

3.5mm LCP Superior Anterior Clavicle Plates

Surgical Technique



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Plate Features:

The 3.5mm LCP Superior Anterior Clavicle Plates integrate locking screw technology and traditional plating methods.

The plates are offered in stainless steel and titanium, with a limited-contact shaft profile. The Combi holes can be secured with locking screws in the threaded portion for angular stability and cortical screws in the dynamic compression unit (DCU) for compression.

A fixed-angle build gives benefits in osteopenic bone or multifragment fractures, where screws do not rely on plate-to-bone compression to withstand patient load, but work similarly to several, small, angled blade plates.

◆ Lateral Extension Plate

Plates with lateral extensions include six distal locking holes that take 2.7mm locking screws.

The plate shaft has Combi holes for 3.5mm locking, 3.5mm cortical, and 4.0mm cancellous bone screws.

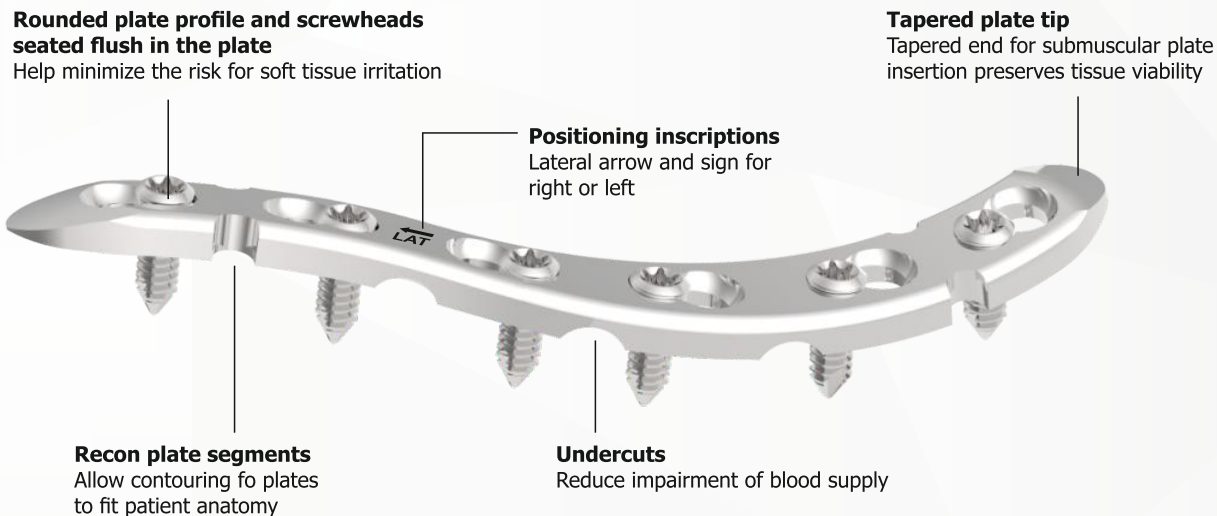
◆ Hook Plate

Clavicle hook plate fixation is used when there is not sufficient bone in the distal clavicular fragment to support a conventional or distal clavicle plate.

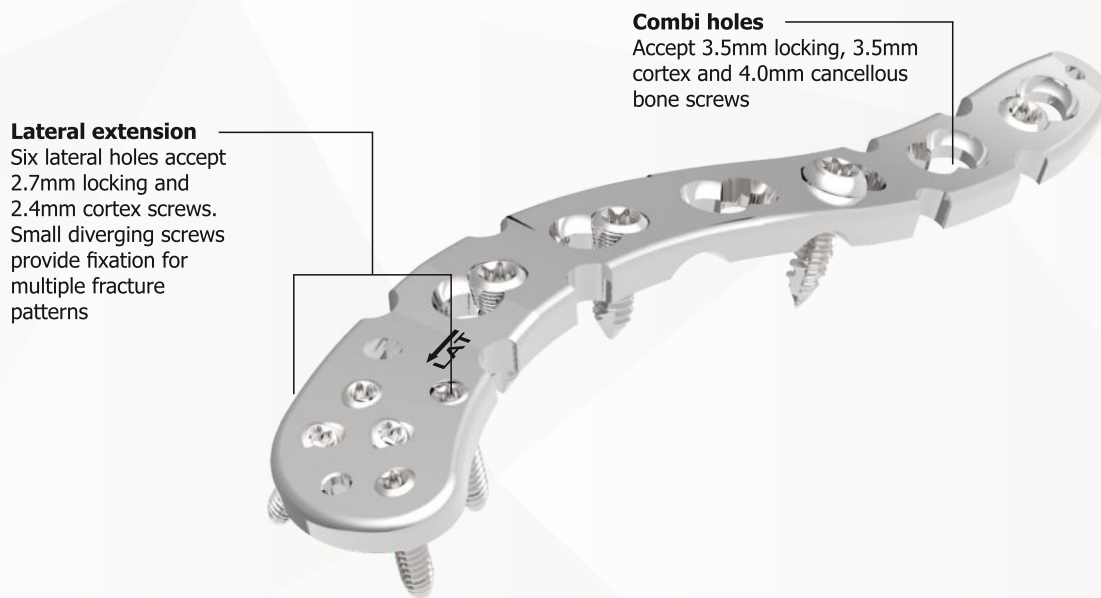
Hook plate fixation is an appealing alternative when unexpected difficulties with distal clavicular fragment fixation arise.



3.5MM LCP SUPERIOR ANTERIOR CLAVICLE PLATES



Plates with lateral extension feature six distal locking holes that accept 2.7mm locking and 2.4mm cortex screws. The Combi holes in the plate shaft accept 3.5mm locking, 3.5mm cortex, and 4.0mm cancellous bone screws.



1. Patient position

A beach-chair or supine position on a radiolucent operating table is recommended to provide appropriate access to the clavicle. AP and lordotic visualization of the clavicle with fluoroscopy is recommended. A roll placed between the scapulas allows retraction of the shoulders and assists with reduction. The head of the patient should be turned away from the operative side and may be supported with a head rest. Prepare the entire upper extremity, the upper chest wall and hemithorax. This includes the sternum and sternoclavicular articulation.





2. Approach

The horizontal incision is placed over the superior or inferior clavicle, depending on stabilization method. Subcutaneous dissection permits identification of the supraclavicular sensory nerve branches. The major fibers of these nerves should be identified and protected with small vessel loops throughout the case. The platysma is carefully divided to expose the clavicle periosteum at the deltotrapezial fascia. Minimal periosteal dissection is carefully done to allow exposure of the fracture. It is critical to not further strip any comminuted fragments.

3. Reduce

After fracture exposure, distract the two main fragments and restore the length of the clavicle. If the bone are angled or oblique, reduction with a pointed or serrated reduction forceps is recommended. Normal length, axis angulation and rotation should also be reduced and temporarily held with small pointed bone clamps or K-wires. The temporary fixation should be planned so as not to interfere with the placement of the definitive fixation.

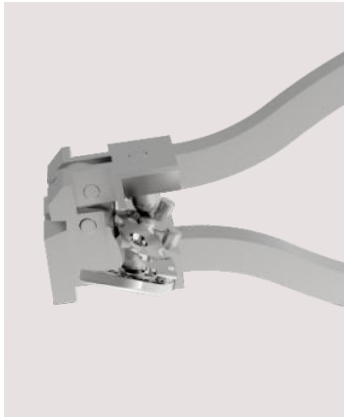


Figure 1



Figure 2

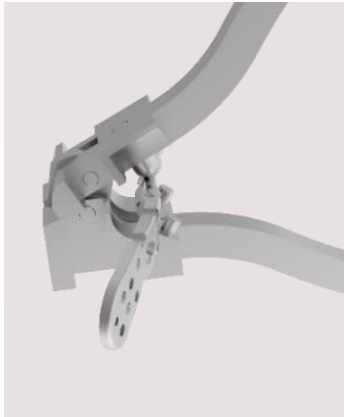


Figure 1



Figure 2

4. Determine plate length and bend plate

Instruments

- 616.013 Universal Plate Bender
- 616A.002 Bending Iron Small for Plates 2.7 and 3.5mm A
- 616B.002 Bending Iron Small for Plates 2.7 and 3.5mm B

Choose a plate length suitable for the fracture.

Due to varying patient anatomy, slight plate bending may be necessary. Using Universal Plate Bender and/or Bending Iron, contour the plate as needed. For an optimum fit, the plate can be bent at each notch in the plane of the shaft.

Note:

Bend the plate anteriorly on the medial end to avoid interference with the chin during drilling and screw insertion.

Precaution:

Do not bend the plate back and forth, as this can weaken it.

5. Insert plate

From the lateral view, the lateral end of either plate sits superiorly and wraps around slightly anterior to the medial end of the clavicle.

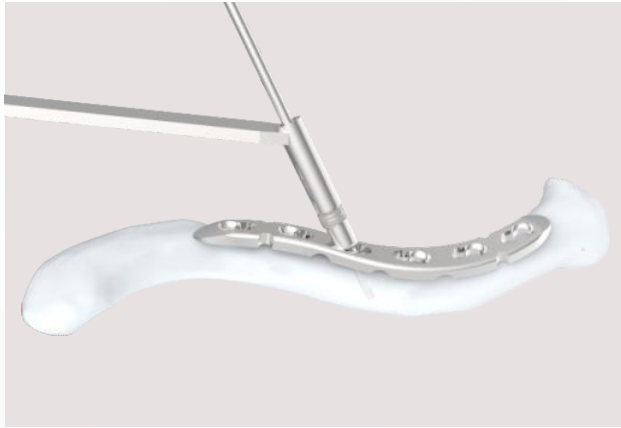
Position the plate on the reduced bone and temporarily secure it with the plate holding forceps. After plate insertion, use fluoroscopy to evaluate the bone's alignment.

The locking plate is pre-contoured to fit the clavicle.

Note:

If the plate shape is modified, it is critical to use screw placement verification to ensure that the screws are in the correct position relative to the joint.

If the LCP Superior Clavicle Plate is utilized for bridging osteosynthesis, at least two locking screws should be installed in each main component. Screws are rarely used to engage the fracture zone itself.



6. Insert Screw

Determine the screw combination that will be utilized for fixation. If a mix of locking and cortical screws is utilized, cortex screws should be put first to ensure that the plate has enough bone contact.

Note:

To secure the plate to the clavicle before inserting the locking screw, use a cortical screw to draw it to the bone.

Precaution:

When drilling through the clavicle, avoid making contact with the subclavian artery or the brachial plexus.

For Cortex Screw

Instruments

- 605A.035 Universal Drill And Tap Sleeve 3.5/2.5mm
- 601.023 Drill Bits 2.5mm x 165mm for Quick Coupling T Handle
- 609.002 Depth Gauge For 3.5mm To 4.0mm Screw Length 80mm
- 612.007 T15 Star Driver for 3.5mm screw
- 603.001 Quick Coupling T Handle

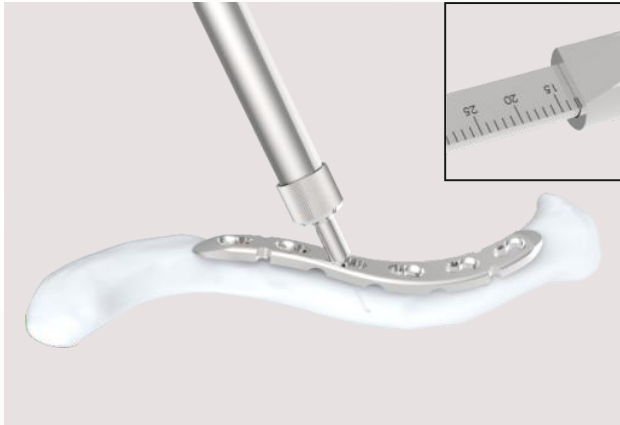
To predrill the bone, insert a 2.5mm drill bit through the 3.5mm Universal Drill And Tap Sleeve. To achieve the neutral position, press the drill guide down in the hole's nonthreaded end. To obtain compression, position the drill guide at the end of the nonthreaded hole, away from the fracture (do not press down on the spring-loaded tip).

6. Insert Screw Continued

For Cortex Screw Continued

The depth gauge can be used to measure screw length.

Select and insert the appropriate length 3.5mm cortex screw using a small hexagonal screwdriver



6. Insert Screw Continued

For Locking Screw

Instruments

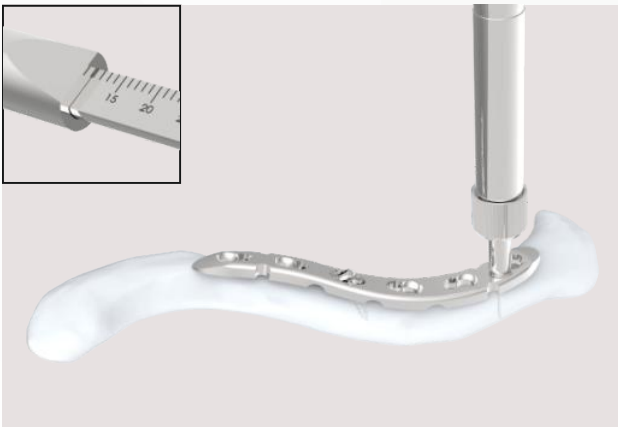
- 733.035 LCP Drill Sleeve 3.5mm, For Drill Bits 2.8mm
- 601.019 Drill Bits 2.8mm x 165mm for Quick Coupling T Handle
- 609.002 Depth Gauge For 3.5mm To 4.0mm Screw Length 80mm
- 612.007 T15 Star Driver for 3.5mm screw
- 603.001 Quick Coupling T Handle

The locking screws direction is set based on normal anatomy. If manual contouring in the metaphyseal area is required, check new screw trajectories with K-wire implantation. The use of image intensification is highly recommended.

If a locking screw will be used as the first screw, ensure that the fracture is decreased and the plate is securely fastened to the bone. The screw is fixed to the plate, which restricts plate rotation.

Insert the 2.8mm threaded LCP Drill Sleeve into a 3.5mm locking hole until fully seated. Use the 2.8mm drill bit to drill to the desired depth. Remove the 2.8mm threaded drill guide.

Use the depth gauge to determine screw length.



6. Insert Screw Continued

For Fixation with 2.7mm locking screws for lateral extension

Instruments

- | | |
|----------|--|
| 733A.027 | LCP Drill Sleeve 2.7mm, For Drill Bits 2.0mm |
| 601.031 | Drill Bits 2.0mm x 145mm for Quick Coupling T Handle |
| 609.004 | Depth Gauge For 2.4mm To 2.7mm Screw Length 60mm |
| 612.008 | T08 Star Driver for 2.4 & 2.7mm screw |
| 603.001 | Quick Coupling T Handle |

Once the 2.7mm LCP drill sleeve is fully installed, screw it into a 2.7mm locking hole. Drill to the required depth with the 2.3mm drill bit. The 2.7mm LCP drill sleeve should be removed. To find the screw length, use the depth gauge.



7. Confirm Reduction and Fixation

Examine the final fixation and reduction carefully using both image intensification and direct viewing. Verify the fixation's stability and entire range of motion with the shoulder. The reduction and proper alignment of the plate and screws should be confirmed by AP and lordotic fluoroscopic imaging.



3.5mm Cortex Screws

Found in the Small Fragment LCP Set

- ▶ May Be used in the DCU portion of the Combi holes
- ▶ Compress the plate to the bone or create axial compression
- ▶ Fully threaded shaft
- ▶ Self-tapping tip



3.5mm Locking Screws

- ▶ Used in the locking portion of the Combi holes or in round locking holes
- ▶ Create a locked, fixed-angle screw/plate construct
- ▶ Fully threaded shaft
- ▶ Self-tapping tip



2.7mm Locking Screws

- ▶ Used in the distal locking hole
- ▶ Fully threaded shaft



Locking Superior Anterior Clavicle Plate 3.5mm (Left & Right)

SS Code No.	Titanium Code No.	Numbers of Holes	Length (mm)
160.06	T160.06	6	90.9
160.07	T160.07	7	104.3
160.08	T160.08	8	117.3

Locking Superior Anterior Clavicle Plate with Lateral Extension 3.5mm (Left & Right)

SS Code No.	Titanium Code No.	Numbers of Holes	Length (mm)
161.03	T161.03	3	66
161.04	T161.04	4	80
161.05	T161.05	5	94
161.06	T161.06	6	107.5
161.07	T161.07	7	121.6
161.08	T161.08	8	134

Locking Clavicle Hook Plate 3.5mm

SS Code No.	Titanium Code No.	Numbers of Holes	Hook Depth(mm)	Length (mm)
162	T162	4	12, 15, 18	70
162	T162	5	12, 15, 18	85
162	T162	6	12, 15, 18	99
162	T162	7	12, 15, 18	112

INSTRUMENTS

601.023 Drill Bits 2.5mm x 165mm for Quick Coupling T Handle	601.019 Drill Bits 2.8mm x 165mm for Quick Coupling T Handle
	
601.031 Drill Bits 2.0mm x 145mm for Quick Coupling T Handle	733A.027 LCP Drill Sleeve 2.7mm, For Drill Bits 2.0mm
	
733.035 LCP Drill Sleeve 3.5mm, For Drill Bits 2.8mm	612.007 T15 Star Driver for 3.5mm screw
	
612.008 T08 Star Driver for 2.4 & 2.7mm screw	609.002 Depth Gauge For 3.5mm To 4.0mm Screw Length 80mm
	
609.004 Depth Gauge For 2.4mm To 2.7mm Screw Length 60mm	605A.035 Universal Drill And Tap Sleeve 3.5/2.5mm
	
616.013 Universal Plate Bender	
	

AGC.16A Small Fragment Locking Instrument and Universal Implant Set

Instruments

601.005	Drill Bits 1.8mm x 125mm for Quick Coupling T Handle
601.031	Drill Bits 2.0mm x 145mm for Quick Coupling T Handle
601.021	Drill Bits 2.3mm x 130mm for Quick Coupling T Handle
601.023	Drill Bits 2.5mm x 165mm for Quick Coupling T Handle
601.024	Drill Bits 2.7mm x 165mm for Quick Coupling T Handle
601.019	Drill Bits 2.8mm x 165mm for Quick Coupling T Handle
603.001	Quick Coupling T Handle
603.027	Tap 2.7mm Cortex Screw For Quick Coupling
605A.024	Universal Drill And Tap Sleeve 2.4/1.8mm
605A.027	Universal Drill And Tap Sleeve 2.7/2.0mm
605A.035	Universal Drill And Tap Sleeve 3.5/2.5mm
606.035	Counter Sink for 3.5mm
607.035	DCP Drill Sleeve 3.5mm for use 2.5mm Drill
609.002	Depth Gauge For 3.5mm To 4.0mm Screw Length 80mm
609.004	Depth Gauge For 2.4mm To 2.7mm Screw Length 60mm
609.008	Open Measuring Device
610.002	Screw Forceps Self Holding
612.011	Quick Coupling Stright Handle
614.025	Shaft Small Hexagonal Screw Driver 2.5mm Tip
616.013	Universal Plate Bender
617.001	Sharp Hook
619.035	Screw Remover With Quick coupling 2.5mm Hex
655.006	Bone Curette Small 4mm x 6mm
660.010	Triple Drill Guide 2.0mm with 3hole Opposite side 1hole
660.013	K Wire Bender Iron
660.014	Universal Wire Cutter/Bender/Pilers
687.144	Self-centering Bone Holding Forceps Length 144mm
687.191	Self-centering Bone Holding Forceps Length 191mm
688.146	Reduction Forceps Serrated jaws Length 146mm
689.126	Reduction Forceps With Points Length 126mm
689.140	Reduction Forceps With Points Length 140mm
689.205	Reduction Forceps With Points Length 205mm
706.008	Retractor 8mm wide
706.015	Retractor 15mm wide
711.001	Periosteal Elevator Curved Blade 6mm wide
733.020	LCP Drill Sleeve For variable angle plate 2.4mm, For Drill Bits 1.8mm
733.021	Outer Sleeve 6.0/5.0 for Plate
733.022	Drill Sleeve 2.8mm
733.023	Sleeve for K Wire 1.6mm
733.024	LCP Drill Sleeve 2.4mm, For Drill Bits 1.8mm
733.027	LCP Drill Sleeve 2.7mm, For Drill Bits 2.3mm
733.035	LCP Drill Sleeve 3.5mm, For Drill Bits 2.8mm
734.024	Tap 2.4mm Locking Screw For Quick Coupling
734.027	Tap 2.7mm Locking Screw For Quick Coupling
734.035	Tap 3.5mm Locking Screw For Quick Coupling
735.06	Torque Limit Adapter 0.8 Nm
735.07	Torque Limit Adapter 1.5 Nm
738.035	LCP Plate Holder 3.5mm Length 100mm
603A.035	Tap 3.5mm x 110mm for Quick Coupling
603A.040	Tap 4.0mm x 110mm for Quick Coupling
612A.025	Screw Driver for Holding Sleeve
613A.025	Holding Sleeve for Locking screws 3.5/4.0mm
613B.025	Holding Sleeve for Non Locking screws 3.5/4.0mm
614.T08	Shaft for Star Screw Driver T08 Tip for 2.4/2.7mm screws
614.T15	Shaft for Star Screw Driver T15 Tip for 3.5/4.0mm screws
614.020	Shaft for Hexagonal Screw Driver 2.0mm Tip for 2.4/2.7mm screws
616A.002	Bending Iron Small for Plates 2.7 and 3.5mm
616B.002	Bending Iron Small for Plates 2.7 and 3.5mm
805.007	4mm Tommy Bar
328B.15	K Wire (Double Side Trocar Tip) 1.5mm x 150mm
328B.18	K Wire (Double Side Trocar Tip) 1.8mm x 150mm
328B.20	K Wire (Double Side Trocar Tip) 2.0mm x 150mm
613C.027	Holding Sleeve for Locking screws 2.4/2.7mm
613D.027	Holding Sleeve for Non Locking screws 2.7mm





House of Ortho Tools

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