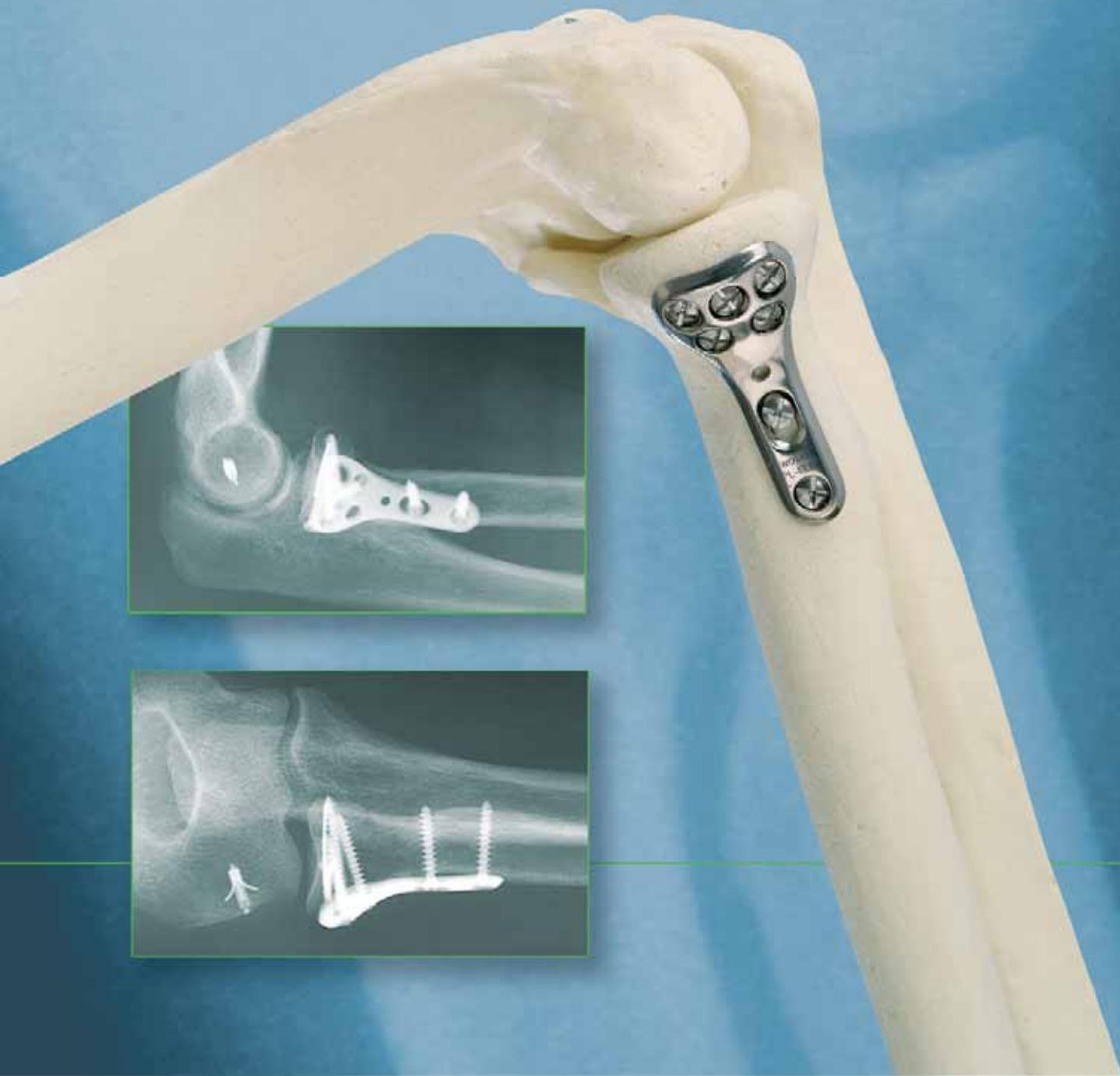


A&U MED[®]



Mayo Clinic

CONGRUENT RADIAL HEAD PLATE

Since 1988 Acumed has been designing solutions to the demanding situations facing orthopedic surgeons, hospitals and their patients. Our strategy has been to know the indication, design a solution to fit, and deliver quality products and instruments.

By incorporating a principle-based fixation technique to guide the application of pre-contoured plates, Shawn O'Driscoll, Ph.D., M.D. has designed the Mayo Clinic Radial Head Plate to advance the treatment of radial head fractures.

The radial head plate is an extension of the Mayo Clinic Congruent Elbow Plate System, and incorporates a series of technical objectives to maximize fixation in the radial head.

The Radial Head Plate System is contained in a compact, stand-alone tray that contains the screws and instrumentation necessary for surgery.



Designed for elbow fractures where the radial head is salvageable, but traditional fixation is inadequate, the Mayo Clinic Congruent Radial Head Plate continues the tradition of principle-based internal fixation.

The screws allow varying angles of placement with a low-profile screw/plate interface. Increased angulation permits screw interdigitation creating a stable, fixed-angle configuration. Offering up to five 2.1mm or 2.7mm screws into the radial head, the pre-contoured plate anchors securely with-

in the "safe zone" of the radial head enabling proper forearm rotation.



Technical Objectives for Radial Head Plates:

1. Every screw in the radial head should pass through a plate.
2. Place as many screws as possible in the radial head.
3. Each screw should be as long as possible.
4. Each screw should engage as many articular fragments as possible.
5. The screws should lock together by interdigitation, creating a "fixed-angle" structure.
6. The plate should be strong and stiff enough not to bend or break.

Stable Fixation

Milled from solid titanium, the anatomical plate design is complemented by having multiple proximal screw holes to capture and hold the radial head fragments. The plate fits within the “safe zone” of the radial head with little or no bending. Both 2.1mm and 2.7mm screws are available in lengths up to 28mm for maximum holding power.



Screw Angulation

Screw holes are recessed to allow for greater screw angulation while maintaining a flush screw/plate interface. Increased angulation permits screw interdigitation creating a stable, fixed-angle configuration. Plate is highly polished with beveled edges to minimize soft tissue irritation.



Provisional Fixation

The Mayo Clinic Radial Head Plate features a Plate Tack hole for provisional fixation, providing a means to hold the plate in place while inserting the initial screws.

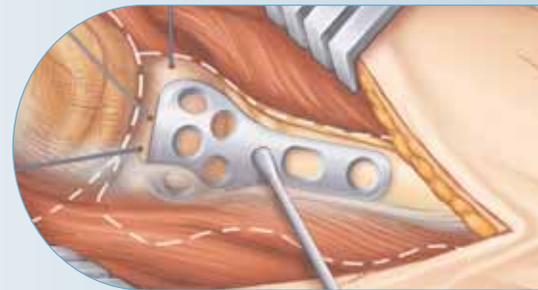
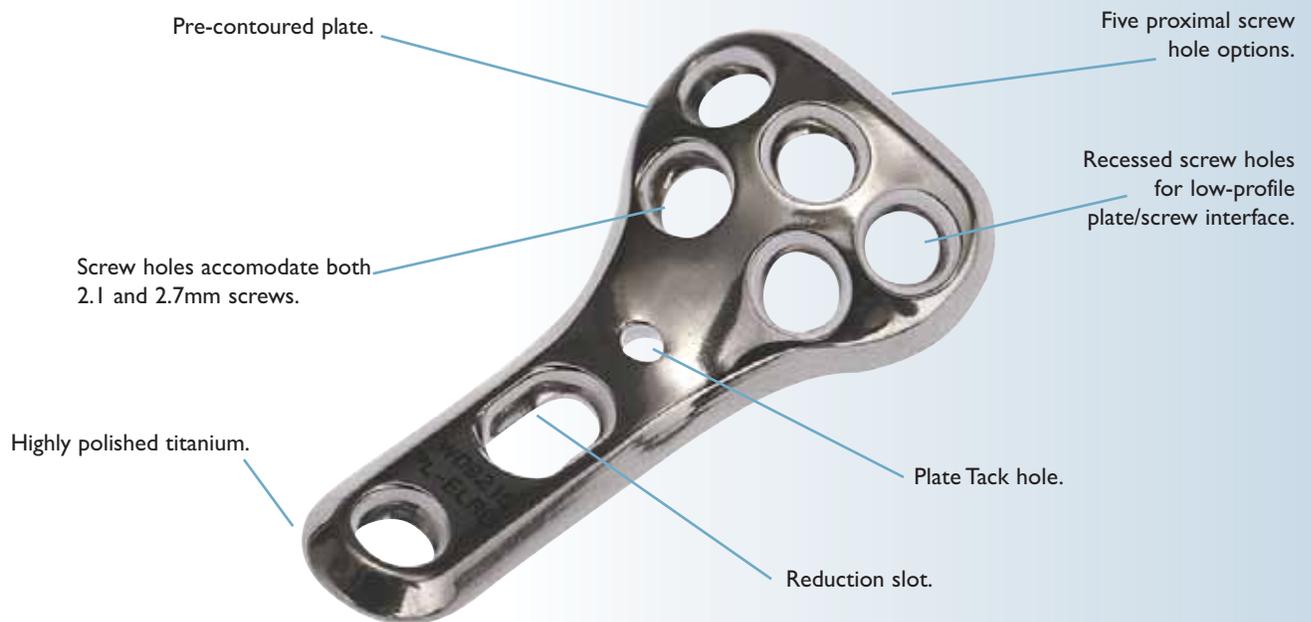


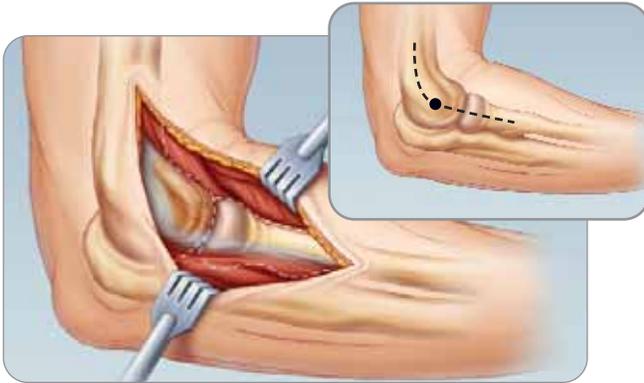
Plate is applied in the “safe zone” of the radial head to ensure proper forearm rotation.



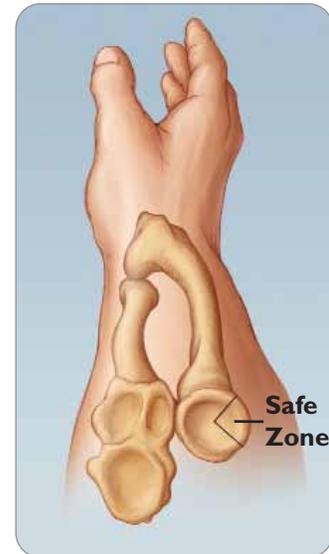
SURGICAL TECHNIQUE

Radial Head Plate by Shawn O'Driscoll, MD PhD

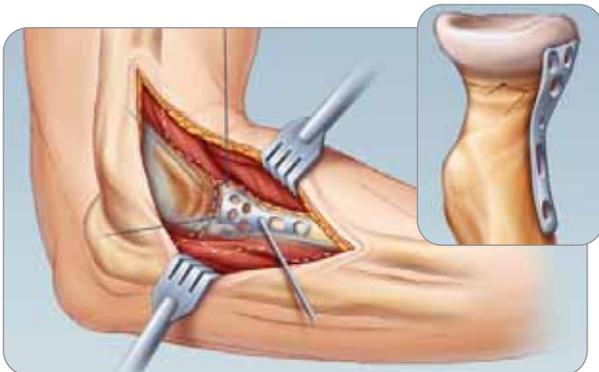
This section offers Acumed's suggested method for implanting the Radial Head Plate from the Mayo Clinic Congruent Elbow Plate System. For specific questions not addressed here, please contact your local Acumed representative or Acumed by phone at (888) 627-9957 or on the web at www.acumed.net.



1) Exposure for radial head ORIF is through the Kaplan interval in a line from the lateral epicondyle toward Lister's tubercle, with the forearm in neutral rotation. The tendon is split for 3 to 4cm distal to the epicondyle, with the distal extent limited by the posterior interosseous nerve. Proximally, the ECRL origin is released with the anterior capsule to permit direct access to the front of the radial head.



2) The plate is placed on the "safe zone" on the radial head. With the forearm in neutral rotation, the safe zone includes a 90° angle centered laterally, plus 20° anterior to this. A simplification is to place the plate directly lateral with the forearm in 10° supination.



3) Articular reduction is performed and provisionally held with K-wires placed to avoid the plate, which is designed to sit approximately half way onto the annular surface of the radial head. This lessens the risk of screw penetration of the head that would occur with more proximal placement. After placing the plate on the radius, it is provisionally held with a Plate Tack (PL-PTACK) through the K-Wire hole. It is then rigidly fixed to the shaft with a screw through the slotted hole **F**, which allows for a slight adjustment in position of the plate.

Note: Screw length is determined using the calibrated drills and drill guide. The depth gauge from the Congruent Plate System may be used for the 2.7 mm diameter screws.



4) Next, a screw is inserted into hole **B**. The screw should be placed parallel to the articular surface and without violating the far cortex or subchondral bone. Once the plate is securely positioned against the head and neck, the remaining holes can be filled with screws. The holes for these screws are drilled using the drill guide. In holes **A** and **C**, it may be necessary to vary the angle significantly in order to fix smaller fragments with screws to the plate. While screws inserted into holes **D** and **E** may enter the fracture site near the plate, they are directed upwards into the head fragment. These screws not only secure the fragment, but buttress the screws above them in the fragment.

Note: In hard bone, tapping may be needed.



5) Finally, a screw is placed in hole **G**. The K-wires are removed after adding any additional screws through the articular surface fragments that have not been fixed with screws through the plate. The proximal radial ulnar joint is tested for smooth motion and the remainder of the articular and annular surfaces are inspected to be sure that no hardware penetration has occurred. Intraoperative fluoroscopic examination with the image intensifier is used also to confirm proper positioning of hardware without evidence of articular impingement against the ulnar or capitellum. The annular ligament is carefully repaired and the ECR/ECRL origins are reattached.

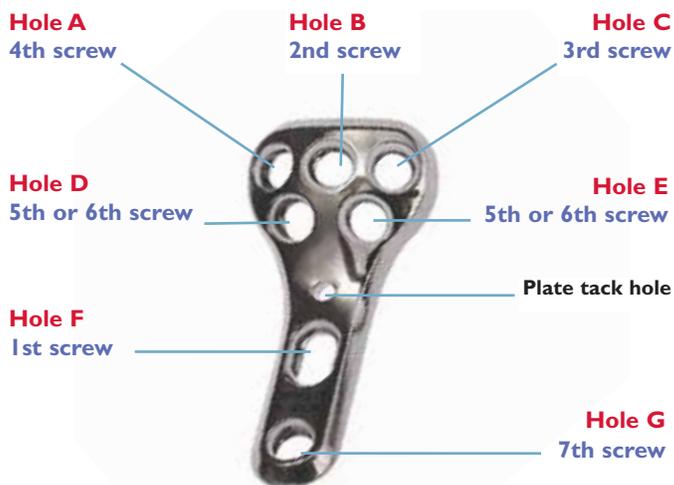
Bone grafting is necessary to fill voids under the head. It can be performed early in the procedure or after hardware placement, depending on whether bone grafting is being performed for structural support on the medial cortex or to simply fill a gap that does not create a loss of structural support.



Postop Protocol:

Postoperatively, the management is determined by the overall management of the elbow and limb, more so than specifically the radial head. For isolated fractures of the radial head and neck, without ligament injury, early motion is commenced in flexion and extension as well as pronation and supination. This usually occurs within one to two days of surgery. Start within 36 hours of surgery.

Screw Insertion Order



Screw Angulation



The anatomical plate fits within the safe zone of the radial head with little or no bending.



Depending on which hole is used, Screws may be angled to secure fragments in the radial head.



ACUMED®
5885 NW Cornelius Pass Road
Hillsboro, OR 97124
888 627-9957
www.acumed.net

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