Smith+Nephew

KATALYST

Bipolar Radial Head System

Surgical Technique

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Nota Bena:

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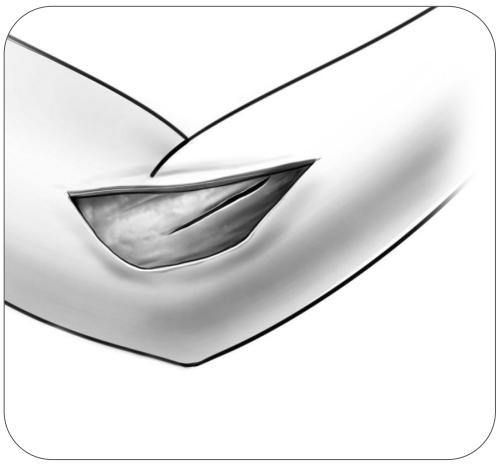


Figure 1-1

Figure 2-1

Step 1 ▪ Assessment of elbow stability

1-1 Valgus stability, posterolateral stability and longitudinal stability are determined using commonly accepted practices such as preoperative radiographs, intraoperative inspection, and stress radiographs.

Surgical approach

After the skin incision is performed **(Figure 1-1)**, the radial head is exposed via a modified lateral approach designed to preserve the lateral ulnar collateral ligament and the posterior half of the radial collateral ligament.

The approach splits the thick common extensor tendon origin in the midline of the radiocapitellar axis.

Step 2 ▪ Exposure

2-1 The appropriate plane can be identified by palpating the lateral condylar ridge and radial head.

A full-thickness incision is made through the common tendon and ligament origin along the longitudinal axis of the radial head and neck **(Figure 2-1)**. This is commonly through the center of the white common extensor tendon.

The origin of the radial wrist extensors and the joint capsule may be elevated from the anterolateral aspect of the distal humerus as needed for exposure. Proximal extension is carried out anterior to the lateral epicondyle.

The split of the lateral complex distally extends to the metaphysis of the radial neck. In the atraumatic setting, the exposure can be performed without destabilizing the elbow since the posterior half of the extensor origin and lateral ligament complex remain intact.

Note: When the radial head has fractured in association with a dislocation of the elbow, the lateral complex will often be stripped from its origin on the lateral epicondyle. This should be noted during the exposure, and a plan should be formulated to repair or reconstruct the ligament complex at the end of the case.

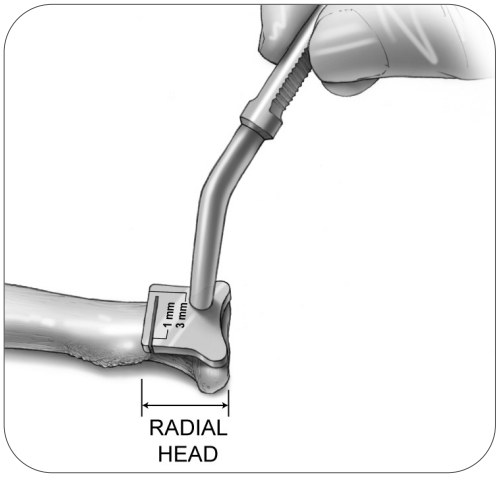


Figure 3-1

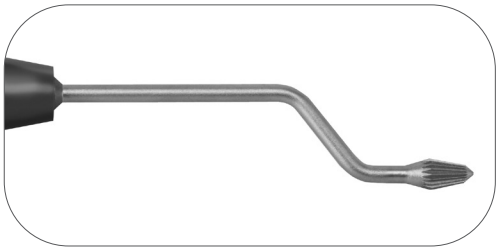


Figure 4-1

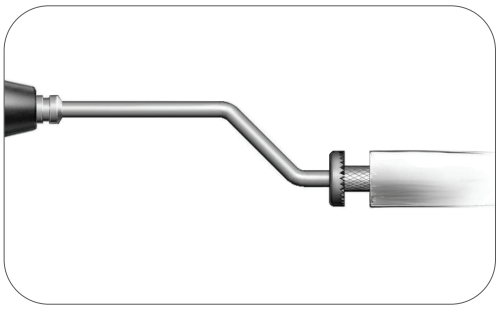


Figure 5-1

Figure 6-1

Step 3 ▪ Radial head resection

3-1 Radial head resection at the proximal articular margin at this level will prevent impingement between the cut end of the proximal radius and the sigmoid notch.

The appropriate level of resection can be determined by using the Cutting Template **(Figure 3-1)**; this corresponds with the resection of the head using the 1mm First Spacer.

Note: Once the cut in the neck is made, measure the distance from the coronoid to the cut edge of the proximal radius and re-create that distance with the head and neck (see Step 7).

Step 4 ▪ Opening intramedullary canal

4-1 The Starter Awl is used to open the intramedullary canal of the proximal canal. **(Figure 4-1)**

Step 5 ▪ Broaching

5-1 The combination Broach with End Cutting Mill is used to create a smooth cut end of the proximal radius with a reamed intramedullary canal that is perpendicular to the long axis of the radius **(Figure 5-1)**.

It is recommended to start with the 6.5mm Broach prior to using the 7.5mm Broach.

Step 6 ▪ Choosing trial head

6-1 Once the canal is broached up to the appropriate size, the corresponding Trial Stem is placed into the intramedullary canal with the black line on the side of the trial stem facing the surgeon.

The Broaches and trial stems are color coded for convenience.

The appropriate diameter Trial Head is chosen based on pre-operative templating and/or reassembly of the fracture components using the Head Sizing Fixture as a template **(Figure 6-1)**.

In cases where there is a question between 2 head sizes, the smaller implant is chosen. Care must be taken to use the smallest diameter of the resected native radial head for measurement purposes to avoid placing too large an implant.

Step 7 ▪ Final evaluation of size and length

7-1 Templates of the actual head sizes and lengths at the 1mm and the 3mm positions are used to document proper sizing.

Head circumferences can be checked by seating the trial into the joint against the radial or sigmoid notch of the ulna. The concavity of the head should match the convexity of the capitellum when the trial is seated against the sigmoid notch of the ulna.

Length of the radial head implant is determined by first making sure that the ulnohumeral joint is properly reduced, typically by looking at the lateral aspect of the ulnohumeral joint (the coronoid should sit flush with the trochlea). The forearm can be placed in neutral rotation for this purpose. The chosen size head circumference and length (1mm or 3mm position) should slide into the space between the cut end of the radial neck and the capitellum without significant force. This documents the appropriate radial neck resection for the length of the replacement.

Determining the appropriate separation in the head-neck construct is more difficult when the lateral complex has torn. This can be accomplished by using the method above, taking care to ensure that the ulnohumeral joint is reduced. A provisional reduction of the tendon and ligament origin to the humerus with the ulnohumeral joint reduced (by flexion and pronation of the forearm) can also be performed.

The proximal margin of the implant should line up with the articular surface of the coronoid when viewed from the lateral side.

Note: The forearm must be in 90° of flexion and at full pronation when determining the appropriate tension via the spacer forks.

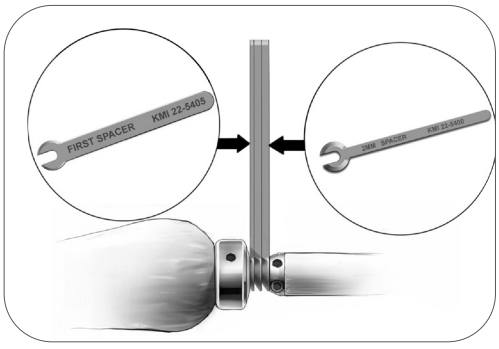


Figure 8-1

Step 8 ▪ Using spacers to adjust seperation

8-1 Once the Trial Head is snapped in place on the stem, the two components are extended to re-create the appropriate distance from the coronoid, to the edge of the proximal radius as determined in Step 3.

This separation is achieved by inserting the First Spacer which will position the implant in the first extended position. For each additional extension required, 2mm Spacers are used.

Step 9 ▪ Locking the stem

9-1 Once the appropriate tension is achieved, the Trial Stem is locked in place by turning the Set Screw in a clockwise fashion for 3/4 of a turn **(Figure 9-1)**.

Note: The set screw in the trial is captured in place and cannot be removed.

Figure 9-1

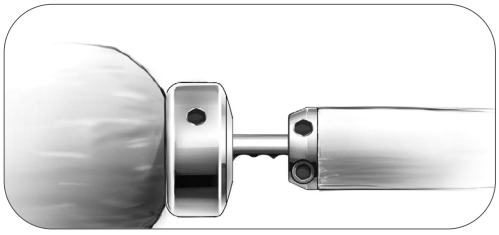


Figure 10-1a

Figure 10-1b

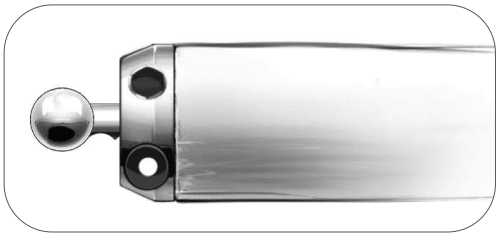


Figure 11-1

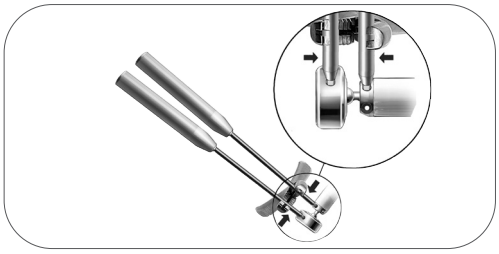


Figure 12-1

Step 10 ▪ Implant alignment

10-1 Intraoperative radiographs may be used to confirm appropriate size and position of the implant.

The stem should be aligned with the longitudinal axis of the radius. The head should match the capitellum and seat in a congruent fashion against the sigmoid notch.

The medial joint space of the ulnohumeral articulation should be symmetrical and not converge on the anteroposterior projection **(Figure 10-1a)**; if so, the elbow may have been forced into a valgus position by an "overstuffed" implant **(Figure 10-1b)**.

The lateral ulnohumeral joint space may be slightly divergent. Comparison radiographs help define the appropriate alignment of implant and the joint. Note that joint spaces can not be adequately assessed unless the AP radiograph is performed with the elbow fully extended.

Move the elbow through a full arc of flexion and forearm rotation. A lack of motion, particularly flexion, may be additional evidence of an oversized or over-distracted trial implant.

Step 11 ▪ Stem insertion

11-1 The Trial Implant is removed and the Permanent Implant of the same size is placed. Prior to placing the Stem in the surgical field, the Set Screw is removed from the side of the Stem. The Stem is fully inserted into the canal, again ensuring that the black line on the implant faces the surgeon **(Figure 11-1)**.

Step 12 ▪ Attaching radial head

12-1 The appropriate sized Head is placed over the spherical end of the Stem. There is a hex feature on both the Head and the Stem. By placing one Hex Driver in each of these two holes and pinching the two Hex Drivers together, the Head will snap in place on the stem **(Figure 12-1)**. The Hex Driver handle should be parallel with each other in order to ensure proper engagement.

Pliers are provided to assist with pinching the two drivers together when snapping the Head onto the Stem.

Note: Do Not Disassemble. Once the head has been assembled to the stem, disassembly and reassembly of the same components will adversely affect retention strength between them and is not recommended unless the surgeon decides that the choice of head size was improper.

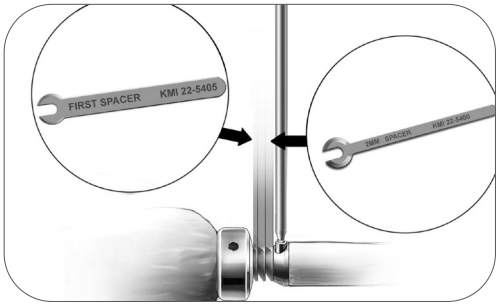


Figure 13-1

Step 13 ▪ Set screw locking

13-1 Once in the correct position by use of the spacers **(Figure 13-1)**, the Set Screw is placed back into the stem, taking care not to over-torque the screw.

Finally, the Spacers are removed from the implant.

Repeat radiographs and intra-operative stress testing are now performed.

Step 14 ▪ Repair of the lateral complex

14-1 If the posterior half of the lateral complex is intact, the anterior half is repaired to the intact posterior limb.

If the lateral complex was avulsed or released, it is repaired to the lateral epicondyle. The skin is closed and the elbow is placed in a posterior splint.

Step 15 ▪ Final radiograph

15-1 In cases of unstable elbow fracture dislocations it is recommended that a lateral radiograph of the splinted elbow be obtained in the operating room before the patient is awakened to ensure that a concentric reduction of the elbow has been maintained.

Post-operative care

16-1 Elbow motion and forearm rotation are begun in the early postoperative period. Rehabilitation is guided by intraoperative stability. Serial follow-up radiographs should be examined for evidence of implant malposition or wear. Sclerosis in the bone at the implant-bone interface is evidence of appropriate load transfer through the implant.

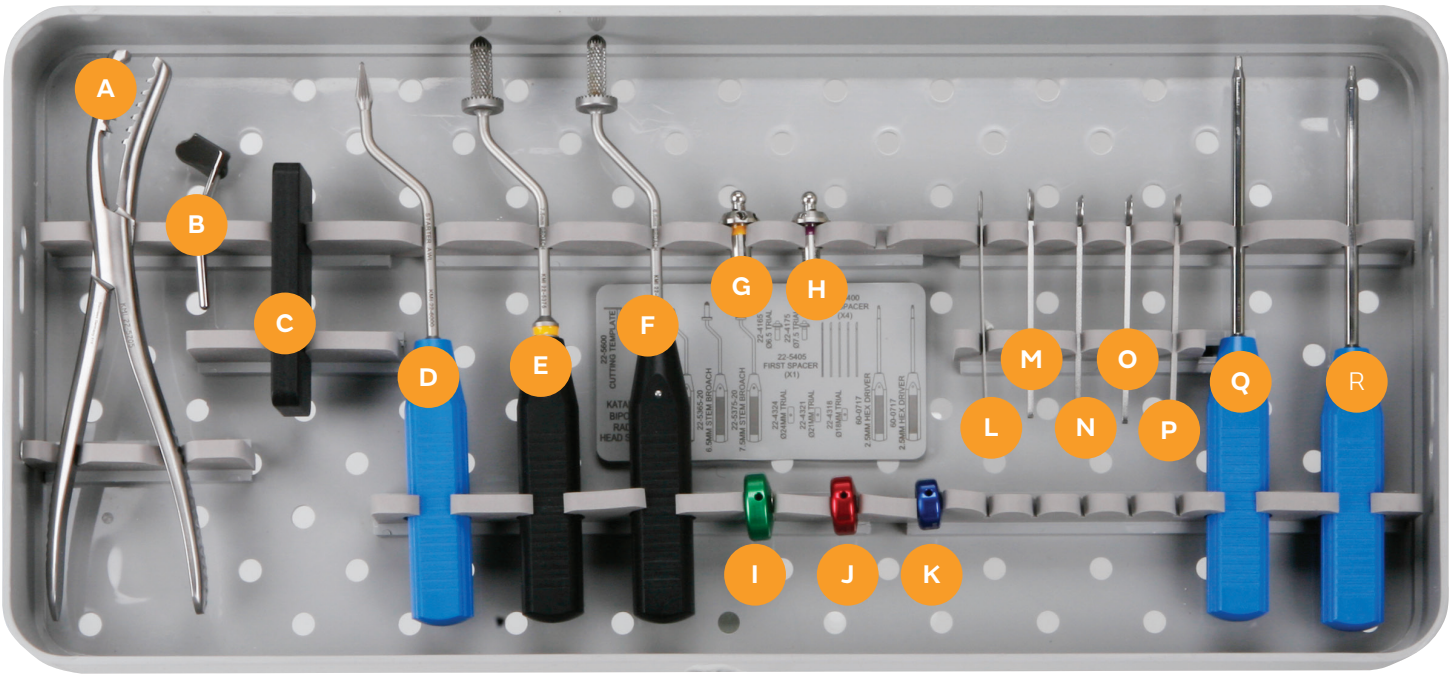
Note: Revision Or Removal. To disengage the head from the stem, place one hex driver in the head component and a second hex driver in the stem component and lever the hex driver in the head away from the driver in the stem until the head is disassembled. Reusing a head component that has been previously assembled to a stem is not recommended as the retention force will be compromised.

Product information

Implants

Catalog Number	Description	Size
221418	KATALYST Head	18mm
221421	KATALYST Head	21mm
221424	KATALYST Head	24mm
221665	KATALYST Stem	6.5mm
221675	KATALYST Stem	7.5mm

Instrumentation



Instruments

Catalog Number	Description	Size	Item
225205KMI	KATALYST Pliers		**A**
225600	Cutting Template		**B**
225900	Head Sizing Template		**C**
226000	Starter Awl		**D**
225375	Broach Long	7.5mm	**E**
225365	Broach Long	6.5mm	**F**
224175	Trial Stem Shaft	7.5mm	**G**
224165	Trial Stem Shaft	6.5mm	**H**
224324	KATALYST Trial Head	24mm	**I**
224321	KATALYST Trial Head	21mm	**J**
224318	KATALYST Trial Head	18mm	**K**
225405KMI	First Spacer		**L**
225400KMI	Spacer	2mm	**M, N, O, P**
600717	2.5 Hex Driver		**Q, R,**

Complete Instrument Set

Catalog Number	Description
225000	KATALYST Instrument Set
221001	KATALYST Case Base and Lid

Component Materials

- Head and poly Assembly: Cobalt Chrome with polyethylene liner
- Stem Assembly: Stainless Steel

Surgical Technique

S+N does not provide medical advice and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.

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Manufacturer:

Smith & Nephew, Inc.
1450 Brooks Road
Memphis, TN 38116 ▪ USA