ChM®

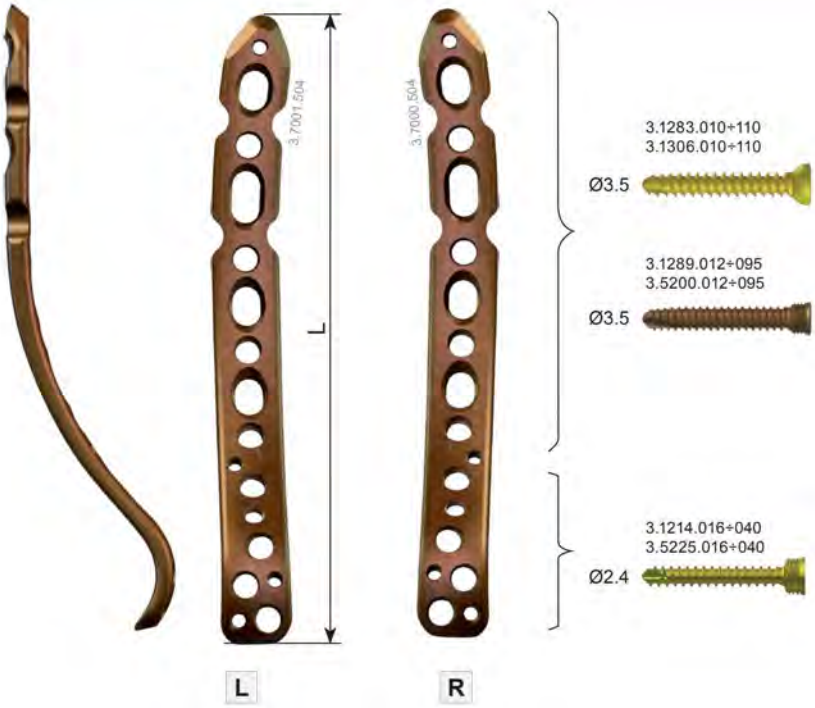
Surgical technique

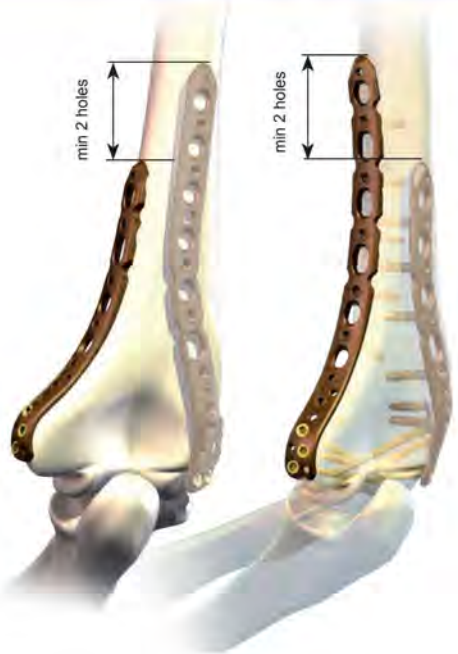
5,0 ChM Locked Plating ChLP system

5.0ChLP distal medial humerus plate

O	L [mm]	Catalogue no. Left	Catalogue no. Right
3	89	3.7001.503	3.7000.503
4	107	3.7001.504	3.7000.504
5	121	3.7001.505	3.7000.505
6	136	3.7001.506	3.7000.506

O – threaded holes number in shaft part of the plate





Palette for 5.0ChLP plates - 3.7000-3.7003

No.	Catalogue no.	Name	Pcs		
1	40.5729.100	Aiming block L **[3.7003]**	1	40.5758.110	40.5758.610
2	40.5729.200	Aiming block R **[3.7002]**	1		
3	40.5728.100	Aiming block L **[3.7001]**	1		
4	40.5728.200	Aiming block R **[3.7000]**	1		
5	40.5672.000	Protective guide 7.0/5.0	2		
6	40.5758.310	Palette	1		
7	12.0751.100	Container solid bottom 1/2 306x272x85 mm	1		
8	12.0751.200	Perforated aluminum lid 1/2 306x272x55 mm Gray	1		

implants not included; with additional instruments

ChM sp. z o.o., Lewickie 3b, 16-061 Juchnowiec Kościelny, POLAND, tel. + 48 85 713 13 20, fax + 48 85 713 13 19, chm@chm.eu, www.chm.eu

Indications

- Inner and periarticular fractures of the distal end of the humeral bone.
- Fractures of the distal end of the humeral bone extending to the shaft.
- Corrective osteotomy.
- Non-union of fractured bone.

Contraindications

Absolute:

- Health condition precluding surgery.
- Allergic reactions to the metal from which the implant is made.
- Active infection.

Relative:

- Significant weakening of the bone *(by disease, infection or prior implantation)* making it impossible to install/stabilize the implant properly.
- Abnormal perfusion of fracture area or surgical site.
- Excessive obesity.
- Lack of adequate tissue coverage.
- Psychiatric disorders or the disorders of the musculoskeletal system which may create a risk of fusion failure or complications in the postoperative period.
- Other medical conditions that exclude the potential benefits of the treatment.

The patient's position

Lateral lying position

Lying on the back position

Lying on the stomach position

Surgical approach

The approach is dependent on the fracture type

Lateral approach

Medial approach

Posterior approach

Particular attention should be paid to the ulnar nerve - it is essential to expose it.
Lateral, medial or both approaches simultaneously may be implemented.
Posterior approach that bypasses the olecranon makes it possible to conduct the osteotomy of the olecranon which in result allows a better view of the fracture site.

Procedure stages

- Reduction of fracture and stabilization of the fracture fragments with Kirschner wires - particular attention should be paid to the reconstruction of the articular surfaces. Please note that the plates are provided with holes for initial stabilization using Kirschner wires.
- The choice of implants - determining the length and position of the implant.

ATTENTION: In the case of stabilization using two plates, the implants should be of different length as to avoid overloading of the shaft of the humeral bone. Two-holes difference in length is indicated.

- Adjusting the shape of the implant, if necessary.
- Positioning of the plate using the compression screw in the extended hole.
- Temporary stabilization of the implant using Kirschner wires.
- Introduction of the screws in the distal parts of the plate.

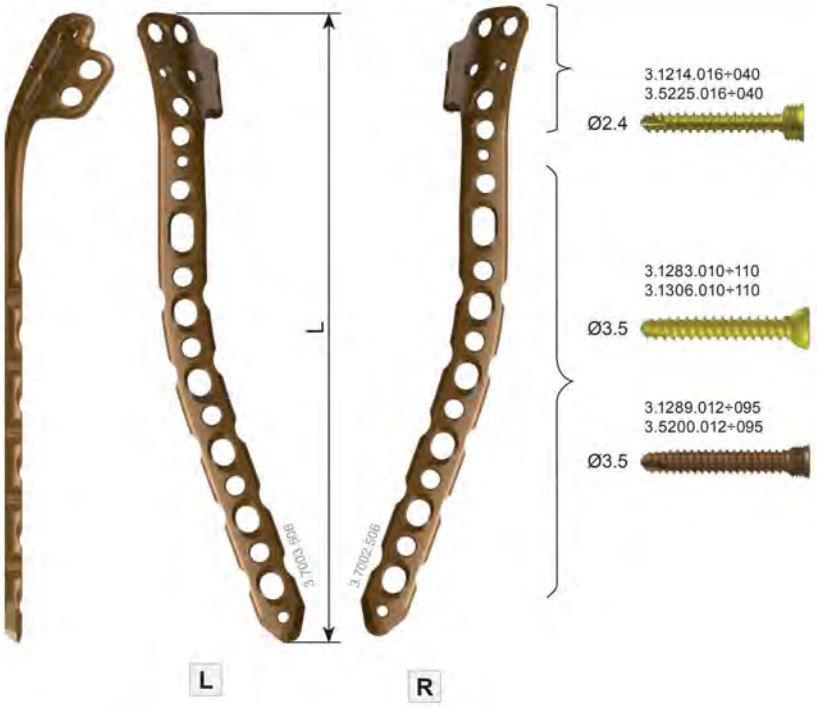
ATTENTION: When inserting the screws in the distal parts of the plate make sure they do not move into the articular surfaces or olecranon fossae.

- Stabilization of the shaft using locking or compression screws.

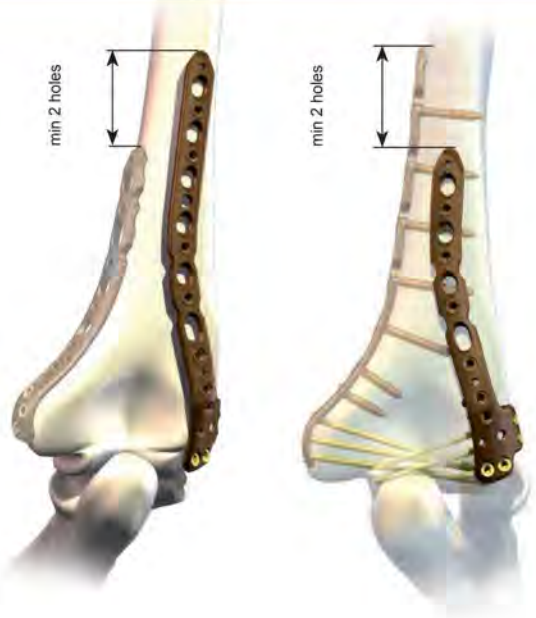
5.0ChLP distal dorso-lateral humerus plate

O	L [mm]	Catalogue no. Left	Catalogue no. Right
3	95	3.7003.503	3.7002.503
4	109	3.7003.504	3.7002.504
5	123	3.7003.505	3.7002.505
6	137	3.7003.506	3.7002.506

O – threaded holes number in shaft part of the plate



Palette for 5.0ChLP plates - 3.7000-3.7003



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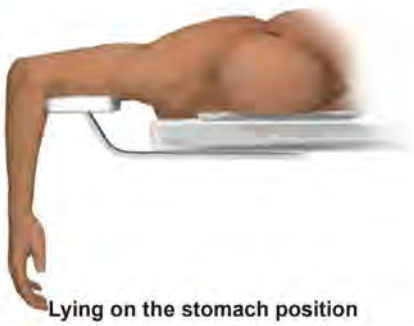
- Abnormal perfusion of fracture area or surgical site.
- Excessive obesity.
- Lack of adequate tissue coverage.
- Psychiatric disorders or the disorders of the musculoskeletal system which may create a risk of fusion failure or complications in the postoperative period.
- Other medical conditions that exclude the potential benefits of the treatment.

The patient's position

Lateral lying position

Lying on the back position



Lying on the stomach position

Surgical approach

The approach is dependent on the fracture type

Lateral approach

Medial approach

Posterior approach

Particular attention should be paid to the ulnar nerve - it is essential to expose it.
Lateral, medial or both approaches simultaneously may be implemented.
Posterior approach that bypasses the olecranon makes it possible to conduct the osteotomy of the olecranon which in result allows a better view of the fracture site.

Procedure stages

- Reduction of fracture and stabilization of the fracture fragments using Kirschner wires - particular attention should be paid to the reconstruction of the articular surfaces. Please note that the plates are provided with holes for initial stabilization using Kirschner wires.
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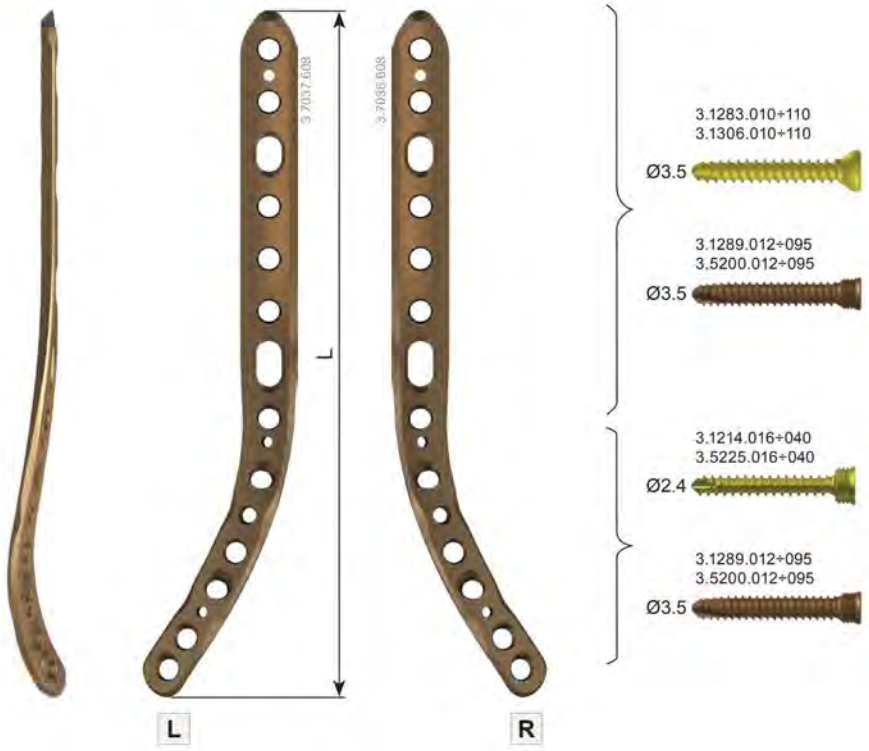
- Introduction of the screws in the distal parts of the plate.
  Attention: When inserting the screws in the distal parts of the plate make sure they do not move into the articular surfaces or olecranon fossae.
- Stabilization of the shaft using locking or compression screws.

5.0ChLP distal lateral humerus plate

O	L [mm]	Catalogue no. Right	Left
4	91	3.7036.604	3.7037.604
6	111	3.7036.606	3.7037.606
8	131	3.7036.608	3.7037.608
10	151	3.7036.610	3.7037.610
12	171	3.7036.612	3.7037.612

O - holes number in shaft part of the plate

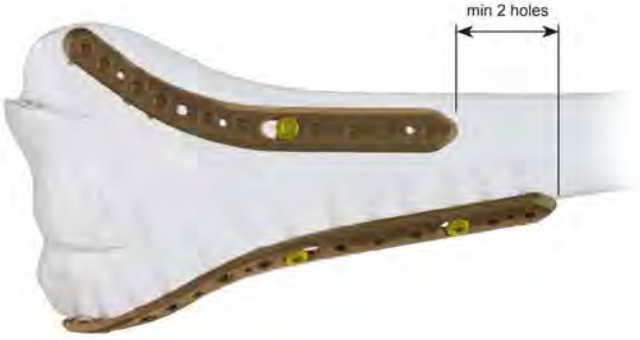


180°

3.7071 / 3.7072 5.0ChLP distal medial humerus plate + **3.7036 / 3.7037** 5.0ChLP distal lateral humerus plate

90°

3.7040 / 3.7041 5.0ChLP distal posterior medial humerus plate + **3.7036 / 3.7037** 5.0ChLP distal lateral humerus plate



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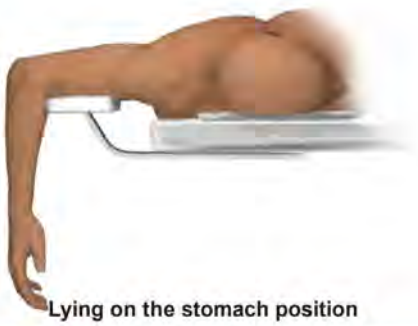
The patient's position

Lateral lying position

Lying on the back position



Lying on the stomach position

Surgical approach

The approach is dependent on the fracture type

Lateral approach

Medial approach

Posterior approach

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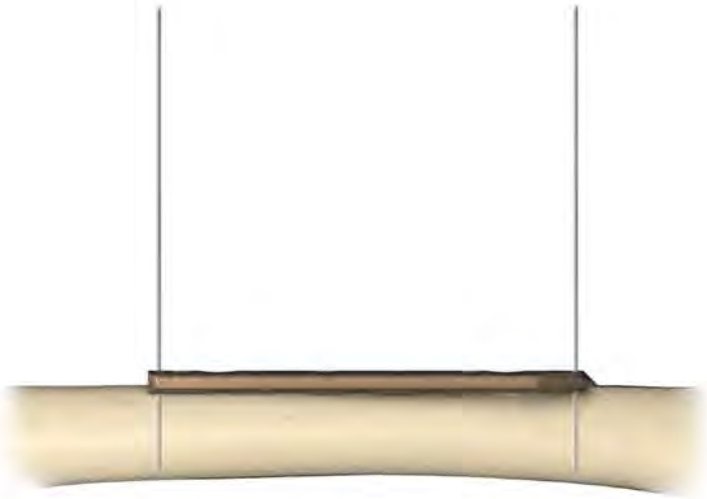
- Stabilization of the shaft using locking or compression screws.

IV. SURGICAL TECHNIQUE

IV.1. TEMPORARY PLATE ATTACHMENT

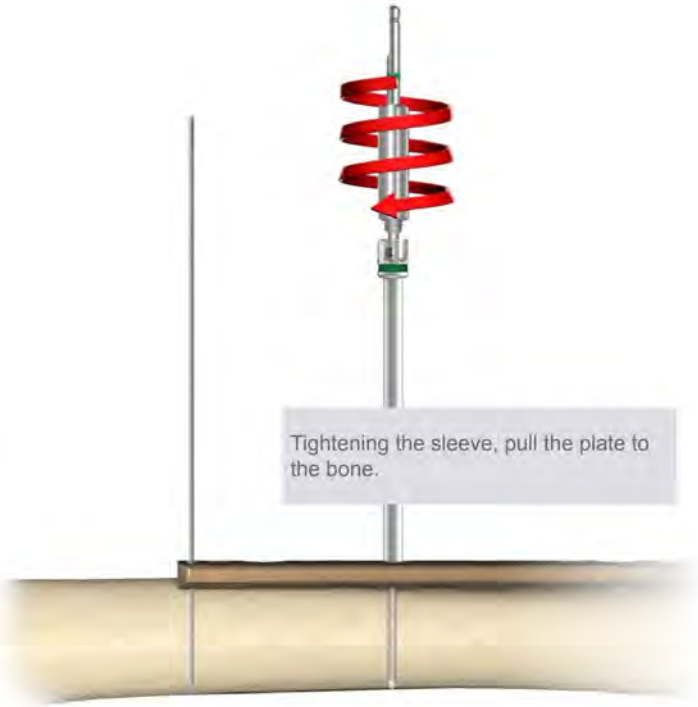
When fracture is reduced and the plate position is confirmed, determine its temporary location using Kirschner wires 2.0 **[40.4815.220]**.
Wires can be inserted in proximal holes of the plate and the most distal ones.



Confirm the plate position is correct taking X-ray image.

NOTE: The Setting-compressing screw 2.8/180 [40.5674.728] can be used to stabilize and tighten the plate up to the bone for temporary purposes. The screw is to be inserted via the Guide sleeve 5.0/2.8 [40.5673.728].

Locking screw Ø3.5 can be inserted in the hole after removal of the Setting-compressing screw 2.8/180.

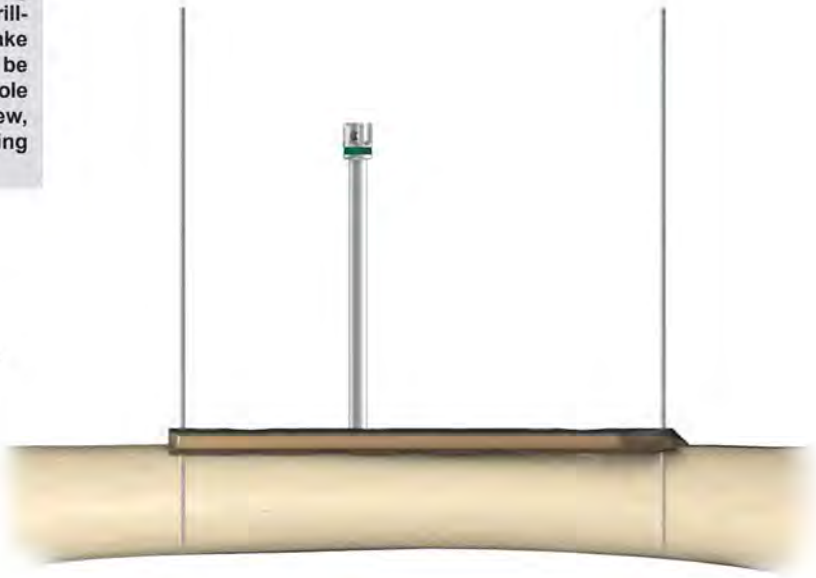


IV.2. LOCKING SCREW Ø3.5 INSERTION

It is important to drill exactly in the axis of a locking hole. Use always the appropriate guide sleeve when drilling. The guide sleeve will ensure the locking screw take an axial position towards the hole of the plate and be correctly locked in the plate. Unprepared drilling of a hole can lead to: thread skewing and jamming the screw, incorrect screw locking and problems when removing the screws *(thread seizure)*.

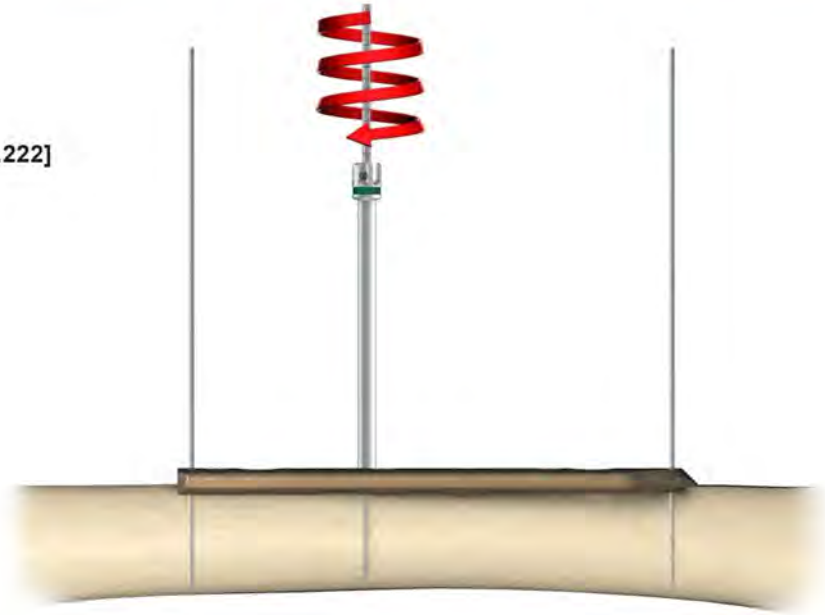
Guide sleeve screwing.

Insert the Guide sleeve 5.0/2.8 **[40.5673.728]** into the plate.



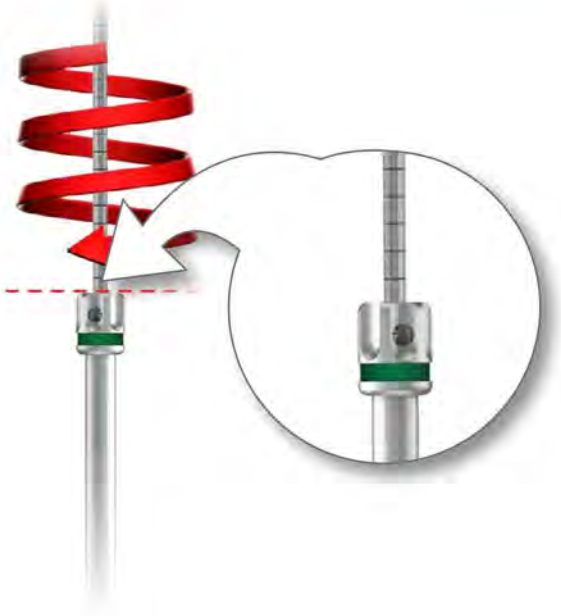
Drilling the hole

Ream the hole using the Drill with scale 2.8/220 **[40.5653.222]** until the desire depth is reached.

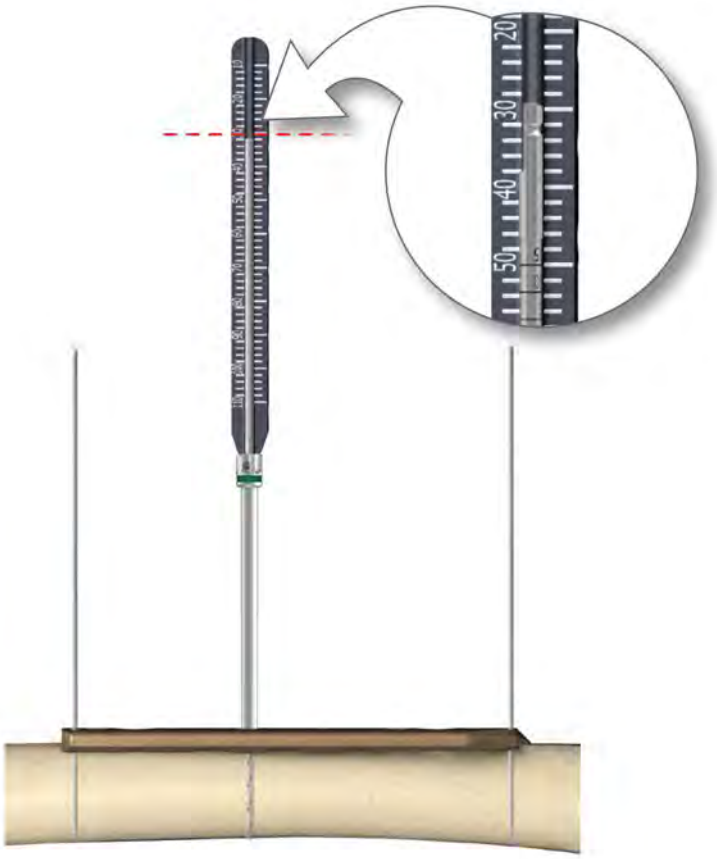


Hole depth measurement

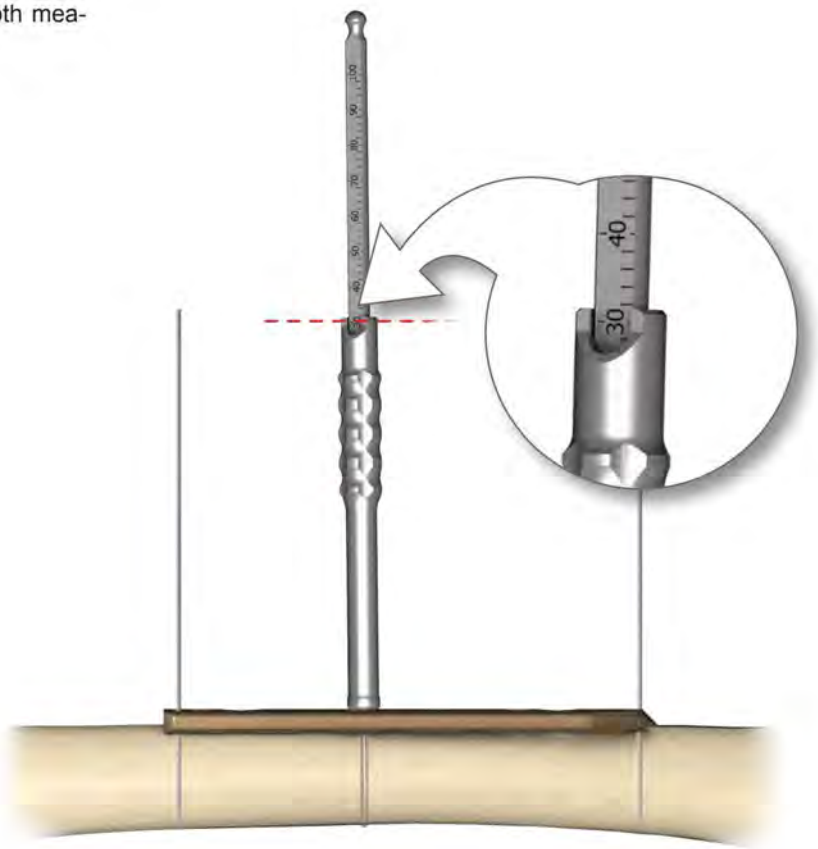
OPTION I: Read the value on the Drill with scale **[40.5653.222]** or



OPTION II: use the Screw length measure **[40.5675.100]**.

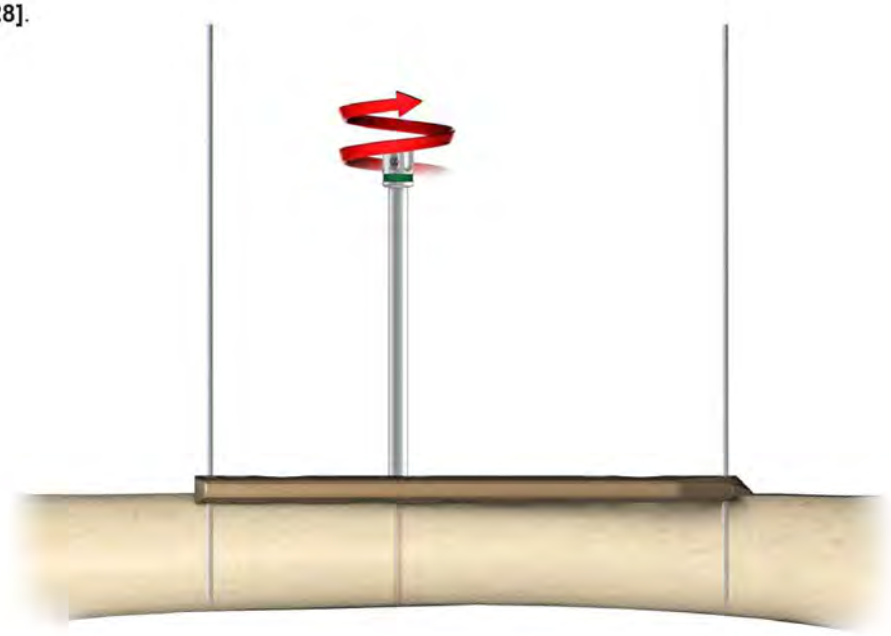


OPTION III: Unscrew the Guide sleeve 5.0/2.8 **[40.5673.728]** and define the screw length using the Depth measure **[40.4639.500]**.

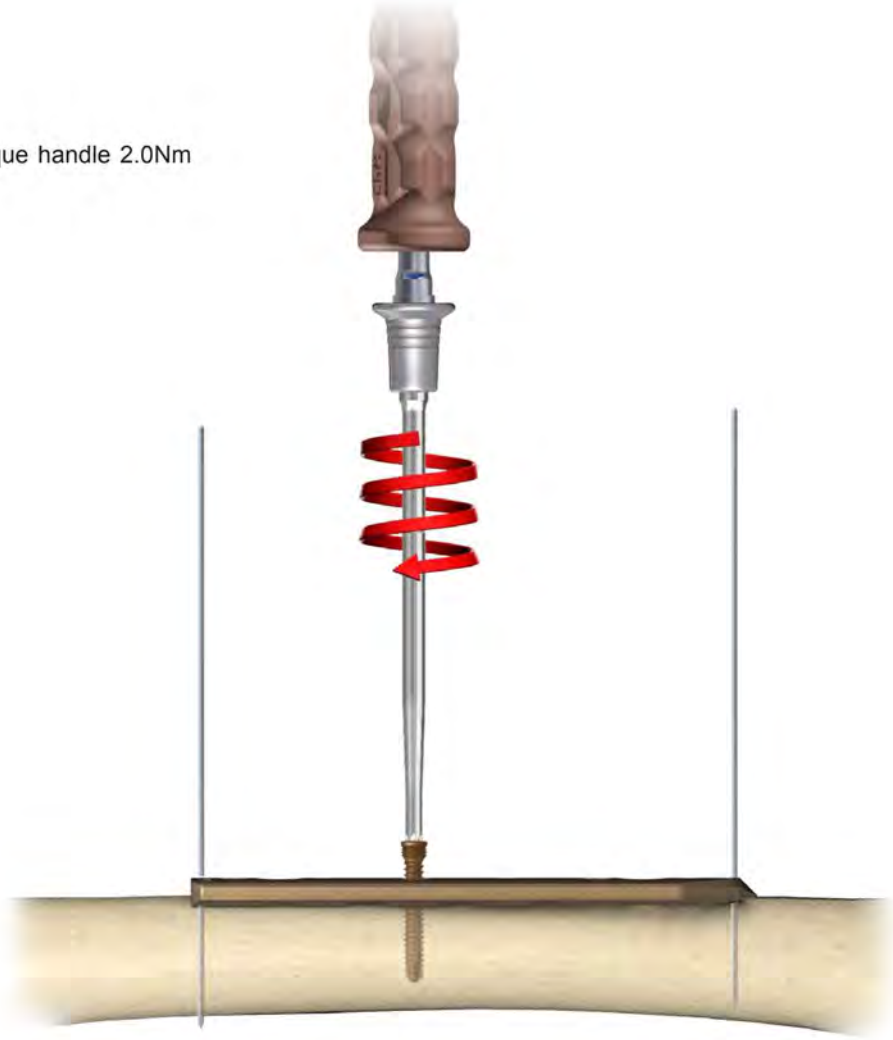


Screw insertion

Remove the Guide sleeve 5.0/2.8 **[40.5673.728]**.



Insert the locking screw Ø3.5 using the Torque handle 2.0Nm **[40.5635]** and proper screwdriver tip.

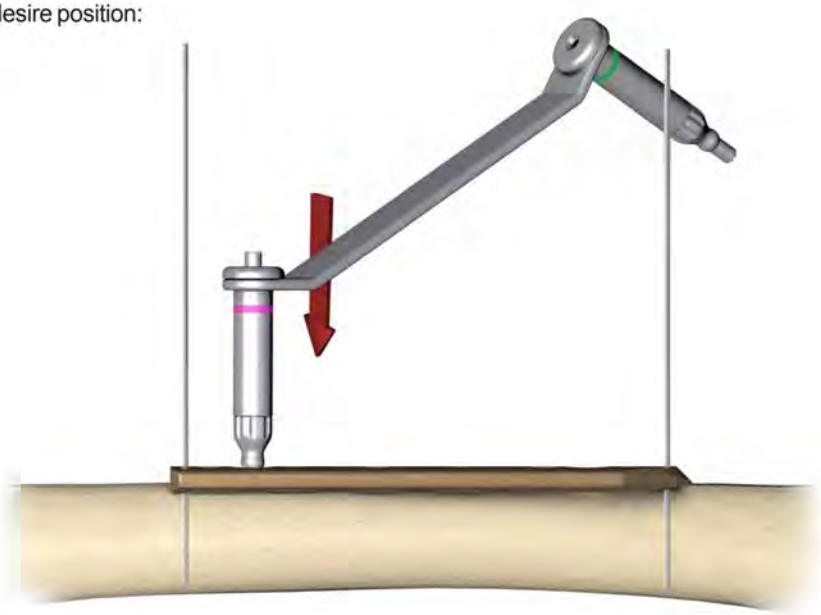


IV.4. CORTICAL SCREW Ø3.5 INSERTION

Compression guide setting
Set the Compression guide 2.5/2.8 **[40.4804.700]** in desire position:

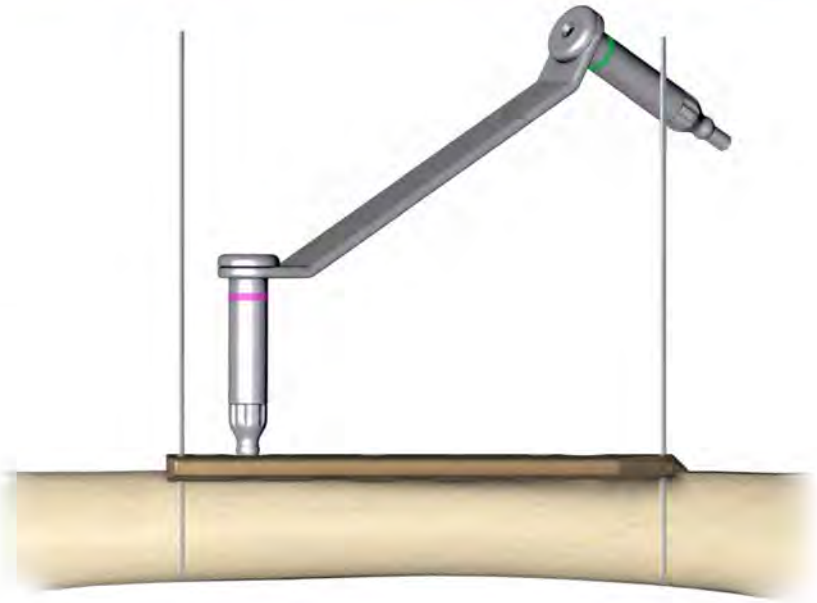
a. Neutral position

Press the guide to the plate to achieve the neutral position for screw insertion.



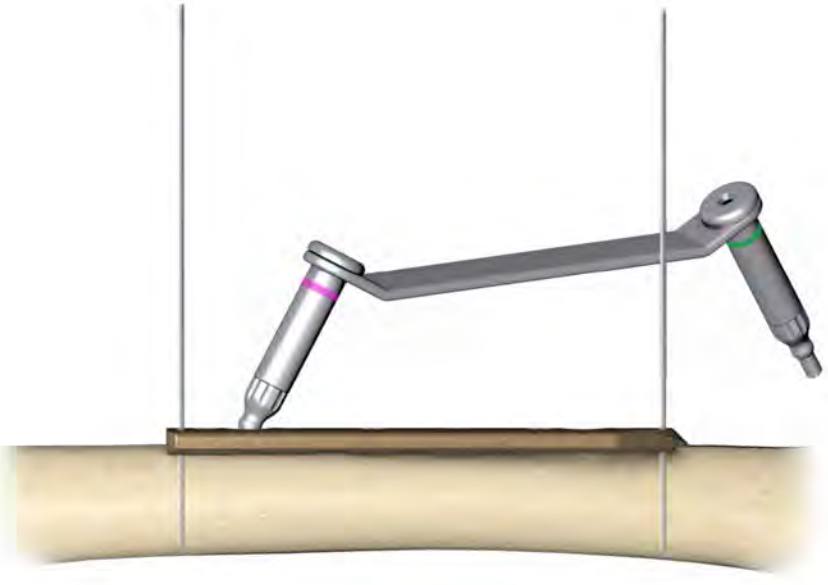
b. Compressive position

Move the guide without pressure to the edge of compression hole to achieve the compression position for screw insertion.



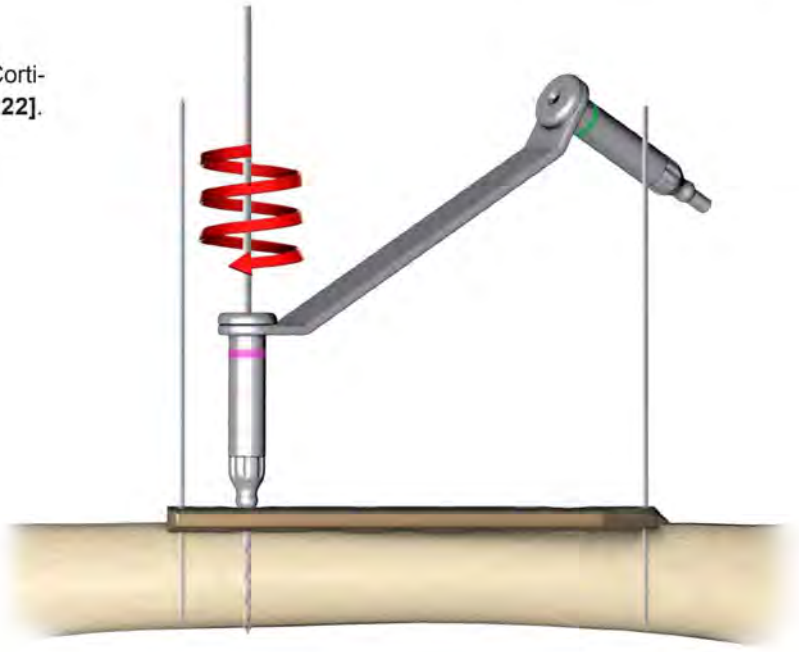
c. Angular position

Angular positioning of the guide is also available.



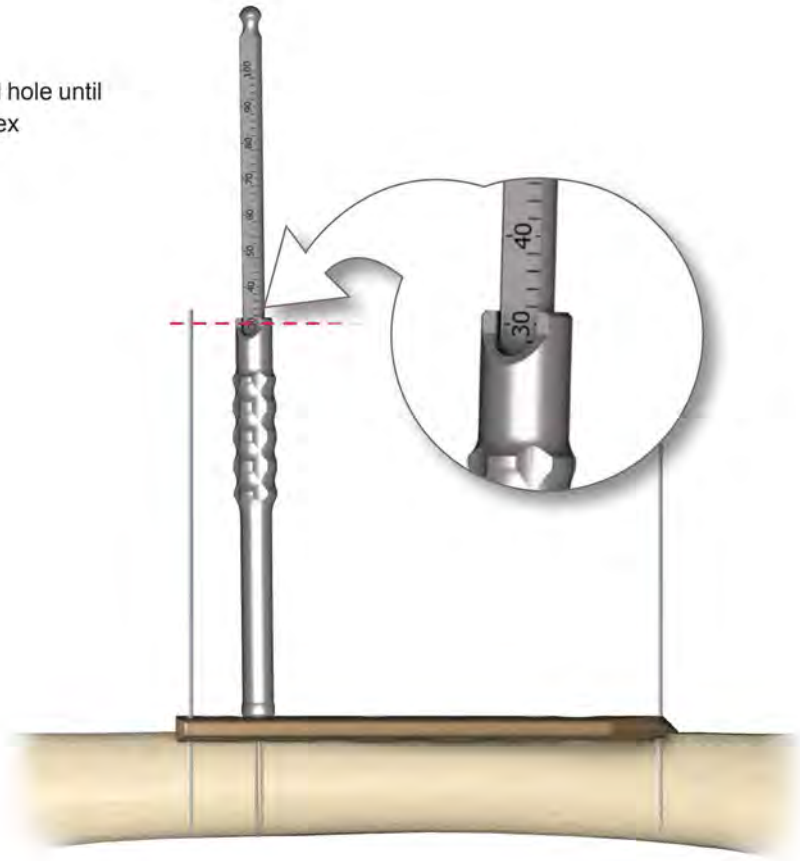
Drilling

Drill the hole through both cortices in desire position for the Cortical screw Ø3.5 insertion using the Drill Ø2.5/220 **[40.5912.222]**.



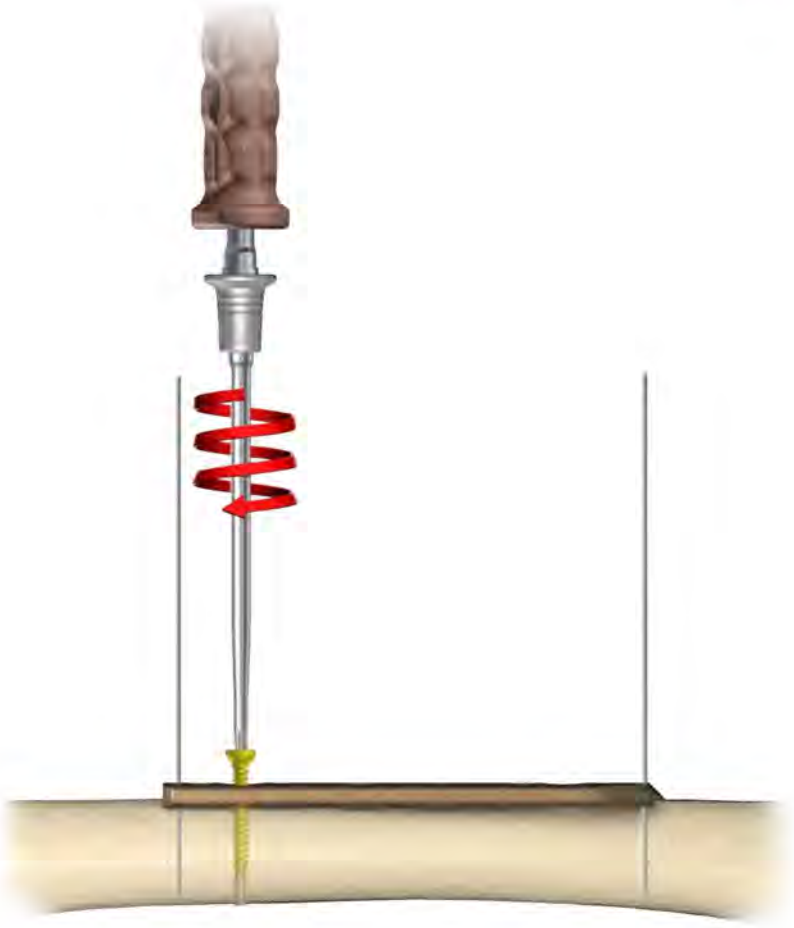
Hole depth measurement

Insert the Depth measure **[40.4639.500]** into the drilled hole until its hook anchors the outer surface of the opposite cortex



Screw insertion

Insert cortical screw Ø3.5.



V. POSTOPERATIVE TREATMENT

Postoperative treatment after locking plates does not differ from treatment after conventional stabilization.

VI. IMPLANT REMOVAL

In order to remove the screws, first unlock all locking screws from the plate. Then remove bone screws. This prevents the rotation of the plate while removing the last locking screw.

NOTE: After removing the tissues from the outer surface of plate and screws recesses, it is recommended to apply aiming block to the plate *(see point. IV.3)*. **The use of a protective guide will ensure that: the screwdriver is positioned in the screw axis, the device is correctly placed in the screw recess and that the risk of twisting the recess while removing the screw is reduced.**