

AOS Clavicle Intramedullary Device

Surgical Technique

1. Indications

The AOS Clavicle Intramedullary Device is intended to be used to repair an acute fracture, mal-union, or non-union of the Clavicle.

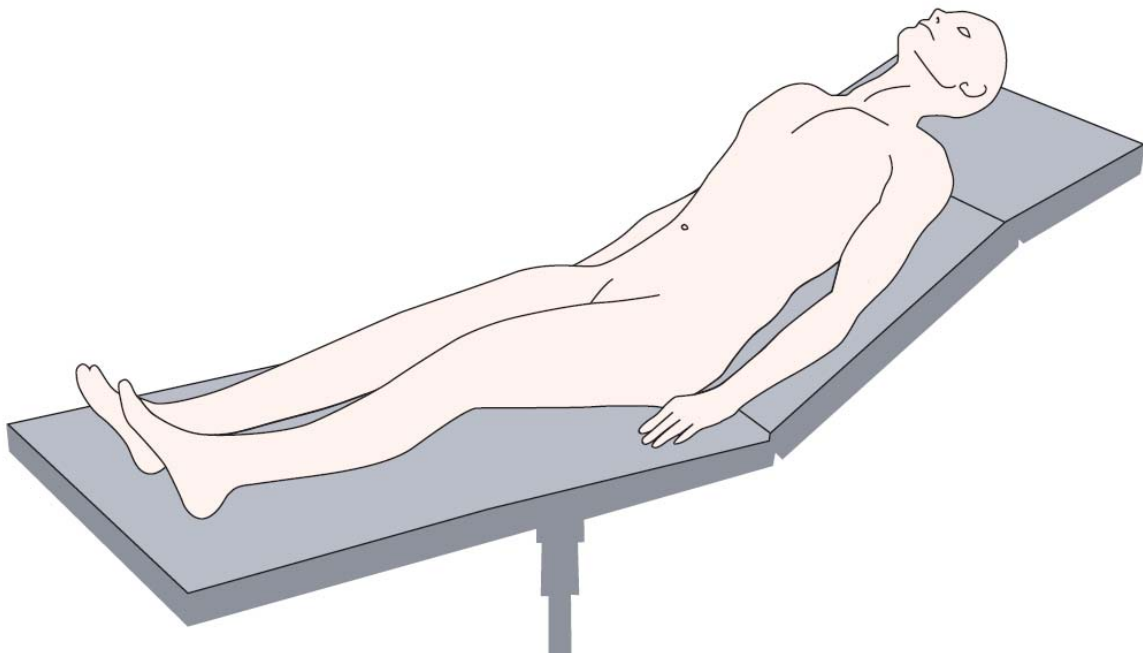
2. Patient Positioning

Place the patient in the beach chair or supine position on the operating table. Place a bolster between the shoulder blades to help facilitate fracture reduction during the procedure. A C-arm facilitates pin placement. Bring the C-arm base in from the head of the bed with the C-arm rotated slightly away from the operative shoulder and oriented with a cephalic tilt. Take preliminary images before the patient is prepped and draped to confirm adequate visualization and reduction capabilities. Prep and drape the operative extremity free allowing the arm to be manipulated to help further reduce the fracture if needed. For complete access to the clavicle and associated joints, be sure to include the sternal notch in the operative field.

3. Incision

Make a 3cm incision along Langer's lines over the distal end of the medial fracture fragment. Make full thickness subcutaneous flaps on either side of the incision, taking care to prevent injury to the underlying platysma muscle and cutaneous nerves.

Divide the fibers of the platysma muscle longitudinally. Identify and protect the intermedial supraclavicular nerve, usually found directly beneath the platysma muscle near the midclavicle. Carefully elevate the periosteum around the fracture site and remove any tissue interposed between the ends of the bone fragments (**0821**). Leave small butterfly fragments attached to their soft tissue envelope.

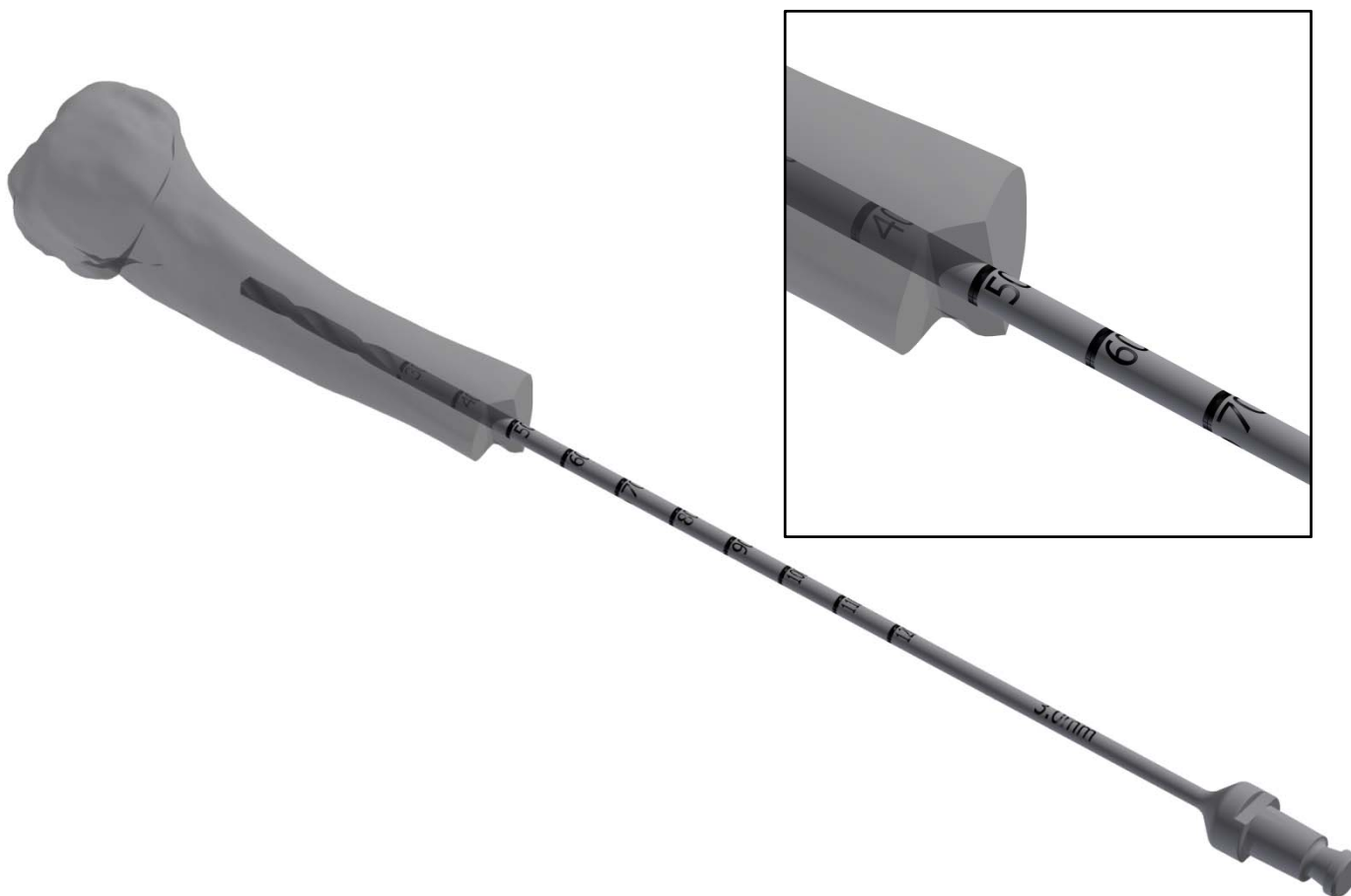


4. Drilling the Medial Fragment

Elevate the proximal end of the medial clavicle through the incision using a towel clip, elevator or bone-holding forceps (**0819**). Attach the appropriate sized drill to the ratchet T-handle or Drill and drill the intramedullary canal, taking care not to penetrate the anterior cortex,

To ensure instrumentation maintains the correct path, hold the medial fragment with bone holding forceps (**0819**). Insert the 3.0mm Calibrated Drill (**0275-000**) in the medial portion of the fracture and drill in the lateral to medial direction, making sure not to exit the bone through fluoroscopy. If the 3.0mm drill does not engage the bone, the 3.8mm or 4.3mm cannulated drills (**0276 or 0277**) may be used as an alternative.

Each drill is laser marked in 10mm increments. Note the final depth measurement of the drill to help determine the length of the device to be implanted later.



5. Drilling the Lateral Fragment

Elevate the lateral fragment through the incision. The 3.0mm Calibrated Drill (**0275**/Option A) or a Trocar Tip Guide Wire (**0114**/Option B) may be used to pass the instrument under the C-arm guidance and out through the posterolateral cortex of the clavicle, which will be posterior to the acromioclavicular joint.

Option A

Insert the 3.0mm Calibrated Drill (**0275**) in the lateral portion of the fracture and drill in the medial to lateral direction. Drill forward and as the skin begins to tent, make a stab incision. Advance the drill out the skin laterally.

Fluoroscopy helps ensure a precise posterior-lateral exit point. Otherwise the drill may exit the superior surface of the clavicle.

Introduce a Round Tip Guide Pin (**0115**) in place of the 3.0mm Calibrated Drill.

Option B

Insert a 1.5mm Trocar Tip Guide Pin (**0114**) through the lateral portion of the fracture and drill in the medial to lateral direction. Advance the pin forward and as the skin begins to tent, make a stab incision. Advance the pin out of the skin laterally.

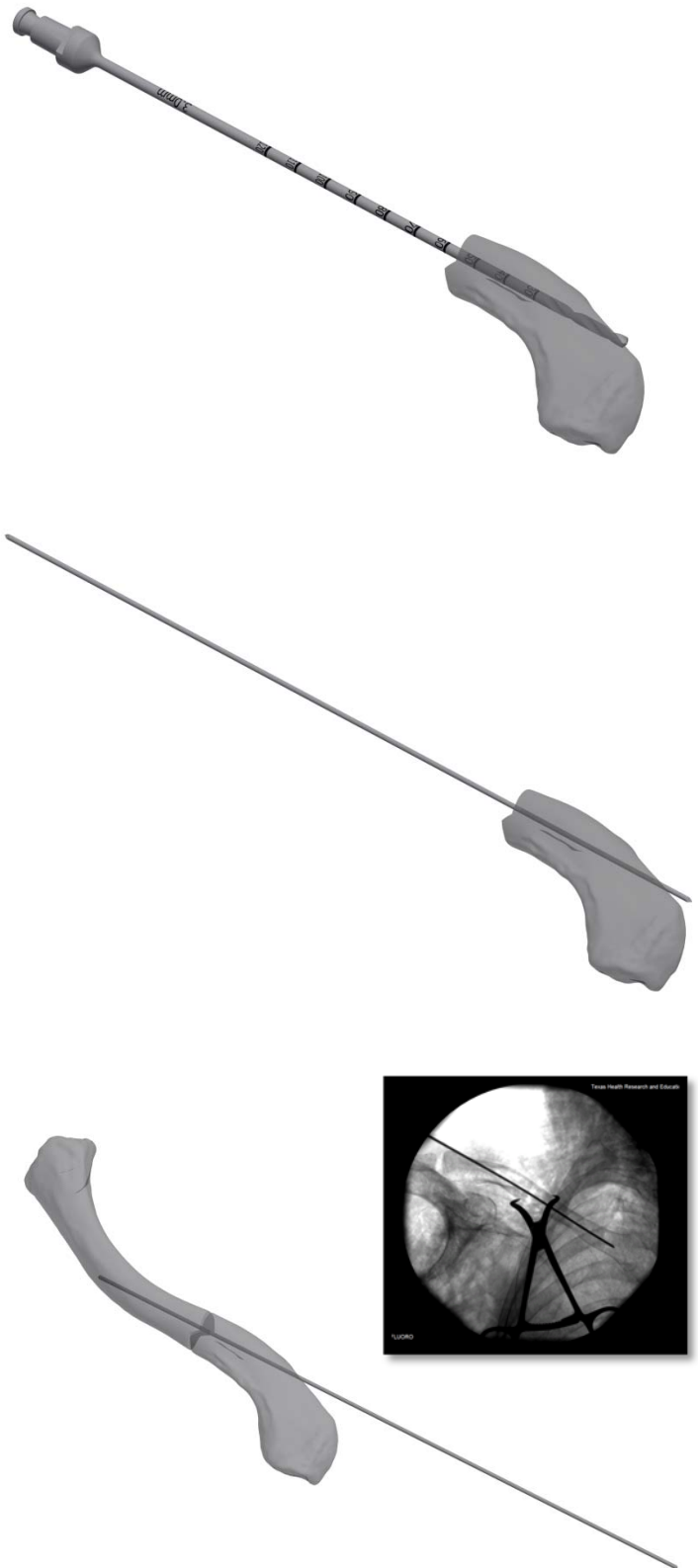
Fluoroscopy helps ensure a precise posterior-lateral exit point. Otherwise the pin may exit the superior surface of the clavicle.

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6. Preliminary Reduction & Alignment

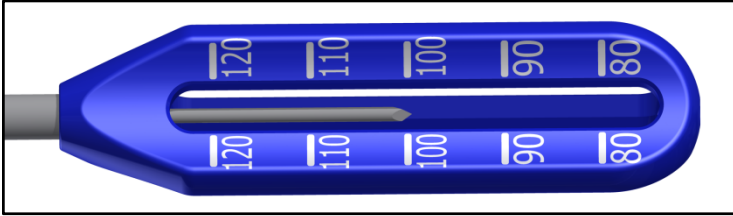
Align and reduce the fracture and insert the guide pin through both fragments.

Check under fluoroscopy that the trajectory of the guide pin is correctly aligned.



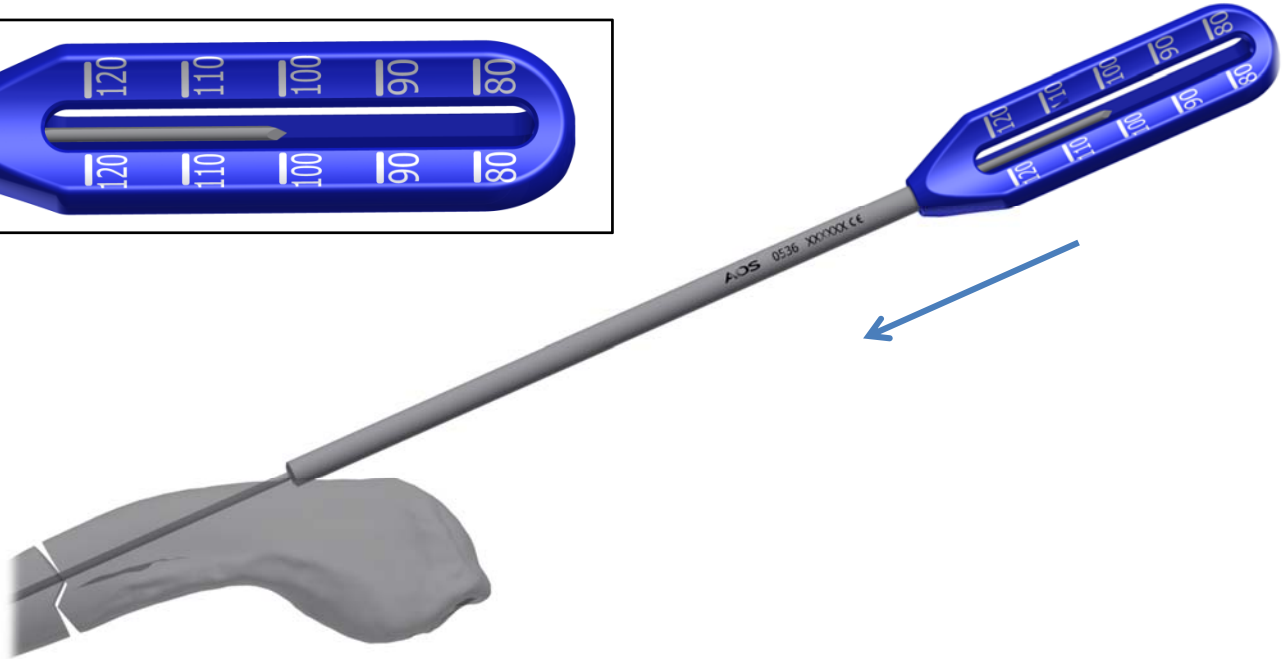
7. Implant Selection

The nail length can be determined by sliding the Guide Wire Depth Gauge (0536) over the guide pin to the entry site and reading the appropriate length direction from the end of the guide wire.



8. Proximal Preparation

Advance the 5.0mm Cannulated Entry Reamer (4000) over the guide pin and ream the proximal portion of the implant insertion site. This prepares the canal for the proximal diameter of the implant.



9. Drilling and Tapping

Advance the 3.8mm Cannulated Drill (0276) over the 1.5mm Guide Pin in the lateral to medial direction. If the drill does not engage with the inner diameter of the intramedullary canal, switch to the 4.3mm Cannulated Drill (0277). Drill to the appropriate depth with use of the calibration lines.

Tapping reduces the torque required to insert the device. Chuck the 4.3mm, 5.1mm or 5.6mm Taps (0281/0282/4005) onto the Comfort T-Handle. Holding the medial fragment with a serrated clamp, advance the appropriate cannulated tap in a lateral to medial direction from the lateral entry site over the guide pin.

Implant	Drill	Tap
2.7mm Device	3.0mm Drill	4.3mm Tap
3.5mm Cannulated Device	3.8mm Cannulated Drill	5.1mm Cannulated Tap
4.0mm Cannulated Device	4.3mm Cannulated Drill	5.6mm Cannulated Tap



10. Implant Insertion

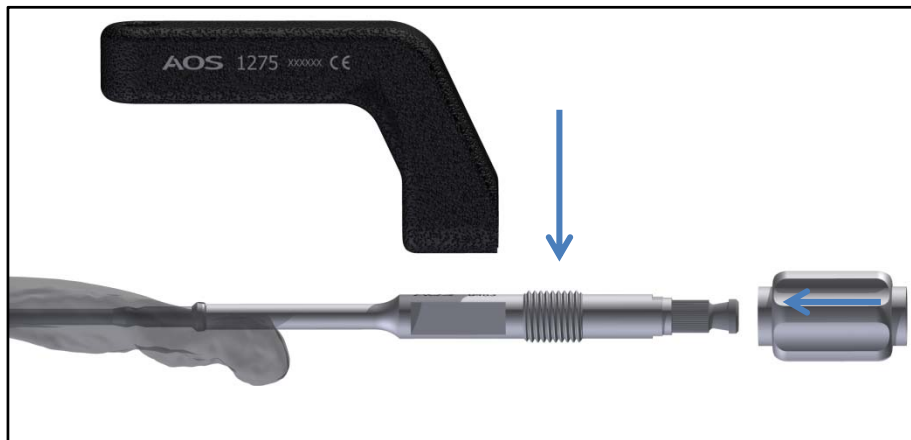
Attach the device onto the keyed driver (0483) and thread the capturing rod through the assembly. Attach the captured device on to a Hudson T-Handle (0468) or onto power. Insert the device in a lateral to medial direction until fully inserted within the intramedullary canal.

Reduce the fracture and pass the implant through the medial fragment. The weight of the arm usually pulls the arm downward; therefore, the shoulder needs to be lifted up to facilitate implant passage into the medial fragment.



11. Locking Screw Insertion

After the implant has been completely inserted across the fracture site, attach the Targeting Arm (1275) by sliding it onto the flats of the Keyed Driver and secure it by threading the Locking Knob (1276) on the back of the driver.



Lock the 2.0mm Drill Guide (0342) inside the Screw Sheath (0628) and insert it inside the targeting arm. Under fluoroscopic guidance, use the 2.0mm Calibrated Drill (0252-100) to drill through the locking hole of the implant and the far cortex. Read the calibration line on the Drill that line up with the end of the drill guide to determine screw length.

Remove the drill and drill guide. Insert the appropriate length 2.7mm screw using the 2.5mm Hex Screw Driver (0459/5006).

Remove the targeting arm and insertion instruments.

12. Incision Closure

Final verification using fluoroscopy is recommended to check correct positions of the implants. Use the appropriate method for surgical closure of the incision.



13. Implant Removal

To extract the device, remove the 2.7mm interlocking screw and attach the extraction tool to the end of the implant. Turn the device counter clockwise until the implant is completely out of the clavicle.

