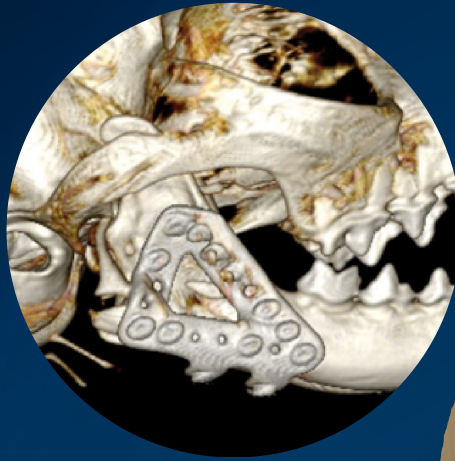


Fusion Implants

Advanced Veterinary Devices



RAP

RAMUS ANATOMIC PLATE

SURGICAL PROTOCOL

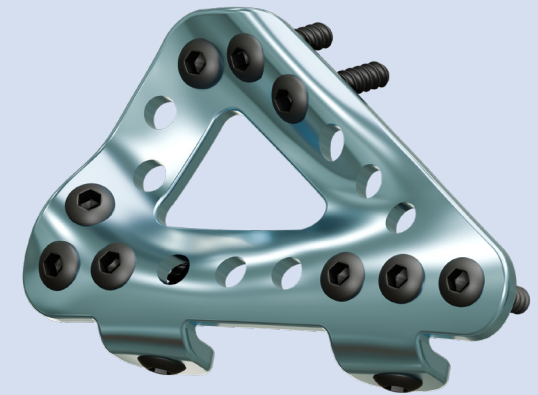


1. Surgical Approach

- If multiple mandibular fractures are present:
 - Work caudal to rostral for reconstruction, &/or
 - Start with the simplest fracture first.
- Perform a ventrolateral curvilinear skin incision access the mandible, beginning at the mid mandibular body, terminating dorsal to the angular process.
- Dissect through the platysma.
- Separate between masseter and digastricus muscles.
- Elevate masseter from its fossa (perform masseterotomy if required).
- Reduce fracture fragments:
 - True anatomic reduction preferred.
 - If not possible, achieve functional occlusion (consider plastic deformation).
- Exercise care manipulating fragments involving the condyle, luxation is possible.

RAP Osteosynthesis

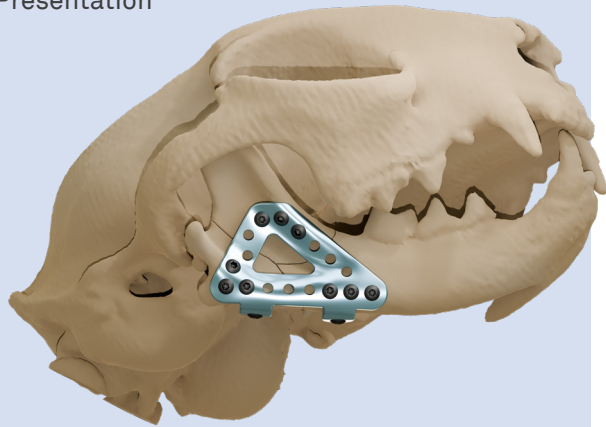
- Identify appropriate plate size (our Fusion Implants engineers can template the sizes to your CT scan to aid in choosing the optimal size)
- Minimal/no contouring may be required
- Fix rostral segment first (easiest landmark), seating the plate rostrally into the mandibular fossa and ventrally using the orthogonal screw tab.
- Employ orthogonal screw placement where indicated.
- Use the plate as a de facto jig.
- Clamp loose fragments to the plate prior to fixation.
- Determine and apply appropriate screw numbers



2. Plating Technique

General Principles

- The plate is designed to be used with non-locking screws.
Fusion has designed RAP specific low profile cortical screws to be used with this implant
- Plate functions as a jig:
 - Clamp fragments to the plate.
 - Screw tightening brings the bone to the plate
 - RAP Presentation



Stepwise Fixation

1. Rostral Fragment Fixation

- Apply plate to ventral aspect of rostral fragment first.
- Hold plate with pointed reduction forceps.
- Ensure plate does not rotate ventrally (avoid lateral displacement of ramus or zygoma impingement).
- Apply lateral-to-medial screw in rostral fragment

2. Articular Process Segment

- Secure articular process segment
- Check alignment of ventral mandible.
- Confirm overall mandibular shape, occlusion, and TMJ range of motion.
- Secure with a minimum of two screws

3. Ramus Section

- Secure ramus section to the plate.
- If fragment displaced medially:
 - Use threaded pins (center of plate).
 - Apply periosteal elevator at the rostral margin to retract.
 - Assistant applies counter-traction during drilling and screw placement.
- Prevents fragment from “drifting away”

4. Remaining Holes

- Fill additional holes as needed.
- Aim for 3 screws per fragment:
 - 2 adequate.
 - 1 tenuous

Technical Considerations

Self-Tapping Screws

- 1.5 mm screws require a 1.1 mm drill bit.
- Screw tip has cutting flutes → cuts bone threads during tightening.
- May need to pre-tap hole if insertion difficult or first screw in segment.

Avoiding Stripped Threads

- Stripping occurs if bone thread is lost → screw won't tighten, plate not secure.
- Avoid by:
 - Keeping the driver coaxial with the drill hole.
 - Applying axial pressure as the screw advances.
 - Using finger and thumb to tighten.
 - Adjusting strength to bone thickness

If Threads Strip

- If fragment is reduced but screw insecure:
 - Place other screws first.
 - Use alternate holes if available.
 - Remove the stripped screw.
 - If necessary, insert a larger "rescue" screw

Drill Bits

- Drill bits prone to bending or snapping.
- Use high speed, low pressure.
- Replace bent or blunt drills.
- Keep 2–5 spare bits available.
- Ensure drill hole is centered within plate hole

Depth Gauge

- Use depth gauge to measure screw length:
 - Pass thin end through drill hole.
 - Hook engages the opposite cortex.
 - Bring gauge to plate and read screw length.
- Pre-measuring on CT may be useful

Screw Hole Selection

- Aim to use holes over the thickest bone.
- Ensure the drill hole is centered.
- Avoid over-tightening screws.
- Thin mandibular bone may engage only 1–2 threads

3. Post-operative Outcomes

- Feeding: Soft can be offered immediately post operatively when appropriate
- Diversionary feeding via oesophagostomy tube is advisable for initial post-operative period.

