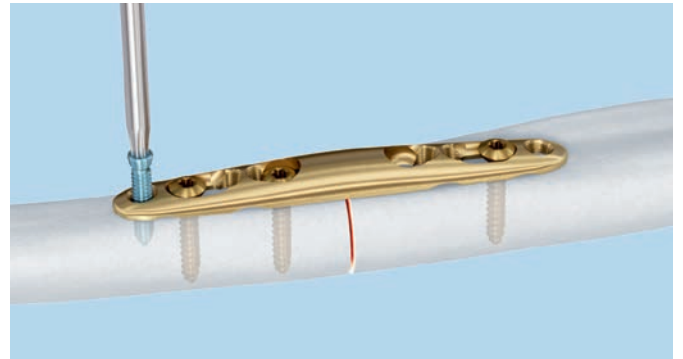
Measure the screw length either by using the scale on the drill bit or by using the depth gauge.



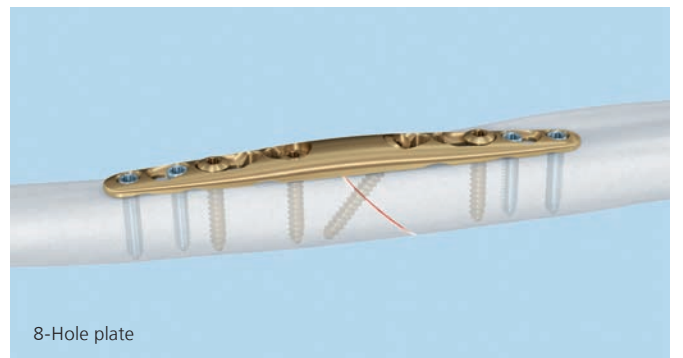
Insert the correct length locking screw manually with the self-holding T8 Stardrive screwdriver shaft and quick coupling handle.

Note: Do not yet fully tighten the screw to lock.
For the locking of locking screws, see the following page.

Insert additional locking screws as planned. If additional fixation is needed, the elongated hole may be filled with two screws.



6-Hole plate



8-Hole plate

Final Fixation of Locking Screws

Perform final fixation of locking screws

Instruments

03.110.005	Handle for Torque Limiters 0.4/0.8/1.2 Nm
511.776	Torque Limiter, 0.8 Nm, with AO Quick Coupling
314.453	Screwdriver Shaft Stardrive 2.4, short, self-holding, for Quick Coupling

Optional instrument

314.467	Screwdriver Shaft, Stardrive, T8, self-holding
---------	------------------------------------------------

Use the 0.8 Nm torque limiter to perform the final locking step for locking screws.

The torque limiter prevents overtightening and ensures that the locking screws are securely locked into the plate.

Assemble the torque limiter and the handle for torque limiter and tighten the locking screws using the self-holding T8 Stardrive screwdriver shaft.

Note: When performing the final locking step, the Torque Limiter should always be used.

If the torque limiter releases prior to final locking, the use of a tap is recommended (see technique tips on pages 13 and 22, respectively).



Alternative Technique

Use of compression/distraction instrument

Instruments

03.111.907	Compression/Distraction Instrument
02.111.902.01	Kirschner Wire Ø 2.0 mm with drill tip, length 100 mm, Stainless Steel
02.111.903.01	Kirschner Wire Ø 2.0 mm with drill tip, length 150 mm, Stainless Steel

If additional stabilization is desired, apply the compression/distraction instrument prior to performing the osteotomy cut.

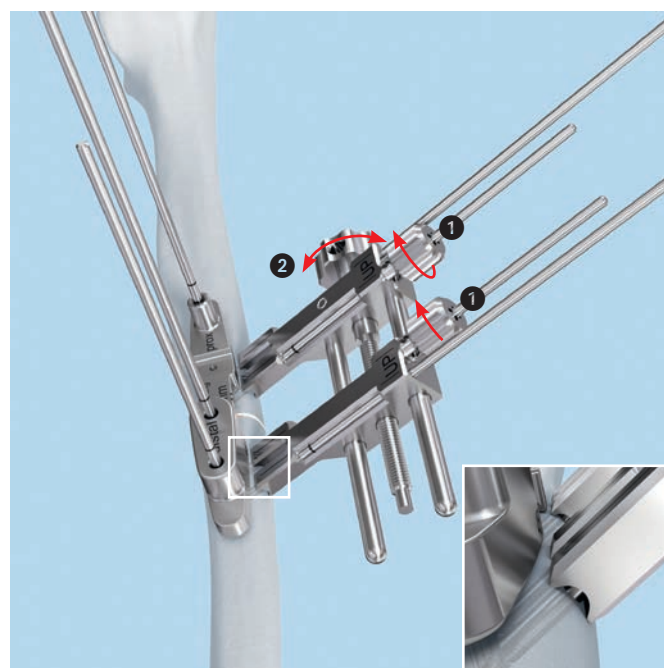
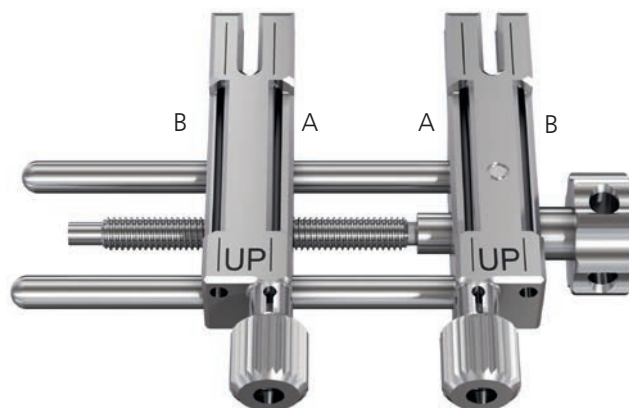
Note:

- Before using the compression/distraction instrument, ensure that the screw nuts are loosened.
- Be sure that the Kirschner wires used for fixation of the compression/distraction instrument do not collide with the wires used for fixation of the drill template.

Position and fix the compression/distraction instrument with the 100 mm Ø 2.0 mm Kirschner wires (02.111.902.01) in the inner part of the clamps (A). Tighten the nuts clockwise to retain the Kirschner wires ①. For additional fragment support and rotational control, insert the 150 mm Ø 2.0 mm Kirschner wires (02.111.903.01) in the outer part of the clamps (B).

Notes:

- Both tips of the compression/distraction instrument should be in contact with the bone.
- Adjust the position of the clamps to allow for adequate working space by turning the spindle ②.

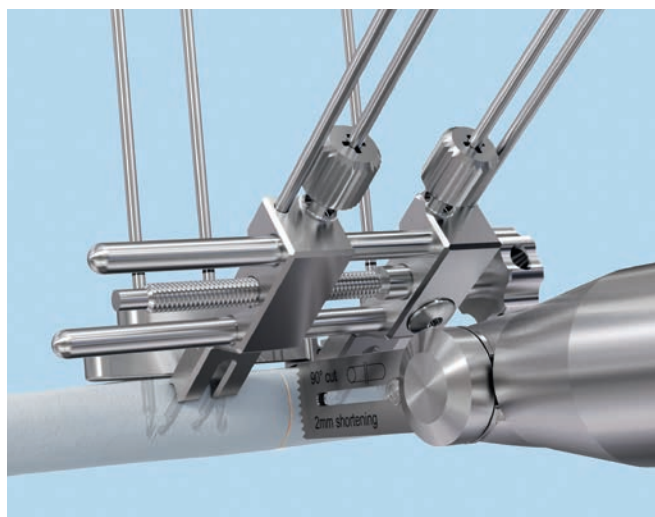
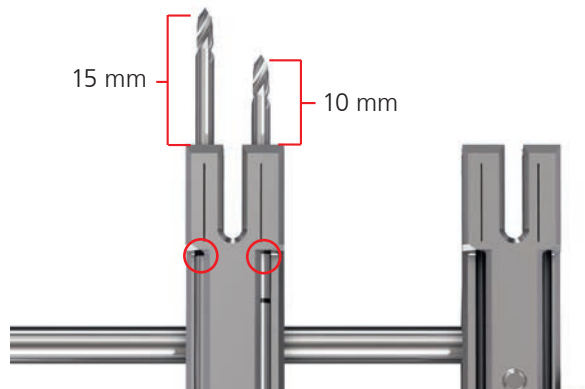


For an oblique cut, it might be necessary to remove the saw guide to apply the compression/distraction instrument. The cut can be marked before the compression/distraction instrument is applied.

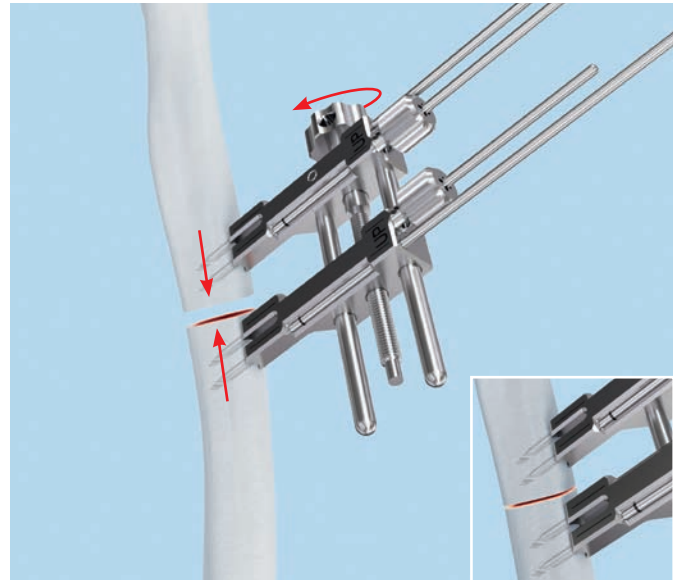
The circular laser markings on the Kirschner wires can be used as approximate indication for insertion depth: the first marking indicates insertion depth 10 mm, the second marking 15 mm (reading at the cut-out edge of the compression/distraction instrument).

Perform the osteotomy cut. If more workspace is needed, the compression/distraction instrument can be positioned further away from the bone. For proper alignment, check exact position prior to moving the compression/distraction instrument.

After removal of the drill template, distract/reduce the bone ends by turning the knob on the spindle. Distraction might be helpful to check for bone residues that could impede complete closure of the gap.



Freehand application: The compression/distraction instrument can also be used freehand (without the use of the drill template) and for osteotomy cuts larger than 5 mm.



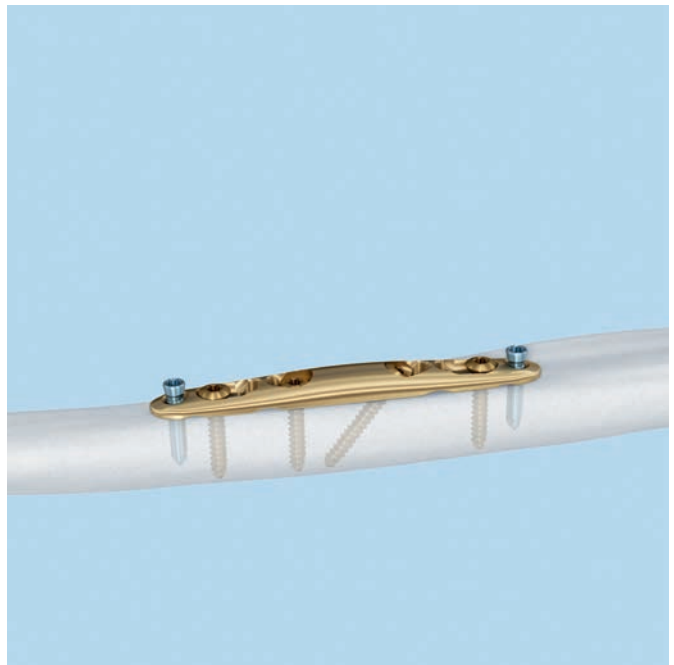
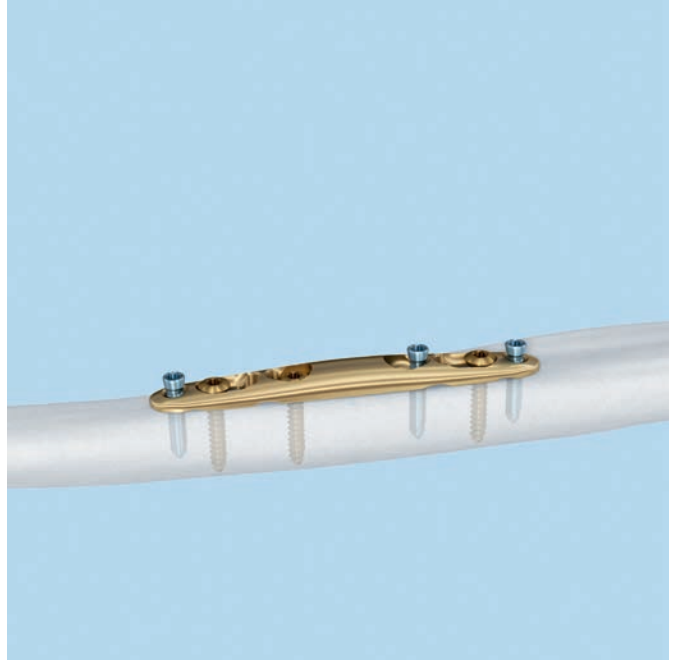
Implant Removal

Instruments

03.111.038	Handle with Quick Coupling
314.467	Screwdriver Shaft, Stardrive, T8, self-holding

To remove locking screws, first unlock all screws from the plate; then remove the screws completely from the bone.

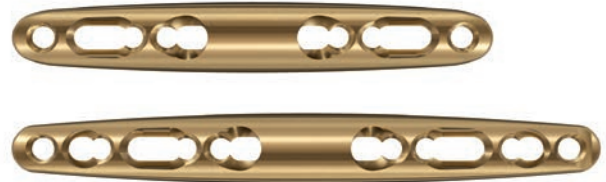
The last screw removed should be a non-locking screw on the shaft. This guarantees that the plate does not spin when the locking screws are removed.



Implants

LCP Ulna Osteotomy Plate 2.7

Stainless steel	Titanium	Holes	Length (mm)
02.111.900	04.111.900	6	62
02.111.901	04.111.901	8	76



Cortex Screw Stardrive, Ø 2.7 mm, self-tapping

Stainless steel	Titanium	Length (mm)
202.868	402.868	8
202.870	402.870	10
202.872	402.872	12
202.874	402.874	14
202.876	402.876	16
202.878	402.878	18
202.880	402.880	20
202.882	402.882	22
202.884	402.884	24
202.886	402.886	26
202.888	402.888	28
202.890	402.890	30



Locking Screw Stardrive, Ø 2.7 mm (head LCP 2.4), self-tapping

Stainless steel	Titanium	Length (mm)
202.208	402.208	8
202.210	402.210	10
202.211	402.211	11
202.212	402.212	12
202.213	402.213	13
202.214	402.214	14
202.216	402.216	16
202.218	402.218	18
202.220	402.220	20
202.222	402.222	22
202.224	402.224	24



All implants are also available sterile packed. Add suffix «S» to article number.

Drill templates for LCP Ulna Osteotomy Plate

Art. No.	Shortening distance
03.111.900	2.0 mm
03.111.901	2.5 mm
03.111.902	3.0 mm
03.111.903	4.0 mm
03.111.904	5.0 mm



Kirschner wire with drill tip*

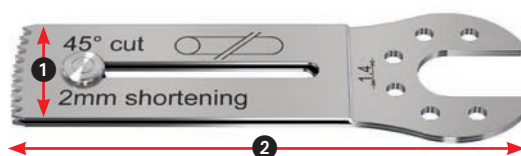
02.111.902.01	Kirschner Wire \varnothing 2.0 mm with drill tip, length 100 mm, Stainless Steel
02.111.903.01	Kirschner Wire \varnothing 2.0 mm with drill tip, length 150 mm, Stainless Steel



* To order sterile packed Kirschner wires with drill tip, add suffix "S" to article number. Pack of 10 units: 02.111.902.10 / 02.11.903.10

Parallel saw blades for LCP Ulna Osteotomy Plate

Art. No.	Osteotomy angle	Shortening distance
532.081S	Transverse (90°)	2.0 mm
532.082S	Transverse (90°)	2.5 mm
532.083S	Transverse (90°)	3.0 mm
532.084S	Transverse (90°)	4.0 mm
532.085S	Transverse (90°)	5.0 mm
532.091S	Oblique (45°)	2.0 mm
532.092S	Oblique (45°)	2.5 mm
532.093S	Oblique (45°)	3.0 mm
532.094S	Oblique (45°)	4.0 mm
532.095S	Oblique (45°)	5.0 mm



- ① Width: 12 mm
- ② Length: 47.1 mm
Usable length: 25 mm

Standard instruments

03.111.038 Handle with Quick Coupling



03.110.005 Handle for Torque Limiters 0.4/0.8/1.2 Nm



511.776 Torque Limiter, 0.8 Nm, with AO/ASIF Quick Coupling



314.453 Screwdriver Shaft Stardrive 2.4, short, self-holding, for Quick Coupling



03.111.005 Depth Gauge for Screws \varnothing 2.0 to 2.7 mm, measuring range up to 40 mm



314.467 Screwdriver Shaft, Stardrive, T8, self-holding



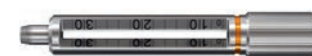
310.534 Drill Bit \varnothing 2.0 mm, with marking, length 110/85 mm, 2-flute, for Quick Coupling



310.260 Drill Bit \varnothing 2.7 mm, length 100/75 mm, 2-flute, for Quick Coupling



323.033 LCP Drill Sleeve for LCP Screws \varnothing 2.7 mm (head LCP 2.4), with Scale up to 30 mm, for Drill Bits \varnothing 2.0 mm



312.240 Double Drill Guide 2.7/2.0



311.260 Tap for Cortex Screws \varnothing 2.7 mm, length 100/33 mm



03.111.906 Tap for Locking Screws \varnothing 2.7 mm, length 100/33 mm



399.087 Holding Forceps with Ball, soft lock, length 156 mm

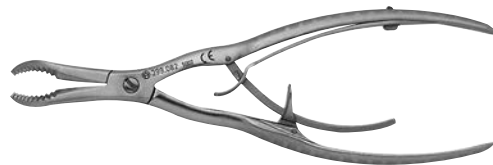


323.260 Universal Drill Guide 2.7



Optional instruments

399.082 Reduction Forceps, toothed, soft lock, length 146 mm



399.071 Reduction Forceps with Points, soft lock, length 126 mm



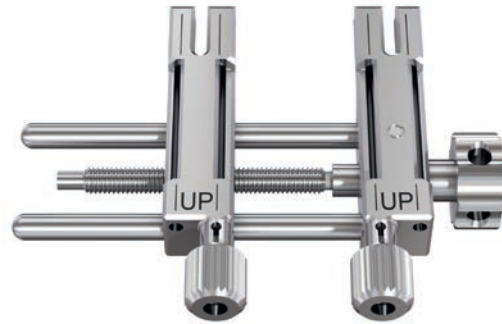
314.468 Holding Sleeve for Screws Stardrive
Ø 2.4 mm, T8, for Screwdriver Shafts
Ø 3.5 mm, for No. 314.467



03.111.905 Saw Guide for LCP Ulna Osteotomy
Plate 2.7



03.111.907 Compression/Distraction Instrument



Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-06e1 and ASTM F 2119-07

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 F 2182-11a

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 thermoregulation 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.
-

