Subcondylar/Ramus Fixation Set

TECHNIQUE GUIDE

SYNTHESE® Instruments and implants approved by the AO Foundation
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Subcondylar/Ramus Fixation Set

The Subcondylar/Ramus Fixation Set [115.680] includes specialized instrumentation designed to support the endoscopic treatment of trauma and orthognathic surgery involving the subcondylar/ramus region of the mandible. The set:

• Supports and enhances AO ASIF principles of internal fixation with improved patient benefits:
  – Reduced scarring;
  – Reduced risk to the facial nerve;
  – Shorter recovery time.
• Supports intraoral and submandibular endoscopic approaches.
• Supports open surgical approaches to trauma and orthognathic surgical procedures.
• Creates and maintains the optical cavity while achieving reduction and internal fixation.
• Assists in the manipulation of bone fragments.
• Facilitates controlled in-plane articulation of plates for anatomically correct placement and stabilization.

Indications

Subcondylar Fracture Management

• Endoscopic or open treatment of a noncomminuted subcondylar fracture of the mandible with plate and screw fixation in which a minimum of two screws can be placed through a plate into the proximal fracture fragment.
• Reduction of dislocated fracture fragment.

Orthognathic Surgery

• Endoscopic or open orthognathic procedures involving the ramus and condylar region of the mandible such as:
  – vertical ramus osteotomy with rigid fixation
  – condylectomy
  – condylotomy

This technique guide addresses the endoscopic intraoral and submandibular approaches to subcondylar fractures only.
AO Principles

Anatomic Reduction
Specialized instrumentation assists in the exposure and reduction of the fracture or osteotomy.

Atraumatic Surgical Technique
Endoscopic approach reduces required dissection. Less disturbance of the soft tissue promotes rapid healing and return to function.

Stable Internal Fixation
Plate and screws provide stability for both the subcondylar fracture and ramus osteotomy.

Early, Active, Pain-Free Mobilization
Stable fixation eliminates traditional, long-term maxillomandibular fixation (MMF) permitting an early return to function.
Instruments in the Subcondylar/Ramus Fixation Set

**Double-Ended Elevator, straight, 240 mm [398.415]**
For soft tissue dissection

**Double-Ended Elevator, 20 cm, size 1 [U44-482-20]**
For soft tissue dissection and fracture reduction

**Optical Retractor Handle [386.915]**
Retracts soft tissue to provide optical cavity while securing endoscope in desired position. Use with interchangeable retractor blades.

**Freer Suction Elevator and 1.8 mm Cleaning Stylet [386.906]**
For soft tissue dissection and removal of fluid for improved visualization

**Retractor Blade, 12 mm width [386.917]**

**Retractor Blade, 17 mm width [386.918]**
Used with Optical Retractor Handle for retraction of soft tissue and maintaining optical cavity. Opening in 17 mm blade allows passage of 2.0 mm Cannula and Obturator

**4.5 mm Pin Wrench [321.17]**
2.0 mm Cannula and Obturator, threaded, long [386.914]*
Provides portal for drilling and placing screws. Accepts threaded cheek retractor ring for retraction of soft tissue.

Cheek Retractor Ring, threaded [386.908]*
Optional instrument for retraction of soft tissue. Used with the 2.0 mm threaded cannula.

Universal Trocar Handle [397.211]
Aids insertion and positioning of 2.0 mm Cannula and Obturator

Fragment Manipulating Forceps [386.912]
Reduces fracture fragments. Aids assembly of Cheek Retractor Ring to 2.0 mm threaded cannula.

Subcondylar Elevator, angled right [386.910]
Subcondylar Elevator, angled left [386.911]
Supports and manipulates fracture fragments to achieve fracture reduction
Instruments in the Subcondylar/Ramus Fixation Set
(continued)

2.0 mm Cannula and Obturator, self-retaining [386.904]
Provides portal for drilling and placing screws

Fragment Manipulator, threaded, 1.9 mm, self-drilling [386.902]
Aids fracture reduction and temporary plate fixation

Handle, with mini quick coupling [311.01.98]
Used for inserting the Threaded Fragment Manipulator and with screwdriver blades

Fragment Manipulator Handle [386.903]
Used with the Threaded Fragment Manipulator to aid in fracture reduction

Plate Holding Tip [386.901]
Articulating Plate Introducer with Plate Holding Tip [386.900]
Aids in plate insertion and alignment
1.5 mm/2.0 mm Screwdriver Blade, self-retaining, wedge, long [313.923]
For screw insertion and to secure the plate to the Plate Holding Tip of the Articulating Plate Introducer

1.5 mm Drill Bit, Stryker J-latch, 110 mm [317.835]
Creates hole for insertion of 2.0 mm screws

1.5 mm Insert Drill Guide, long [386.913]
Provides portal for predrilling for screws

Hook, angled, 1.5 mm flat tip [386.905]
Assists in plate positioning and fracture reduction

Retractor, 8 mm x 60 mm [386.920]
Assists with retraction of soft tissue when creating a limited temporary optical cavity

Plate Holding Forceps [347.98]
Assists with handling of plates and screws
Intraoral Less Invasive Approach—Subcondylar Fracture Repair

Preparation

1. Identify and mark landmarks
   Prior to patient intubation, identify and mark the following relevant anatomic landmarks of the mandible and outline the fracture site or planned osteotomy:
   - Midline
   - Inferior border
   - Sigmoid notch
   - Angle
   - Posterior border
   - Temporomandibular joint
   - Zygomatic arch
   - Anterior border
   - Superior border of the body

2. Position video monitor for endoscope
   The top and both sides of the patient’s head must be accessible to the surgeon and assistant. Position the video monitor for the endoscope at the head of the operating table towards the patient’s contralateral shoulder. The surgeon should stand on the ipsilateral side and the assistant on the contralateral side of the incision site.

3. Place patient in MMF
   Place the patient in temporary MMF with elastic traction.

Note: Address other fractures, if present, prior to subcondylar fracture fixation.
Fracture Exposure and Creation of Optical Cavity

1  Expose fracture

Expose the fracture through a 2 cm intraoral incision, along the anterior border of the ascending ramus, carried down to the periosteum.

2  Create optical cavity

Create an optical cavity for visualization by elevating the soft tissue in a subperiosteal plane from the entire lateral ramus of the mandible and the posterior border. Using the straight or curved double-ended elevators [398.415 or U44-482-20] create a wide subperiosteal dissection to provide a large optical cavity for improved visualization.

3  Insert endoscope

Retract the soft tissue and insert the endoscope, with matching irrigating sheath, into the optical cavity. Lighted telescopes, of 2.7 mm through 4.0 mm diameter and with 30° or 45° angles, are commonly used for this application.
Fracture Exposure and Creation of Optical Cavity (continued)

4 Carry dissection proximally

Carry the periosteal dissection proximally using the double-ended elevators or the Freer Suction Elevator [386.906] to maximize visualization and access. Continue dissection along the posterior border and over the lateral surface of the proximal fragment after it is identified.

Note: Fit a suction tube onto the back end of the Freer Suction Elevator and activate suction by placing a finger over the port.

5 Assemble the optical retractor

Insert the endoscope with sheath into the assembled optical retractor.

Note: The optical retractor assembly consists of two parts, the Optical Retractor Handle [386.915] which accepts a lighted endoscope with sheath (2.7 mm–4.0 mm), and a Retractor Blade, available in two widths, 12 mm [386.917] and 17 mm [386.918]. The 17 mm blade is typically used for the intraoral approach.

To assemble the retractor, first place the appropriate Retractor Blade into the coupling nut on the Optical Retractor Handle and secure by finger tightening the nut. (Fig. 5A) Then insert the endoscope with sheath into the securing clamp on the Optical Retractor Handle. (Fig. 5B) Position the endoscope so that the preferred view is obtained. Secure by turning the knob. (Fig. 5C)

Attach the optional handle extension to the Optical Retractor Handle for alternate holding positions. (Fig. 5D)

Note: To prevent damage to the endoscope, the appropriate sheath must be used.
6 Place optical retractor assembly

Insert the optical retractor assembly with endoscope into the optical cavity and place the hooked tip around the posterior border.

Complete dissection of the proximal fragment as necessary for plate placement. Support of the retractor and endoscope can be transferred to an assistant.

Note: Sufficient periosteum must be elevated from the posterior border of the ramus to allow placement of the optical retractor.
Fracture Exposure and Creation of Optical Cavity
(continued)

Optional Technique:
The Cheek Retractor Ring, threaded [386.908] when assembled to the 2.0 mm Threaded Cannula may be used as an alternative to the optical retractor assembly. The cannula will also provide a transbuccal portal for drilling and passage of 2.0 mm screws.

Insert the 2.0 mm Cannula and Obturator, threaded, long [386.914] into the Universal Trocar Handle [397.211].

Make a cutaneous puncture for the trocar placement at a point perpendicular to, and directly over, the subcondylar fracture line. A curved clamp may be inserted into the intraoral incision and the cheek pushed out over the fracture to identify the correct placement of the trocar stab incision.

Note: The patient should not be paralyzed during insertion of the trocar so stimulation to the facial nerve can be identified and the trocar redirected if necessary. Initial spreading dissection with a clamp prior to trocar insertion is helpful.

Insert the cannula and obturator through the stab incision and press down to the bone.

Thread the Cheek Retractor Ring onto the 2.0 mm Cannula, threaded [386.914] using the Fragment Manipulating Forceps [386.912]. Rotate the cannula head clockwise to engage the ring on the threads of the cannula.
Fracture Reduction

Fracture reduction is often the most challenging part of the surgical procedure. Musculoskeletal forces typically drive the ramus superiorly resulting in proximal fragment override. Distracting the mandible inferiorly can significantly aid in reduction. Transverse fractures so reduced may provide sufficient interfragmentary friction to maintain reduction during plating.

1 Distract the mandible

Distract the mandible if necessary. This may be accomplished by placing the straight elevator between the patient's molars and rotating it. Distraction may also be achieved by using the Fragment Manipulating Forceps [386.912] to grasp the angle and distract as needed. Release MMF elastics if necessary but reapply after reduction.
Reduce the fracture

Option 1
Reduce the laterally displaced proximal fragment by manipulating it medially. Use the obturator tip, Freer elevators or Fragment Manipulating Forceps to aid reduction.

Option 2
Use the Subcondylar Elevator, angled right [386.910] or left [386.911] to laterally reduce a medially displaced fragment.
Reduce the fracture (continued)

Option 3

Reduction can also be achieved using the Threaded Fragment Manipulator [386.902] and Fragment Manipulator Handle [386.903].

First insert the 2.0 mm Cannula and Obturator, self-retaining [386.904] through a trocar incision at a suitable location, superior to the fracture line, where the top plate hole will be located. Remove the obturator and insert the Threaded Fragment Manipulator through this 2.0 mm cannula.

**Note:** The patient should not be paralyzed during insertion of the trocar so stimulation to the facial nerve can be identified and the trocar redirected if necessary. Initial spreading dissection with a clamp prior to trocar insertion is helpful.

The Threaded Fragment Manipulator is self-drilling and must be fully inserted into the proximal fragment using the screwdriver Handle, with mini quick coupling [311.01.98].

**Note:** This device should be used only in healthy bone, in an area with adequate bone stock to prevent splitting the bony margins.

Prior to manipulation of the bone, replace the screwdriver handle with the lightweight Fragment Manipulator Handle for manipulation and reduction of the proximal fragment.

**CAUTION:** If the screwdriver handle is not replaced, loss of reduction and bending of the Threaded Fragment Manipulator may occur.

Gently manipulate the fracture fragment until reduction is achieved.

**Note:** See Step 3, page 18, for use of the Threaded Fragment Manipulator in conjunction with a plate.
Fracture Fixation

Stable fracture fixation may be achieved using a 2.0 mm Dynamic Compression Plate affixed with a minimum of two screws, but preferably three screws, on either side of the fracture.

1 Load plate onto Articulating Plate Introducer

Load the desired 2.0 mm plate onto the flexible Plate Holding Tip of the Articulating Plate Introducer [386.900] by first ensuring that the “U” (unlocked position) on the retention fastener is aligned with the arrow on the Plate Holding Tip. The cruciform 1.5 mm/2.0 mm Screwdriver Blade [313.923] and Handle, with mini quick coupling, may be used to achieve alignment if necessary.

Turn the Plate Holding Tip so the cruciform retention fastener faces downward. Turn the selected Dynamic Compression Plate over to view the underside of the plate (the beveled edges of the DCP holes are not visible). Assemble the plate to the Plate Holding Tip by placing an end hole over the post on the back of the Plate Holding Tip and pressing it into place.

Turn the plate and holder over so that the retention fastener faces up. Secure the plate to the Plate Holding Tip using the cruciform screwdriver blade. Turn the retention fastener clockwise 1/4 turn, so the arrow points to the “L” (locked) position.

Turn retention fastener 1/4 turn clockwise to lock plate into place.
1 Load plate onto Articulating Plate Introducer (continued)

The plate may now be angulated left or right, as needed, by sliding the two-part grooved handle of the Articulating Plate Introducer between the thumb and forefinger.

2 Position and contour the plate

Insert the Articulating Plate Introducer (with plate attached) through the intraoral incision and angulate the plate in the desired orientation. Position the plate along the posterior border of the mandible, allowing for a minimum of two screws to be placed on either side of the fracture. Three screws on either side of the fracture are optimal.

Once the plate is in the proper position over the fracture, evaluate any need for contouring. Remove the introducer and plate and contour the plate as needed to match the anatomy. Reinsert the plate and confirm that the contouring and the reduction are adequate.

The Angled Hook [386.905] may also be used to assist in positioning the plate.
Fracture Fixation (continued)

3 Temporarily fix the plate using the Threaded Fragment Manipulator

When the Threaded Fragment Manipulator is used for temporary plate fixation, it must be inserted into the proximal fragment using the screwdriver Handle, with mini quick coupling [311.01.98].

Insert the Threaded Fragment Manipulator through the cannula into the most superior plate hole and thread into the bone. The fragment manipulator must be fully inserted against the plate before manipulation of the fragment.

*Note: This device should only be used in healthy bone with adequate bone stock to prevent splitting the bony margins.*

Replace the screwdriver handle with the Fragment Manipulator Handle [386.903] prior to manipulating fragment.
Drill first screw hole and place screw

Place the 1.5 mm Insert Drill Guide, long [386.913] through the 2.0 mm Threaded Cannula [386.914] and position the tip into the plate hole just distal to the fracture. Drill with the 1.5 mm Drill Bit [317.835]. Remove the drill guide and insert the appropriate length 2.0 mm screw.

Note: Low-profile, right-angled drills can be used in this application.

Drill and insert remaining screws

Insert the next screw into the plate hole just proximal to the fracture. Insert screws into all remaining visible plate holes. The sequence in Figure 1 is recommended.
Fracture Fixation (continued)

6 **Remove the Articulating Plate Introducer**

Remove the Articulating Plate Introducer from the plate by turning the retention fastener a 1/4 turn counterclockwise to the “U” (unlocked position).

7 **Drill and insert screw**

Drill for the remaining distal hole and insert the appropriate length 2.0 mm screw.
8 Remove Threaded Fragment Manipulator and insert screw

Remove the Threaded Fragment Manipulator and insert the appropriate length 2.4 mm emergency screw through the 2.0 mm cannula and into the hole created by the Threaded Fragment Manipulator.

*Note: The Threaded Fragment Manipulator is single use only and should be discarded after use.*

9 Confirm reduction

Confirm proper reduction and inspect the anterior and posterior borders of the fracture through the endoscope.
Submandibular Less Invasive Approach—Subcondylar Fracture Repair

Preparation

1 Identify and mark landmarks
Prior to patient intubation, identify and mark the following relevant anatomic landmarks of the mandible and outline the fracture site or planned osteotomy:

- Midline
- Inferior border
- Antigonial notch
- Angle
- Posterior border
- Temporomandibular joint
- Zygomatic arch
- Anterior border
- Superior border of the body
- Sigmoid notch

2 Mark incision site
Draw a line from the sigmoid notch, parallel to the posterior border, extending to the submandibular area, and mark a 1.5 cm incision parallel to the neck skin crease located at the angle of the mandible.

Note: It is important that the incision be at the mandible angle, to allow an endoscope to fit in the wound parallel to the anterior/posterior borders of the vertical ramus.
3. **Position video monitor for endoscope**

The top and both sides of the patient’s head must be accessible to the surgeon and assistant. Position the video monitor for the endoscope at the head of the operating table towards the patient’s contralateral shoulder. The surgeon should stand on the ipsilateral side and the assistant on the contralateral side of the incision site.

4. **Place patient in MMF**

Place patient in temporary MMF with wire or elastic traction.

*Note: Address other fractures if present prior to subcondylar fracture fixation.*
Exposure and Creation of the Optical Cavity

1. Make a 1.5 cm submandibular incision
   Make a 1.5 cm submandibular incision, 1.5 cm to 2.0 cm below the mandible angle, to avoid the marginal mandibular branch of the facial nerve.

2. Dissect through the fascia
   Spread the tissue with a curved hemostat down to the platysmal layer. Using Senn retractors, stretch the incision both vertically and horizontally. With the retractors parallel to the wound and facial nerve, dissect through the fascia down to the masseter muscle plane.
**3. Extend the dissection to the bone**

Extend the dissection down to the bone, and then superiorly in a subperiosteal plane. To increase the optical cavity and visualization, complete the dissection over the lateral surface of the proximal fragment after it is identified.

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**Note:** Use the Double-Ended Elevators, curved [U44-482-20] and straight [398.415] or the Freer Suction Elevator [386.906] to maximize visualization and access. Fit a suction tube onto the back end of the Freer Suction Elevator and activate suction by placing a finger over the port.
Exposure and Creation of the Optical Cavity (continued)

4 Create optical cavity
Insert the angled Retractor [386.920] or Optical Retractor Handle with the appropriate retractor blade to obtain a limited temporary optical cavity.

5 Insert endoscope
Retract the soft tissue and insert the endoscope, with matching irrigating sheath, into the optical cavity. Lighted telescopes, of 2.7 mm through 4.0 mm diameter and with 30° or 45° angles, are commonly used for this application.

6 Carry dissection proximally
Carry the periosteal dissection proximally, using the double-ended elevators or the Freer Suction Elevator [386.906] to maximize visualization and access. Continue dissection along the posterior border and over the lateral surface of the proximal fragment after it is identified.

Note: Fit a suction tube onto the back end of the Freer Suction Elevator and activate suction by placing a finger over the port.
7. **Assemble the optical retractor**

Insert the endoscope with sheath into the assembled optical retractor.

**Note:** The optical retractor assembly consists of two parts, the Optical Retractor Handle [386.915] which accepts a lighted endoscope with sheath (2.7 mm – 4.0 mm), and a Retractor Blade, available in two widths, 12 mm [386.917] and 17 mm [386.918]. The 12 mm blade is typically used for the submandibular approach, requiring a smaller extraoral incision.

To assemble the retractor, first place the appropriate Retractor Blade into the coupling nut on the Optical Retractor Handle and secure by finger tightening the nut. (Fig. 5A) Then insert the endoscope with sheath into the securing clamp on the Optical Retractor Handle. (Fig. 5B) Position the endoscope so that the preferred view is obtained. Secure by turning the knob. (Fig. 5C)

Attach the optional handle extension to the Optical Retractor Handle for alternate holding positions. (Fig. 5D)

**Note:** To prevent damage to the endoscope, the appropriate sheath must be used.

*Handle extension can be inserted on either side of the handle.*
Exposure and Creation of the Optical Cavity (continued)

8 Place the optical retractor assembly

Insert the hooked tip of the optical retractor assembly with endoscope into the sigmoid notch. Adjust the position of the scope for the best visualization.

Complete dissection of the proximal fragment as necessary for plate placement. Support of the retractor and endoscope can be transferred to an assistant.

Note: Sufficient periosteum must be elevated from the sigmoid notch to allow placement of the optical retractor.
Optional Technique:
The Cheek Retractor Ring, threaded [386.908] when assembled to the 2.0 mm Threaded Cannula may be used as an alternative to the optical retractor assembly. The cannula will also provide a transbuccal portal for drilling and passage of 2.0 mm screws.

Insert the 2.0 mm Cannula and Obturator, threaded, long [386.914] into the Universal Trocar Handle [397.211].

Make a cutaneous puncture for the trocar placement at a point perpendicular to and directly over the subcondylar fracture line. A curved clamp may be inserted into the submandibular incision and the cheek pushed out over the fracture to identify the correct placement of the trocar stab incision.

Note: The patient should not be paralyzed during insertion of the trocar so stimulation to the facial nerve can be identified and the trocar redirected if necessary. Initial spreading dissection with a clamp prior to trocar insertion is helpful.

Insert the cannula and obturator through the stab incision and press down to the bone.

Thread the Cheek Retractor Ring onto the 2.0 mm Cannula, threaded [386.914] using the Fragment Manipulating Forceps [386.912]. Rotate the cannula head clockwise to engage the ring on the threads of the cannula.
Fracture Reduction

Fracture reduction is often the most challenging part of the surgical procedure. Musculoskeletal forces typically drive the ramus superiorly resulting in proximal fragment override. Distracting the mandible inferiorly can significantly aid in reduction. Transverse fractures so reduced may provide sufficient interfragmentary friction to maintain reduction during plating.

1. **Distract the mandible**

Distract the mandible, if necessary. This may be accomplished by placing a straight elevator between the patient's molars and rotating it. Distraction may also be achieved through the submandibular portal, using the Fragment Manipulating Forceps [386.912] to grasp the angle and distract as needed. Release MMF elastic if necessary but reapply after reduction.
1. **Distract the mandible** (continued)

   ![Image of skull diagrams showing distraction process]

   Note: Distraction can also be achieved by passing wire through a predrilled hole at the angle, twisting the free ends, and pulling inferiorly. This reduces the number of instruments through the incision.

2. **Reduce the fracture**

   **Option 1**
   Reduce the laterally displaced proximal fragment by manipulating it medially. Use the obturator tip, Freer elevators, or Fragment Manipulating Forceps to aid reduction.
Fracture Reduction (continued)

2 Reduce the fracture (continued)

Option 2
Use the Subcondylar Elevator, angled right [386.910] or left [386.911] to laterally reduce a medially displaced fragment.

Option 3
Reduction can also be achieved by using the Threaded Fragment Manipulator [386.902] with the Fragment Manipulator Handle [386.903].

First insert the 2.0 mm Cannula and Obturator, self-retaining [386.904] through a trocar incision at a suitable location superior to the fracture line, where the top plate hole will be located. Remove the obturator and insert the Threaded Fragment Manipulator through the self-retaining 2.0 mm Cannula.

Note: The patient should not be paralyzed during insertion of the trocar so stimulation to the facial nerve can be identified and the trocar redirected if necessary. Initial spreading dissection with a clamp prior to trocar insertion is helpful.
2. **Reduce the fracture** (continued)

The Threaded Fragment Manipulator is self-drilling and must be fully inserted into the proximal fragment using the screwdriver Handle, with mini quick coupling [311.01.98].

*Note*: *This device should be used only in healthy bone in an area with adequate bone stock to prevent splitting the bony margins.*

Prior to manipulation of the bone, replace the screwdriver handle with the lightweight Fragment Manipulator Handle for manipulation and reduction of the proximal fragment.

*CAUTION*: *If the screwdriver handle is not replaced, loss of reduction and bending of the Threaded Fragment Manipulator may occur.*

Gently manipulate the fracture fragment until reduction is achieved.

*Note*: *See Step 3, page 36, for use of the Threaded Fragment Manipulator in conjunction with a plate.*

Threaded Fragment Manipulator 386.902

Use 311.01.98 handle for **insertion** of 386.902

Use 386.903 handle for **manipulation** of fragment with 386.902
Fracture Fixation

Stable fracture fixation may be achieved using a 2.0 mm Dynamic Compression Plate affixed with a minimum of two screws, but preferably three screws, on either side of the fracture.

1 Load plate onto Articulating Plate Introducer

Load the desired 2.0 mm plate onto the flexible Plate Holding Tip of the Articulating Plate Introducer [386.900] by first ensuring that the “U” (unlocked position) on the retention fastener is aligned with the arrow on the Plate Holding Tip. The cruciform 1.5 mm/2.0 mm Screwdriver Blade [313.923] with the Handle, with mini quick coupling, may be used to achieve alignment if necessary.

Turn the Plate Holding Tip so the cruciform retention fastener faces downward. Turn the selected Dynamic Compression Plate over to view the underside of the plate (the beveled edges of the DCP holes are not visible). Assemble the plate to the Plate Holding Tip by placing an end hole over the post on the back of the Plate Holding Tip and pressing it into place.

Turn the plate and holder over so that the retention fastener faces up. Secure the plate to the Plate Holding Tip, using the cruciform screwdriver blade. Turn the retention fastener clockwise 1/4 turn, so the arrow points to the “L” (locked) position.

Turn retention fastener 1/4 turn clockwise to lock plate into place.
1 Load plate onto Articulating Plate Introducer (continued)

The plate may now be angulated left or right, as needed, by sliding the two-part grooved handle of the Articulating Plate Introducer between the thumb and forefinger.

2 Position and contour the plate

Insert the Articulating Plate Introducer (with plate attached) through the submandibular incision and angulate the plate in the desired orientation. Position the plate along the posterior border of the mandible, allowing for a minimum of two screws to be placed on either side of the fracture. Three screws on either side of the fracture are optimal.

Once the plate is in the proper position over the fracture, evaluate any need for contouring. Remove the introducer and plate, and contour the plate as needed to match the anatomy. Reinsert the plate and confirm that the contouring and the reduction are adequate.

The Angled Hook [386.905] may also be used to assist in positioning the plate.
Fracture Fixation (continued)

3 Temporarily fix the plate using the Threaded Fragment Manipulator

When the Threaded Fragment Manipulator is used for temporary plate fixation, it must be inserted into the proximal fragment using the screwdriver Handle, with mini quick coupling.

Insert the Threaded Fragment Manipulator through the cannula into the most superior plate hole, and thread into the bone. The fragment manipulator must be fully inserted against the plate before manipulation of the fragment.

**Note:** This device should only be used in healthy bone with adequate bone stock to prevent splitting the bony margins.

Replace the screwdriver handle with the Fragment Manipulator Handle [386.903] prior to manipulating fragment.
4 Drill first screw hole and place screw

Place the 1.5 mm Insert Drill Guide, long [386.913] through the 2.0 mm Threaded Cannula [386.914] and position the tip into the plate hole just distal to the fracture. Drill with the 1.5 mm Drill Bit [317.835]. Remove the drill guide and insert the appropriate length 2.0 mm screw.

Note: Low-profile, right-angled drills can be used in this application.

5 Drill and insert remaining screws

Insert the next screw into the plate hole just proximal to the fracture. Insert screws into all remaining visible plate holes. The sequence in Figure 1 is recommended.

Figure 1
Fracture Fixation (continued)

6  Remove the Articulating Plate Introducer
Remove the Articulating Plate Introducer from the plate by turning the retention fastener 1/4 turn counterclockwise, to the “U” (unlocked position).

7  Drill and insert screw
Drill for the remaining distal hole and insert the appropriate length 2.0 mm screw.
8 Remove Threaded Fragment Manipulator and insert screw

Remove the Threaded Fragment Manipulator and insert the appropriate length 2.4 mm emergency screw through the 2.0 mm cannula and into the hole created by the Threaded Fragment Manipulator.

Note: The Threaded Fragment Manipulator is single use only and should be discarded after use.

9 Confirm reduction

Confirm proper reduction and inspect the anterior and posterior border of the fracture through the endoscope.
Subcondylar/Ramus Fixation Set
[115.680]

690.600 Subcondylar/Ramus Fixation Set
Graphic Case
304.679 2.0 mm Compact Fixation Module

Instruments

311.01.98 Handle, with mini quick coupling
313.923 1.5 mm/2.0 mm Screwdriver Blade, self-retaining, wedge, long, 2 ea.
317.835 1.5 mm Drill Bit, Stryker J-latch, 110 mm, 2 ea.
319.27 2.1 mm Cleaning Brush
321.17 4.5 mm Pin Wrench, 120 mm
347.98 Plate Holding Forceps, for 1.5 mm, 2.0 mm and 2.4 mm plates
386.900 Articulating Plate Introducer with Plate Holding Tip
386.901 Plate Holding Tip for Articulating Plate Introducer
386.902 Fragment Manipulator, Threaded, 1.9 mm, self-drilling, 2 ea.
386.903 Fragment Manipulator Handle
386.904 2.0 mm Cannula and Obturator, self-retaining
386.905 Hook, angled, 1.5 mm flat tip
386.906 Freer Suction Elevator and 1.8 mm Cleaning Stylet
386.908 Cheek Retractor Ring, threaded
386.910 Subcondylar Elevator, angled right
386.911 Subcondylar Elevator, angled left
386.912 Fragment Manipulating Forceps
386.913 1.5 mm Insert Drill Guide, long
386.914 2.0 mm Cannula and Obturator, threaded, long
386.915 Optical Retractor Handle
386.917 Retractor Blade, 12 mm width
386.918 Retractor Blade, 17 mm width
386.920 Retractor, 8 mm x 60 mm
397.211 Universal Trocar Handle
398.415 Double Ended Elevator, straight, 240 mm
398.415 Double Ended Elevator, 20 cm, size 1

Also Available

304.106—118 Screw Length Markers, 6 mm–18 mm (10/pkg.)
313.843 2.0 mm Screwdriver Blade, self-retaining, StarDrive, long
319.007 Depth Gauge, for 2.0 mm and 2.4 mm screws, long
386.907 1.8 mm Cleaning Stylet
Suggested Reading List


