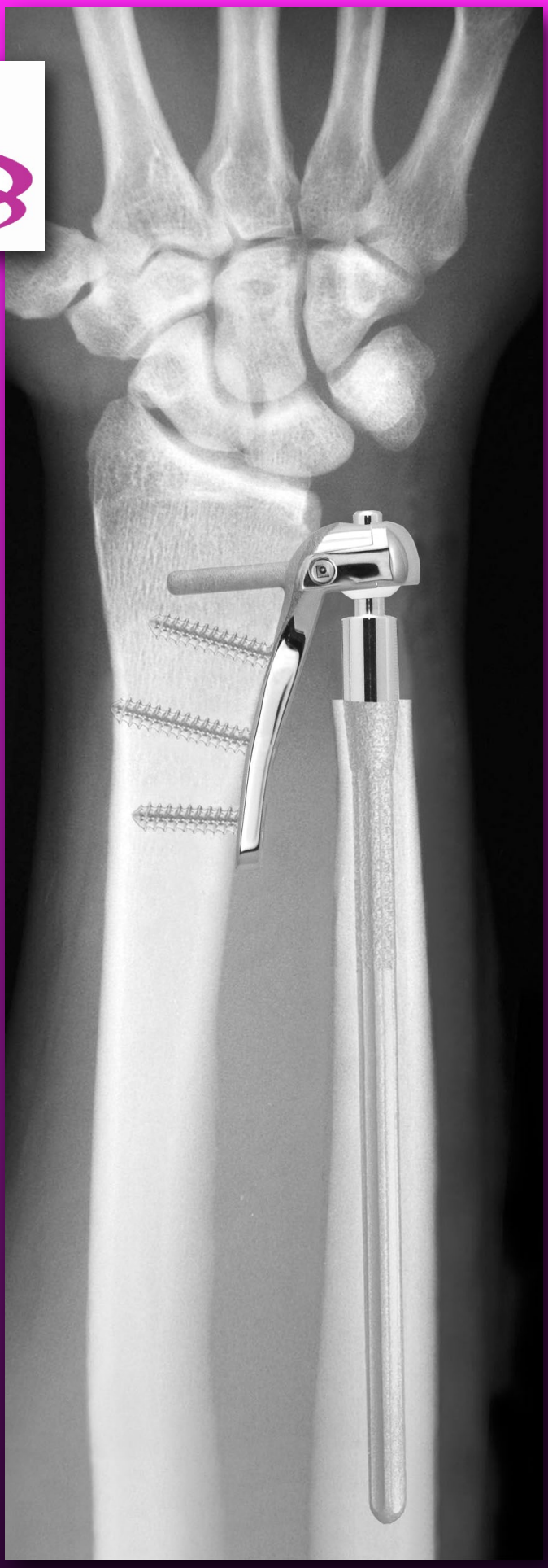
APTIS

*Putting Ideas in Motion*

# The Scheker Distal Radio-Ulnar Joint Prosthesis

## Technique Guide

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# GENERAL PRECAUTIONS

All surgical procedures and techniques are the responsibility of the medical professional. The surgeon, based on personal medical training and experience, must evaluate the procedure for appropriateness. No one technique is suitable for all patients.

# INDICATIONS FOR USE

Aptis Medical Distal Radio Ulnar Joint implant is intended for replacement of the distal radioulnar joint following ulnar head resection arthroplasty:

Replacement of the distal radio-ulnar head for rheumatoid, degenerative, or post-traumatic arthritis presenting with the following findings:

- Pain and weakness of the wrist joint not improved by non-operative treatment
- Instability of the ulna head with radiographic evidence of dislocation
- or erosive changes of the distal radio-ulnar joint
- Failed ulna head resection; e.g. Darrach resection
- Primary replacement after fracture of the ulna head or neck.
- Revision following failed ulna head arthroplasty.

This prosthesis is intended for single use only.

# CONTRAINDICATIONS

- Bone, musculature, tendons or adjacent soft tissue compromised by disease, infection or prior implantation which can not provide adequate support or fixation for the prosthesis.
- Skeletal Immaturity
- Active or suspected infection in or around the joint
- Known sensitivity to materials used in the device
- Possibility for conservative treatment.

# WARNINGS (See also the Patient Counseling Information)

Patients should be made aware of the increased potential for device failure when excessive demands are made upon it. Strenuous loading, excessive mobility, and articular instability all may lead to accelerated wear and eventual failure by loosening, fracture, or dislocation of the device.

Patients should be cautioned to not lift loads of 20 lbs or greater. Doing so may result in device failure.

See product insert for additional information including adverse effects, cautions, warnings and MRI.

## PATIENT COUNSELING INFORMATION (See also warnings)

In addition to the patient related information contained in the Warnings and Adverse Events sections of the IFU, the following information should be conveyed to the patient:

*While the expected life of total joint replacement components is difficult to estimate, it is finite. These components are made of foreign materials, which are placed within the body for the potential restoration of mobility or reduction of pain. However, due to the many biological, mechanical and physiochemical factors which affect these devices, the components cannot be expected to withstand the activity level and loads of normal healthy bone for an unlimited period of time.*

Adverse effects of this device may necessitate re-operation, revision, or fusion of the involved joint.

## SURGICAL PROCEDURES

A manual is available describing detailed surgical procedures for use of these implant devices. It is the responsibility of the surgeon to be familiar with the procedure before use of these products. In addition, it is the responsibility of the surgeon to be familiar with relevant publications and consult with experienced associates regarding the implant procedures before use.

## Please see the package insert, Information for use (IFU), for additional information.

# DISTAL RADIO-ULNAR JOINT PROSTHESIS AND INSTRUMENTATION

The prosthesis consists of a radial plate, an ulnar stem, an Ultra-High-Molecular-Weight Polyethylene (UHMWP) ball, a radial plate cover and one locking cross pin.

The radial plate replaces the function of the sigmoid notch.

The ulnar stem and ball combination replaces the function of the ulnar head.

The radial plate cover and locking cross pin replace the function of the Triangular Fibrocartilage Complex (TFC).


The Instrument Set is organized in an easy to follow manner and contains the following;

- Three radial plate trials (size 10, size 20, size 30) (two shown)
- One radial peg drill bit
- One 2.5 mm drill guide
- One 2.5 mm drill bit
- One depth gauge for screw length reference
- One quick connect handle for 3.5 mm tap
- One 3.5 mm tap
- One quick connect handle with a 2.5 mm hex driver for 3.5 mm screws
- One ulnar resection level reference guide
- Two guide wires, one blunt, one sharp
- One threaded trial handle / locking screw drill guide
- Four cannulated drill bits (4.0 mm, 4.5 mm, 5.0 mm, 6.0 mm)
- One quick connect extension
- Four reamers (4.0 mm, 4.5 mm, 5.0 mm, 6.0 mm)
- One impactor
- One screw block containing:
    - Forty 3.5 mm cortical and locking screws ranging from 10 mm - 24 mm length
    - Four ulnar resection guide balls (size 10/20 x 2, size 30 x 2)
- One quick connect handle with a 1.5 mm square driver for cover screws / lock pin

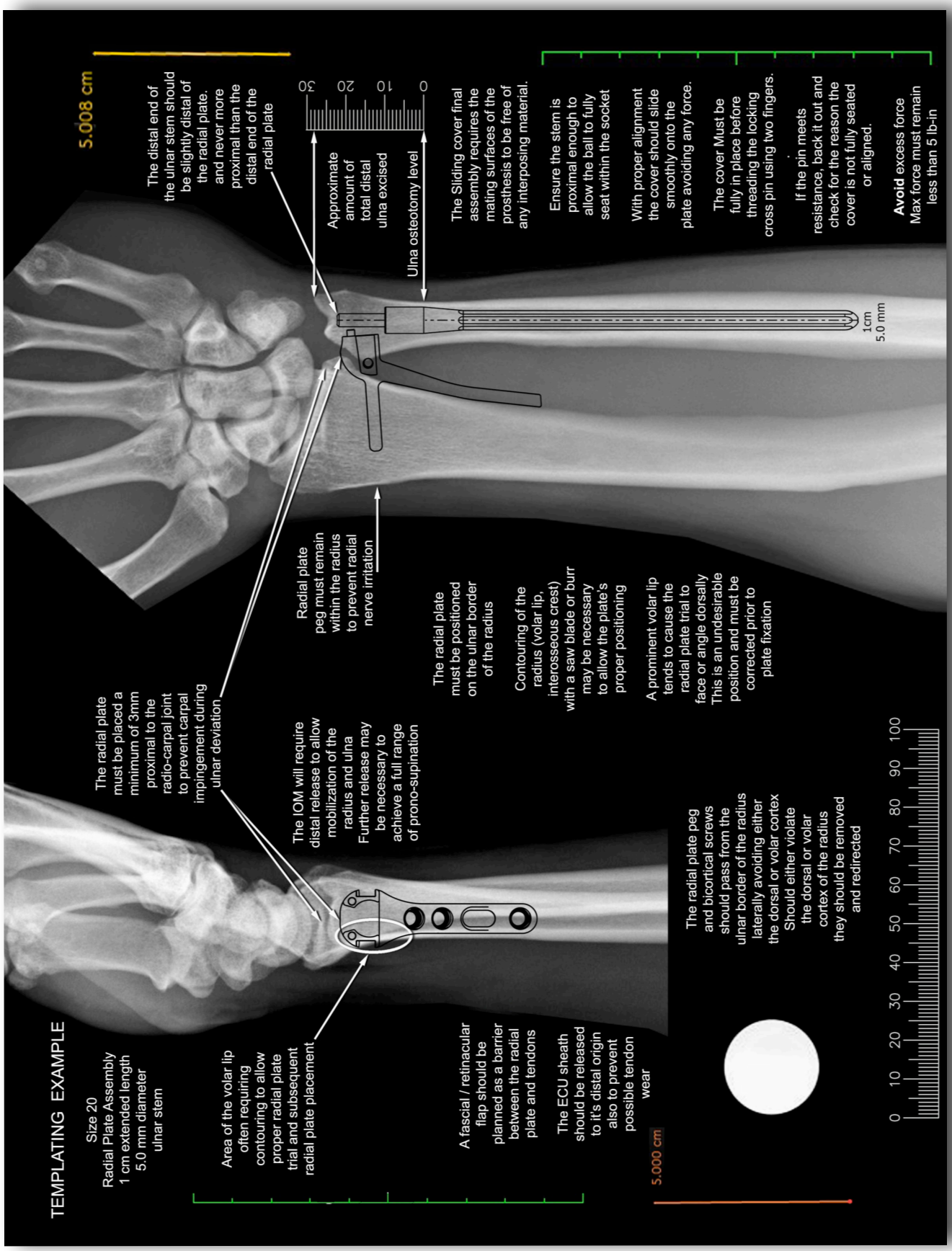
# TEMPLATING

Templating of pre-operative **scaled** x-rays should be accomplished prior to surgery to determine if the patient is a candidate and if so the correct size and position of prosthesis. Many different forms of scale including rulers and objects such as coins can be used as long as they are of a known size / measure. The templates display options from three sizes of radial components and sixteen sizes of ulnar stems. When reviewing the templates, the radial plate should be placed no less than 3 mm proximal to ulnar border of the lunate fossa. This is to prevent possible carpal impingement with the distal plate and / or the distal end of the ulnar stem. Proximal placement of the plate can vary between the minimum of 3 mm from the lunate fossa up to 2 cm depending on the width of the radius. The contour of the plate generally allows good bone to plate contact but deformities of the radius must be considered. The templates also aid with pre-operative planning such as any radial contouring if necessary. On the lateral plane, templates are used to check size and placement of the prosthesis. The chosen size should not protrude into the dorsal plane of the extensors. The plate should be placed precisely on the ulnar border of the radius and confirmed with a true lateral x-ray. The appropriate ulnar stems are selected by assessing the ulna concerning items such as the width of the medullary cavity, condition of the distal ulna and any curvature. A templating service is offered by Aptis Medical to assist with patient selection, prosthesis selection and prosthesis placement. The service also provides notes intended to assist with each individual case at no cost.

During the procedure, x-ray or image intensifier views similar to the templated images will confirm accurate placement of the radial plate. It must be ensured a true lateral image is in view and should show the plate perfectly squared (not tilted dorsal or volar). If the plate is tilted dorsally it could potentially cause unnecessary wear on the extensors tendons namely the ECU. Dorsal tilt can also allow the plates peg and / or screws to penetrate the volar surface of the radius which must be avoided. In the true lateral x-ray view with the radial plate trial properly positioned, you should be able to see through the unobstructed holes in the trial plate.

**Note:** *When imaging during the procedure to assess implant position relative to the anatomy, centralize the area of concern within the image to avoid parabolic distortion.*

# Example of Templated X-rays with various options for scale



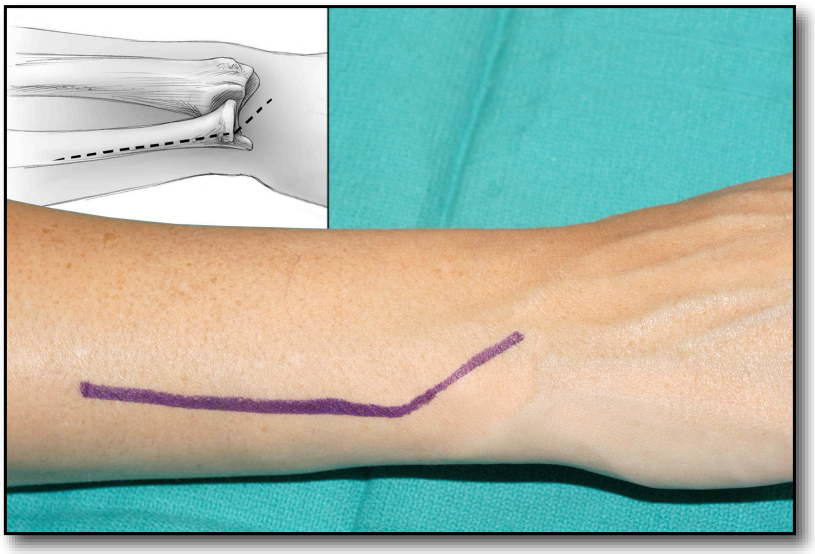
# SURGICAL PROCEDURE

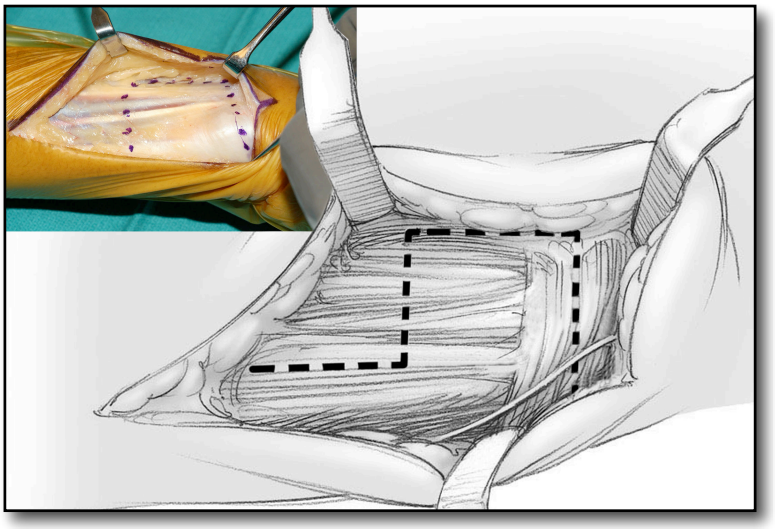
## Patient Preparation

The procedure is generally accomplished under axillary block and involves standard methods of prepping and draping for the upper extremity. The operative site preparation should be treated the same as any total joint replacement. An adhesive plastic surgical barrier drape is applied to reduce contact between the skin and the implant similarly to other total joints such as hips or knees. A tourniquet is always used with a pressure setting of approximately 250 mm Hg (approximately 100 mm Hg above the patient's systolic pressure).

## Incision / Dissection

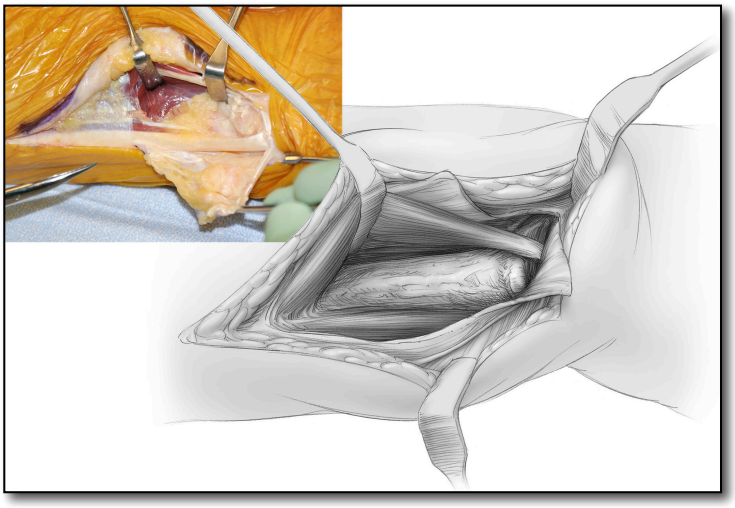
With the forearm in full pronation, a 8-9 cm longitudinal incision is marked splitting the difference between dorsal and lateral along the ulnar border of the distal forearm turning radially at the head of the ulna for an additional 2 cm. The incision should be just radial to the extensor carpi ulnaris (ECU) for added protection of the dorsal sensory branch of the ulnar nerve. If the patient has had prior surgery in the area, the old incision may be incorporated in the exposure.



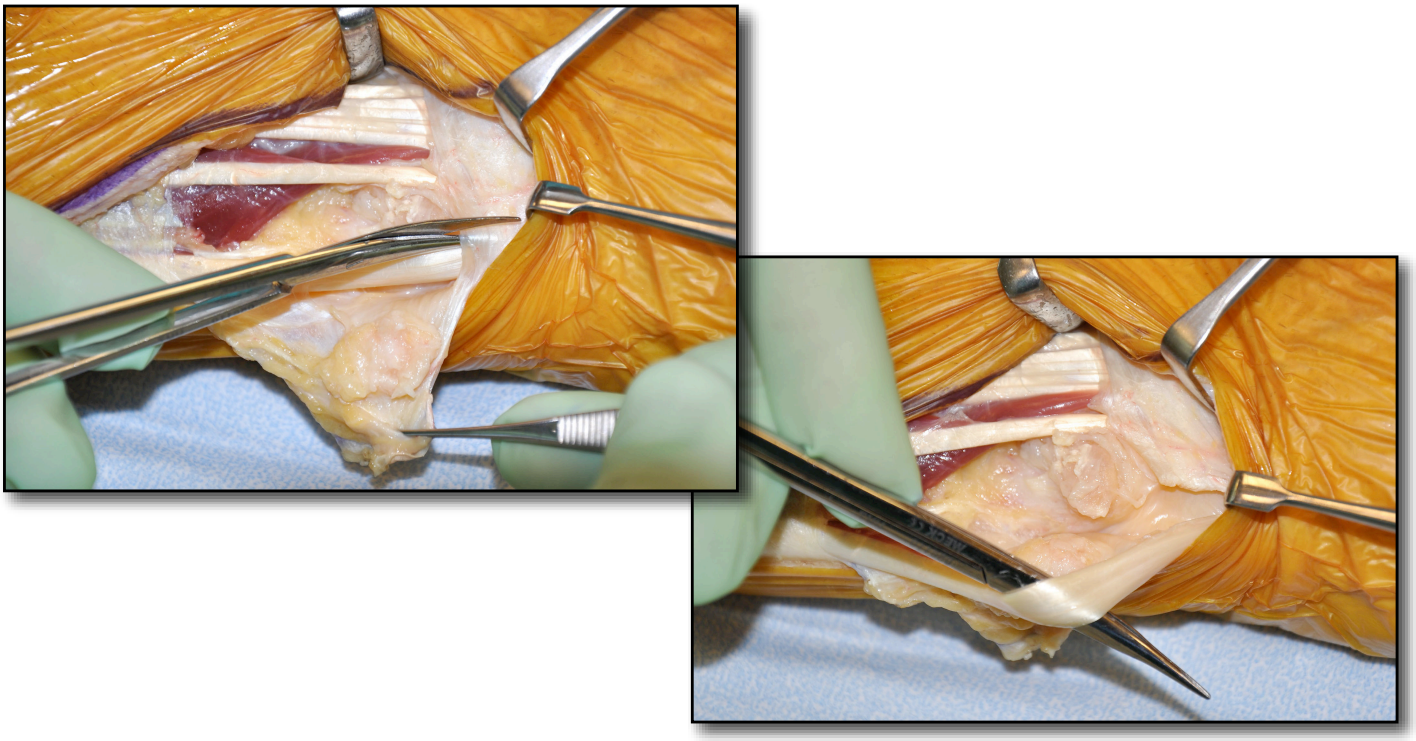


The skin and subcutaneous fat are elevated from the forearm fascia up to the second dorsal compartment. A fascial / retinacular flap based ulnarward and extending radially to the second compartment should be elevated to later provide a barrier between the prosthesis and the ECU tendon. As the flap is elevated ulnarward the dorsal radio-ulnar joint capsule may be included for additional padding.

As the dissection passes the fourth compartment the extensor digiti quinti (EDQ) is moved radially to allow incision into the joint capsule of the DRUJ. The incision is then carefully deepened reflecting the joint capsule as part of the flap to add bulk. Continuing to reflect the flap, the ECU is released from the flap's radial and inferior side to free the tendon.



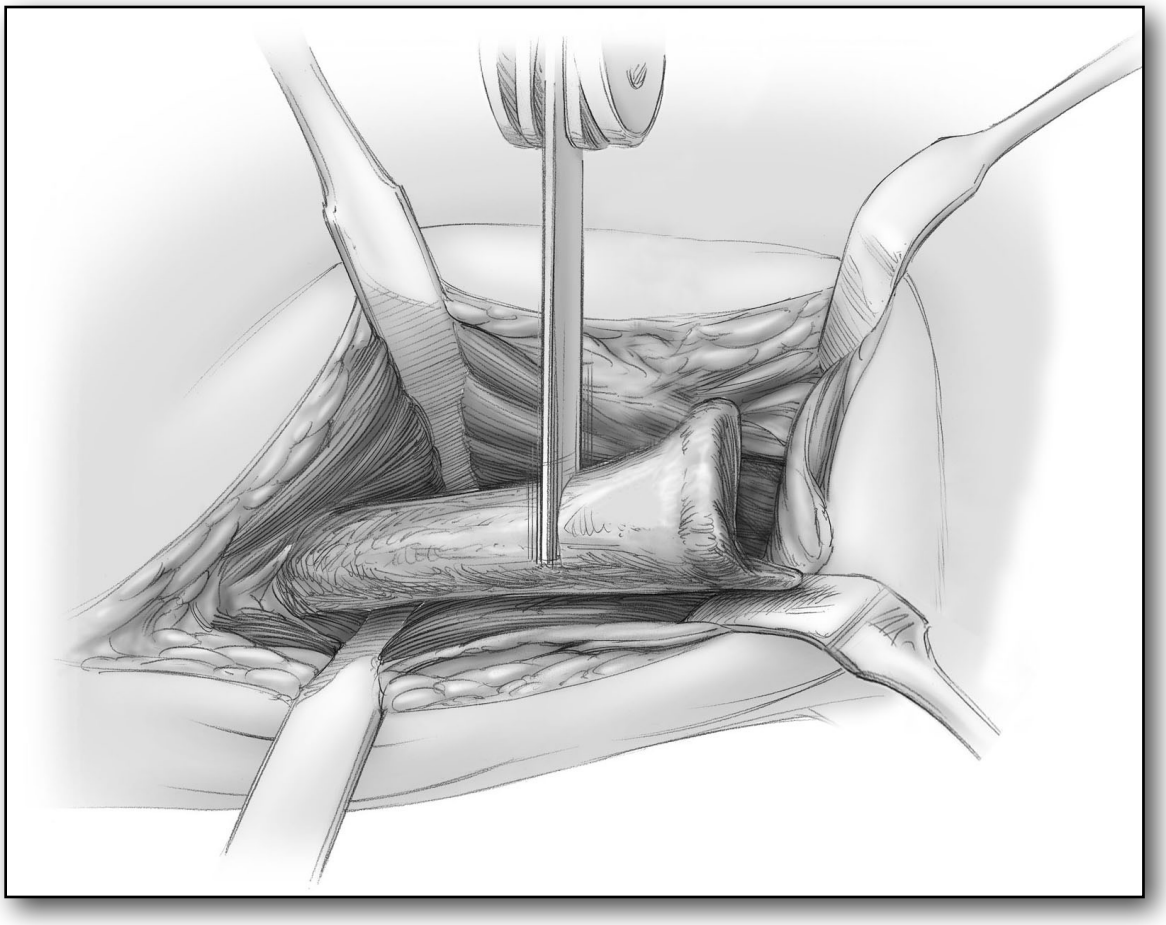
The dissection of the ECU is continued distally taking care to protect the dorsal sensory branch of the ulnar nerve. The ECU sheath is released to its distal insertion to prevent contact or rubbing between the tendon and the head of the implant.



The surgical field is expanded by extending the incision between the ECU and EDQ proximally where we find the extensor indicis proprius (EIP) origination on the dorsum of the ulna. The EIP muscle is carefully dissected and elevated taking us to the dorsum of the interosseous membrane. At this point we can elevate the extensor tendons from over the radius to expose the interosseous crest.

# Ulna Head Excision

Good exposure and retraction are paramount for proper visualization and from this point forward an experienced assistant is recommended. Retractors are used to protect soft tissues while avoiding excess force. With the forearm in full pronation, the head of the ulna, if present, is excised with an oscillating saw just proximal to the flare or neck of the ulna. Usually the osteotomy is approximately 2 cm from the distal end of the ulna taking into account any ulnar variance. The radial attachment of the triangular fibro cartilage if found intact is left undisturbed. This structure can provide a buffering barrier between the prosthesis and the carpal bones. Excising the ulna head allows volar displacement of the shaft of the ulna enabling visualization of the sigmoid notch and the interosseous crest of the radius.

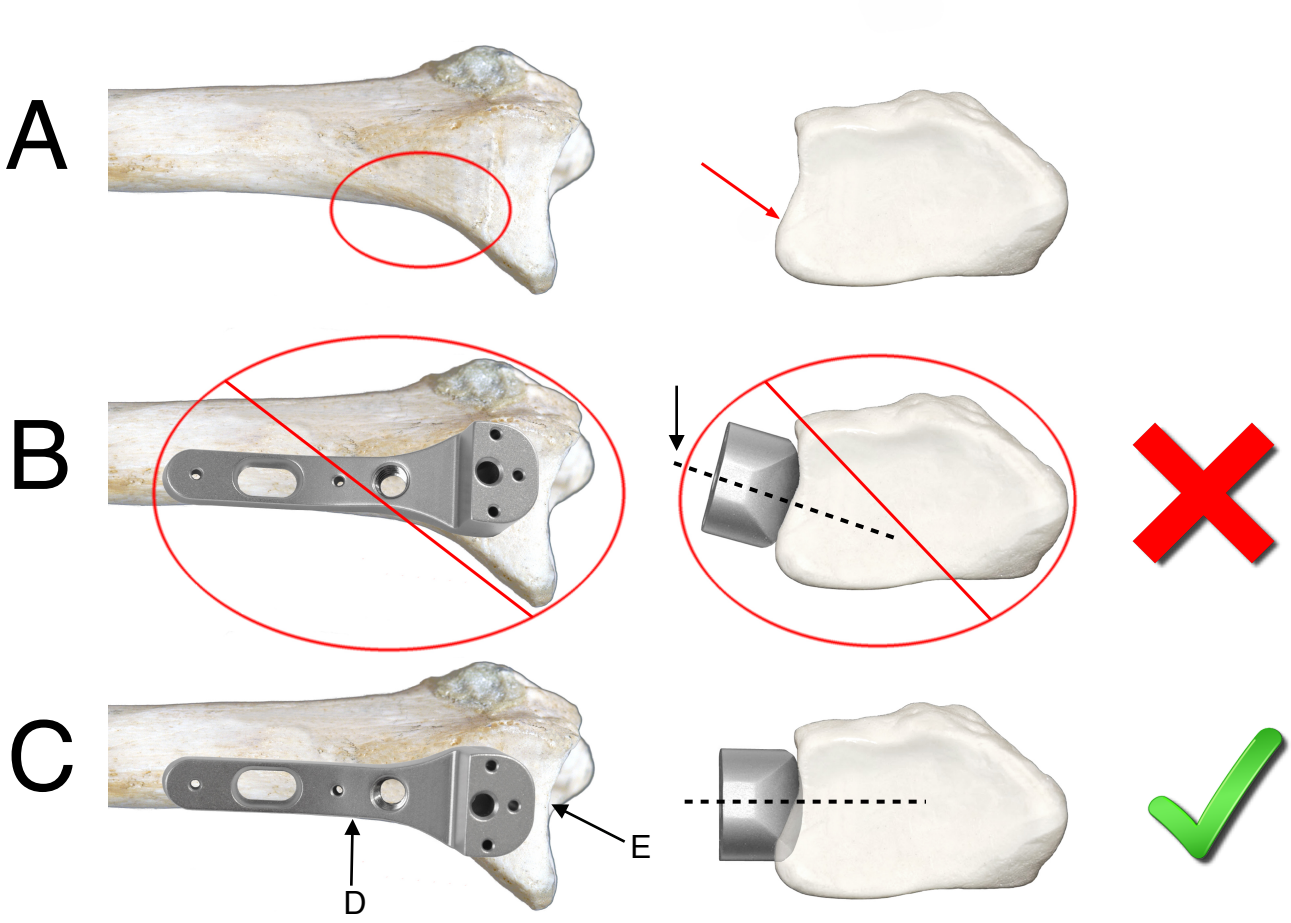


Osteophytes, if present in the area of the Distal Radio-Ulnar Joint are excised.

The dissection then follows dorsally over the ulna onto the dorsal surface of the interosseous membrane (IOM). The IOM is elevated from the radius along the distal 8-9 cm of the interosseous crest. Once released, forearm rotation should be checked for full pronation and supination. If forearm rotation is lacking due to scarring of the IOM continue to release the IOM as proximal as needed until achieving full motion. Once completed the construct of the prosthesis will provide the needed stability.

# Radial Plate Trial Positioning

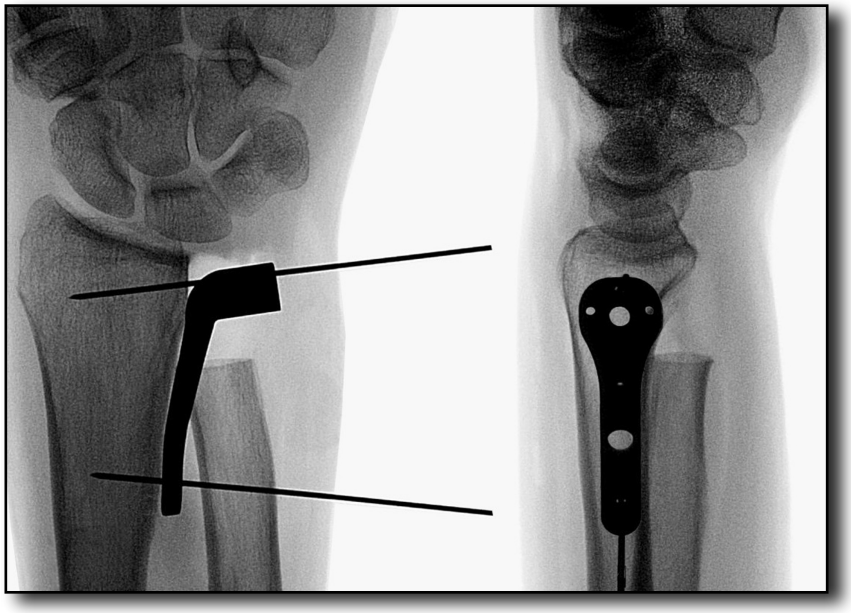
The volar lip of the radius (A) at the sigmoid notch tends to rotate the trial dorsally (B). The volar lip should be reduced by means of a burr or saw blade to allow the trial to face purely ulnarward (C). This is especially critical when using a locking plate as the screw direction is in a fixed angle. Once radial contouring is complete, the radial plate trial is then placed over the interosseous surface of the radius in the area of the sigmoid notch aligning it with the volar edge of the radius. To help ensure the trial is facing the proper direction the radial peg drill bit can be placed in the large centered distal hole. With the peg bit placed in the guide hole, the direction of the bit extending from the plate can be noted and corrected if needed. When the hand is placed flat on the OR table, the bit should be parallel to the table. The pre-contoured design of the plate generally ensures good plate-to-bone contact. If any gross incongruence presents, the radius should be contoured to provide better contact. Care should be taken to avoid excising too much cortical bone which would weaken the radius. The volar facing edge of the trial should be on the same plane as the volar surface of the radius (D). A minimum of 3 mm must separate the distal end of the trial and the lunate fossa (E) in order to prevent possible carpal impingement. If required, the trial may be positioned more proximally depending on the thickness of the radius but never more than 20 mm proximal to the radio carpal joint.



Using .045” (1.1 mm) k-wires for temporary fixation, the trial’s position must be checked with x-ray or an image intensifier. Proper PA and lateral positioning must be confirmed before proceeding.

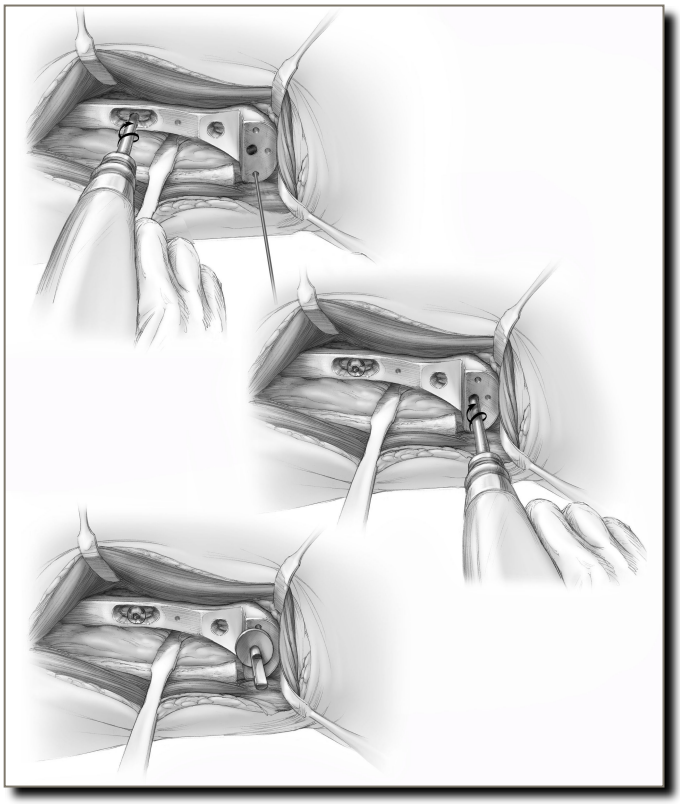
With the forearm and hand positioned flat (palm down) on the operating table, the two k-wires should be parallel to the surface of the table. Also, the radial peg drill bit can be inserted into the distal guide hole of the trial to help visualize the direction the plate is facing. The peg bit should be parallel with the table when with the arm in this position.

Ensuring a true proper lateral x-ray and with the trial correctly positioned you should see through the unobstructed holes of the trial.

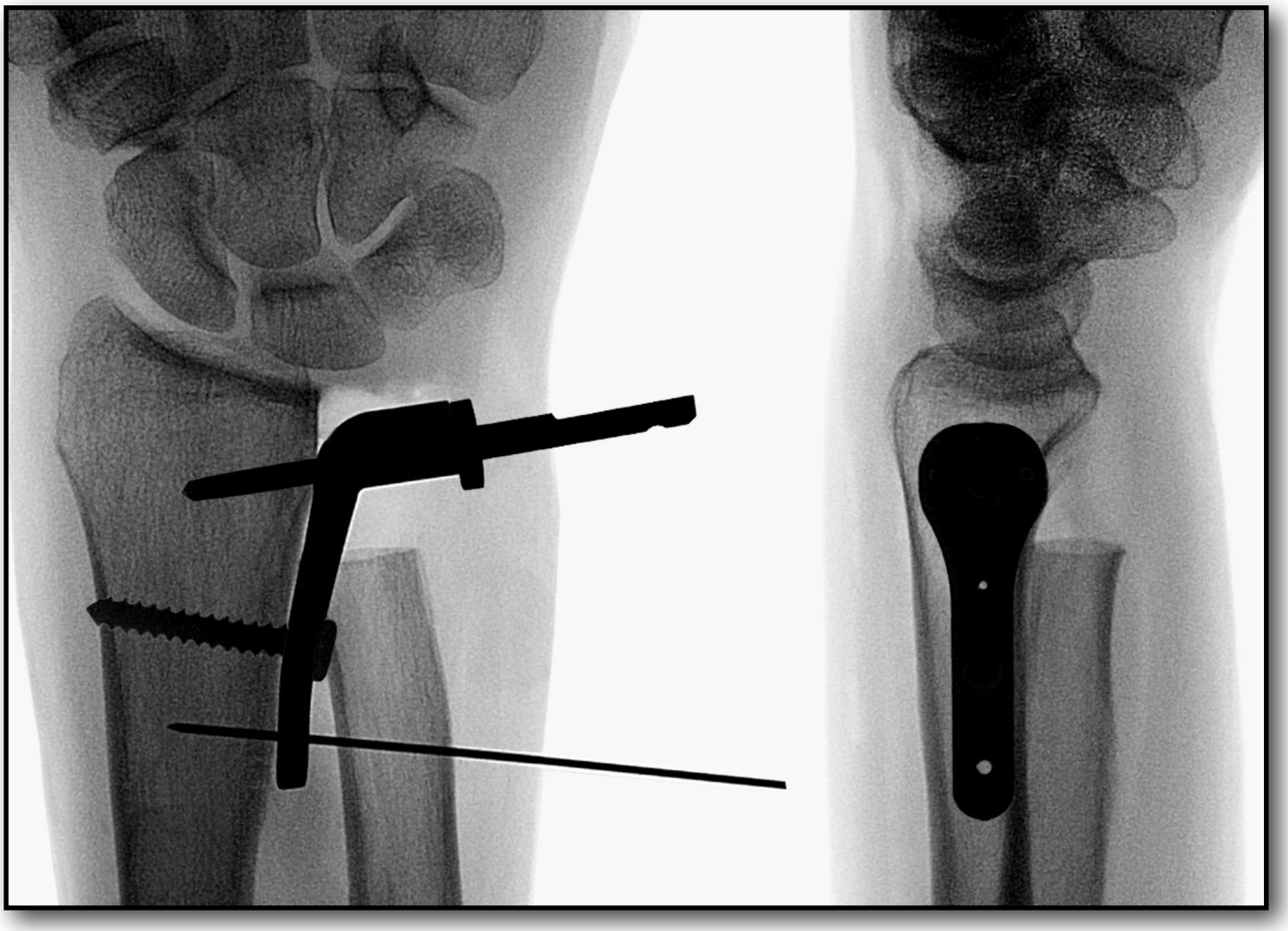


**If adjustments to the position of the trial are necessary, they must be made at this point as the position of the trial directly corresponds to the position of the radial plate of the prosthesis when implanted.**

With the trial k-wired in appropriate position, the locking drill guide is threaded into the size 10 trial and a 2.5 mm hole is drilled transversely through the radius. For the size 20 or 30 trials, the hand held drill guide is used. All drilled holes should be placed centrally through the shaft of the radius avoiding volar or dorsal misdirection. Violating dorsal or volar cortical bone when drilling across the radius must be avoided as it will weaken it and possibly cause a fracture. The oval hole allows positioning adjustments for the size 20 and 30 prior to final trial fixation. Screw length is determined using the depth reference guide. A 3.5 mm tap is used to prepare the hole prior to inserting and tightening a 3.5 mm compression screw. Non-self tapping screws protect the tapped thread allowing screw interchange if the correct length is not initially selected. Excessive screw length must be avoided to prevent radial nerve or soft tissue irritation. With the screw tightened in place the distal k-wire is removed and proper PA and lateral positioning is confirmed prior to continuing. The radial peg drill bit is then inserted through the distal guide hole of the trial and the hole for the radial peg of the prosthesis is drilled. Care should be taken to avoid passing the bit through the dorsal, volar, or far cortex. Passing the drill bit or radial plate peg bit through the far cortex can cause extensor tendon and / or radial nerve damage.



The radial peg drill bit and screw should be left in place while using x-ray or an image intensifier to confirm PA and lateral positioning. Oblique views of 30° from lateral will assist confirming travel of the radial peg drill bit and the fixation screw. Should either be noted as violating the dorsal or volar cortex, they should be removed and redirected. Also if multiple drilling attempts are made the radius should be considered weakened and protectively splinted post-operatively. The images of the fixed radial plate trial will mirror that of the radial plate of the prosthesis once it has been placed in position. **Note: The PA x-ray view is best for determining carpal distance. A true lateral x-ray view is required to determine proper plate alignment without angulation.**

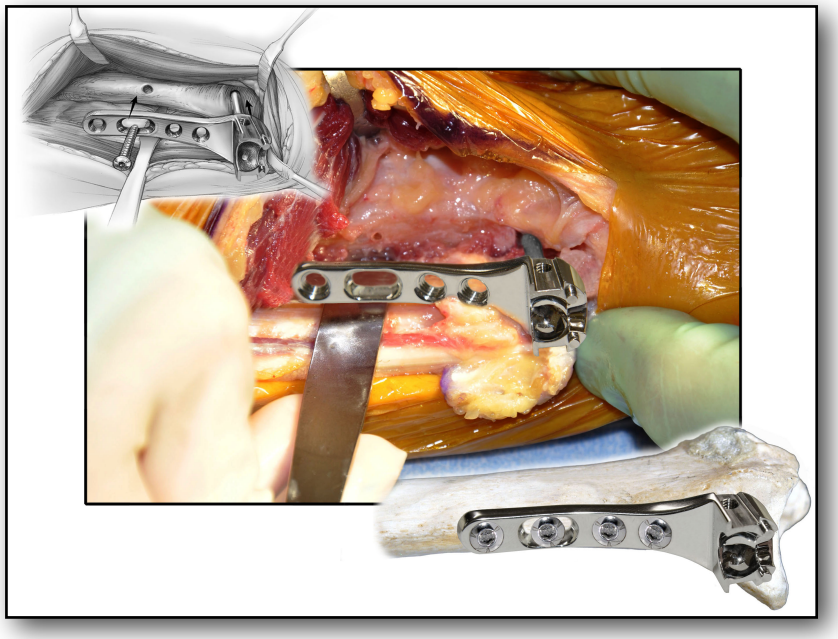


After accepting proper positioning of the radial plate trial, it is removed and the corresponding distal radioulnar joint plate assembly is opened. The assembly contains one radial plate, one UHMWP ball, one radial plate cover and a single locking cross pin.

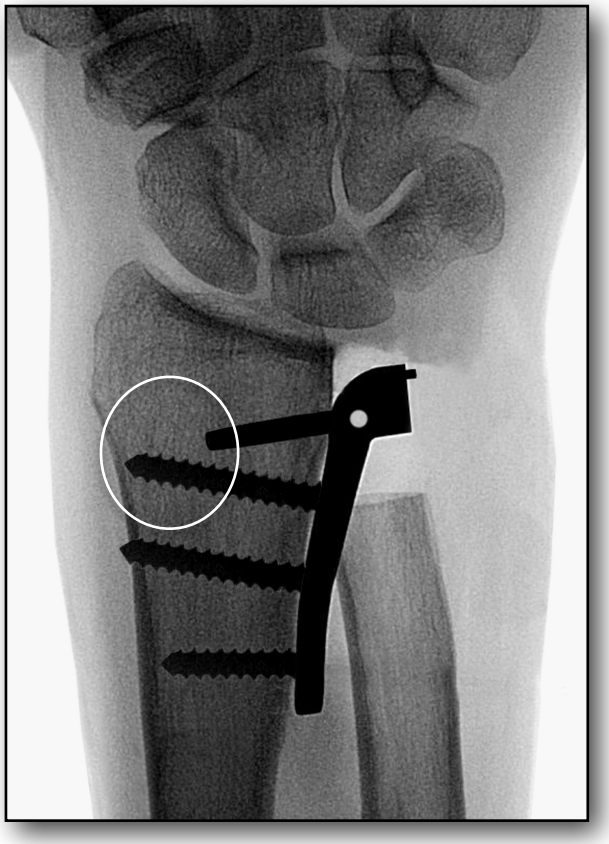
# Radial Plate Introduction and Fixation (Compression Plate, size 20 or 30)

*(Replacing the Function of the Sigmoid Notch)*

After thorough irrigation the radial plate is introduced. Soft tissue should be retracted to prevent any from being trapped between the plate and radius. The transverse peg is introduced into the pre-drilled hole. Care should be taken to ensure the peg follows the same path as the former drill bit. If insertion of the peg is difficult, a plastic impactor can be used to protect the plate while gently tapping it into place. The compression screw is then added and tightened through the oval hole. Travel of the radial plate's peg should be confirmed prior to completing fixation. Using the appropriate drill guide the remaining holes are drilled, measured, tapped and the appropriate screws inserted. Depending on the selected radial plate, fixation is completed with 2, 3 or 4 suitably sized 3.5 mm cortical or locking bone screws.



**Excessive screw length should be avoided to prevent possible extensor tendon and / or radial nerve damage.** When using a compression plate, in most cases a 3.5 mm screw 18 mm in length is recommended for the most distal fixation hole to prevent potential impingement against the transverse peg. The distal screw for the fixed angle locking plate can reach the far cortex but should not pass through (note image). Oblique views of 30° from lateral will confirm travel of the radial plate peg and the screws. Should any be noted as violating the volar or dorsal cortex, they should be removed and redirected. The most proximal screw should remain uni-cortical to help prevent a possible stress riser in smaller bone.



# Radial Plate Introduction and Fixation (Locking Plate, size 10 or 20)

The surgical technique for the locking plate is similar to the non-locking / compression plate with the following provisos during the plate placement. As with the compression plate ensure that the trial plate is properly aligned on the ulnar border of the radius. The trial cannot be angulated volar or dorsal as this would misdirect the locking screws which are fixed angle. Use an x-ray or image intensifier to confirm on the lateral view of the distal forearm the trial plate's position. The position must allow all drilling and subsequent screws to travel from the ulnar border of the radius to the radial side of the radius with no volar or dorsal misdirection. As in the standard DRUJ procedure, while k-wired in place, the trial's position is confirmed. The oval hole of the size 20 trial or the single middle circular hole in the size 10 trial is drilled, measured, tapped and a temporary bicortical compression screw inserted. While maintaining two points of fixation, the hole for the radial peg is drilled using the radial peg drill bit.

**For the size 20 plate**, the second proviso is an extra step during the permanent plate implantation. After confirming good positioning, the trial is removed and the permanent plate is implanted tightening the compression screw in the prepared hole (fig 1). The next step is to place the locking drill guide in the next distal hole (fig 2), confirm its direction and complete drilling with a 2.5 mm drill bit. The depth of the hole is measured and the hole is tapped using a 3.5 mm tap. A temporary bicortical compression screw is introduced through the locking hole of the plate. The screw is used to draw the radial plate against the radius without damaging the threaded hole. This extra step ensures that the plate is tight against the radius when drilling, tapping and applying the remaining locking screws.

Fig 1

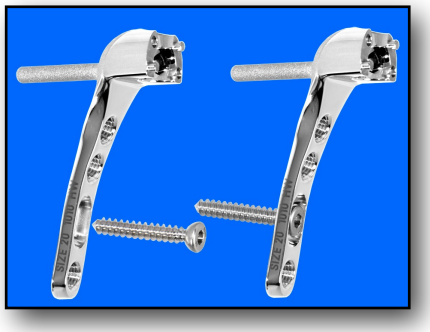
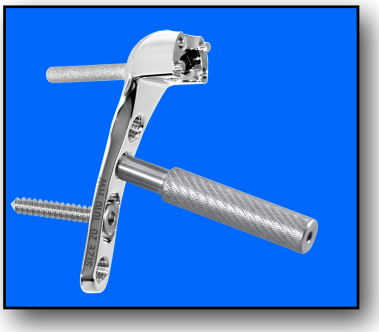


Fig 2



While the two compression screws are holding the plate tight against the radius (fig 3), the remaining threaded locking screw holes are drilled using the locking drill guide. The holes are then measured and tapped. When selecting the correct length locking screw, choose **one size (2 mm less)** than what is indicated on the depth reference guide. This adjusts the screw length as the threaded head engages the threaded plate. The appropriate locking screw is then inserted and tightened into the plate. To complete fixation of the radial plate the most proximal hole is prepared in the same manner with the exception of remaining uni-cortical. The oval hole retains a correct length compression screw while the more distal temporary compression screw is removed and replaced with the appropriate length locking screw (fig 4).

Fig 3

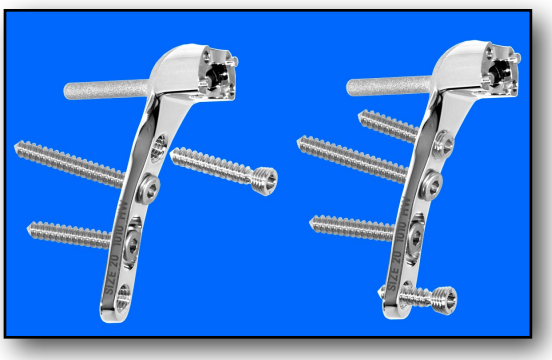
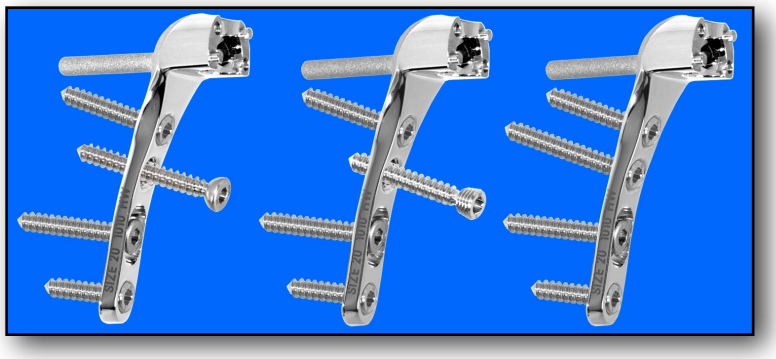
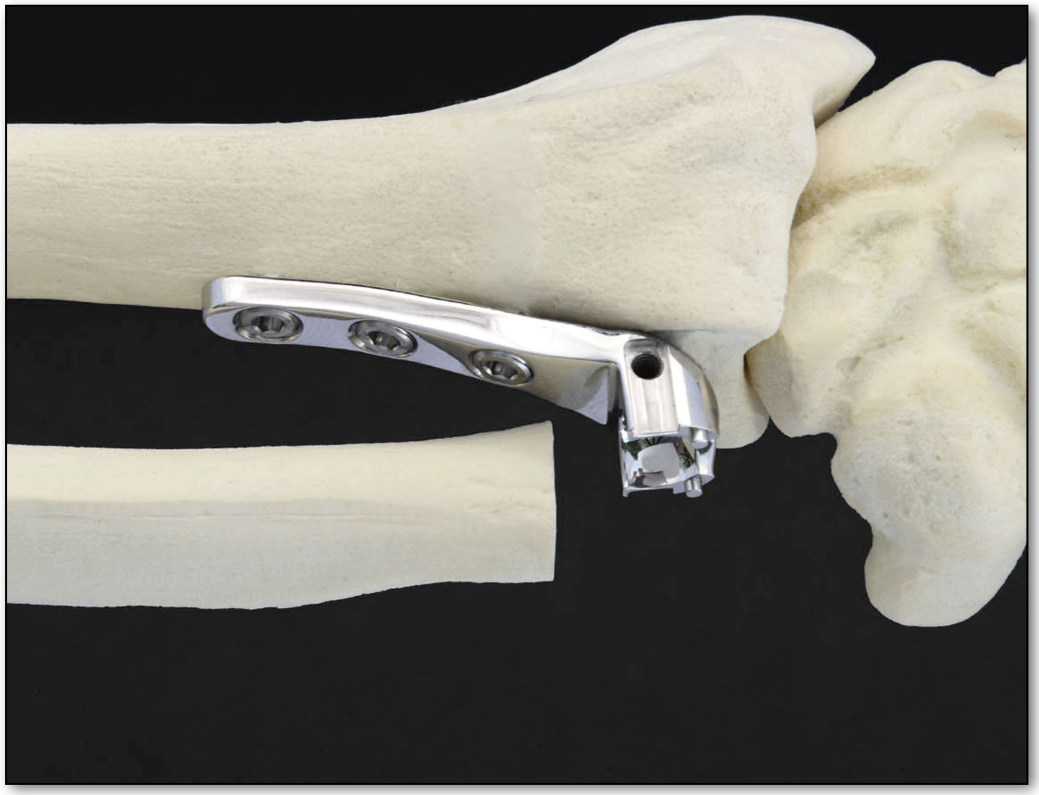


Fig 4



# Radial Plate Introduction and Fixation Size 10

**The size 10** locking radial plate has only three locking screw holes. Begin with a temporary compression screw in the center hole. Next the distal hole is prepared by drilling to but not passing through the far cortex. The hole is then measured and tapped before selecting a locking screw **2 mm shorter** than the measurement indicated. Secure the appropriate locking screw in the distal hole. Next, the most proximal hole is prepared in the same manner also remaining uni-cortical. Finally, as long as the temporary middle compression screw was the correct length it is removed and replaced with a locking screw one size shorter**.** This accounts for the threaded screw head engaging into the radial plate.

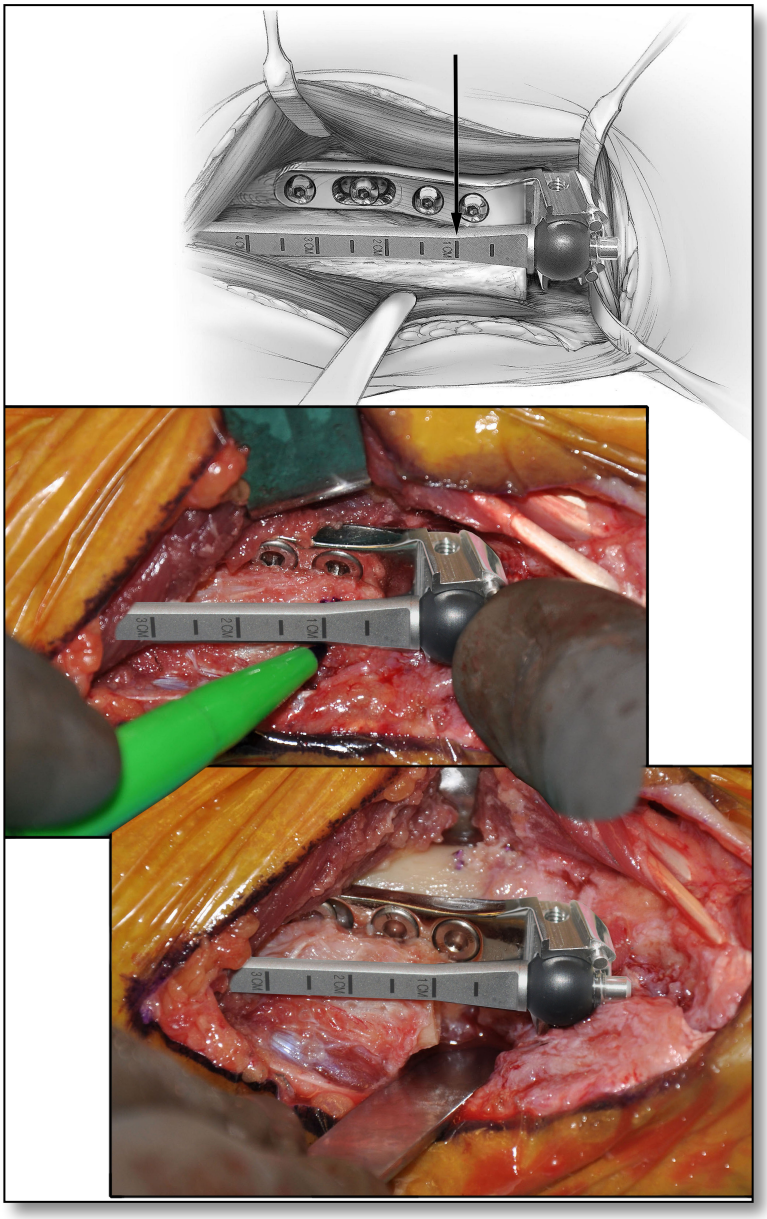


**All screws** should pass no farther than the far cortex of the radius; as long screws can become a point of irritation for soft tissues and cause possible nerve damage. The proximal screw should remain uni-cortical to prevent a stress riser.

**After completing locking plate fixation, the remaining steps of the technique are the same as the compression / non-locking plate.**

# Distal Ulnar Resection

The ulnar resection reference guide is first mated with a threaded, correspondingly sized interchangeable ball, black for the size 10 and size 20 or blue for the size 30 prosthesis. The selected ball **must be** fully threaded onto the guide prior to use. To determine the final resection level of the ulna, the forearm is first **fully pronated** before the guide is positioned alongside the ulna and the ball is inserted into the hemi-socket of the fixed radial component. The ulna is juxtaposed along the guide to allow a visual assessment of the amount of ulna shaft to be resected. The guide is marked in 1/2 cm increments with each full centimeter mark corresponding with the available ulnar stem lengths. The ulna should be marked and resected through good bone stock at the most distal possible option and proper resection level confirmed.



The 1 cm extended ulnar stem is intended as the first option to seal the marrow cavity and avoid ectopic bone formation. Additional extended ulnar stem lengths 2, 3, 4 cm are available when additional distal ulna length has been lost due to injury or previous surgery.

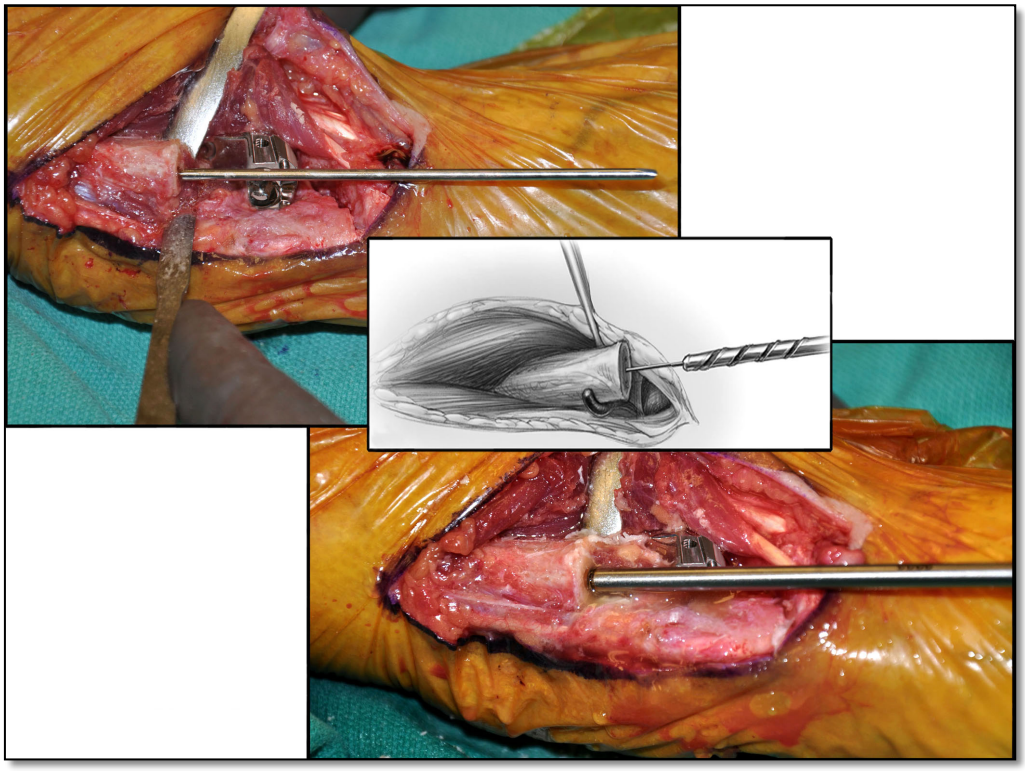
**Note:** *Marking the resection level with the forearm in full pronation will allow a small amount of tolerance between the ball and the base of the implanted ulnar stem upon proper completion of the prosthesis.*

For cases with additional ulna loss, the measuring reference guide is marked in increments of 1 cm. Should ulna length fall between the marks, the ulna should be resected to the next closest proximal mark. This length should be determined pre-operatively using a template. The black measure ball used for the size 10 and 20 is pictured below. A blue measure ball must be used for the large size 30.

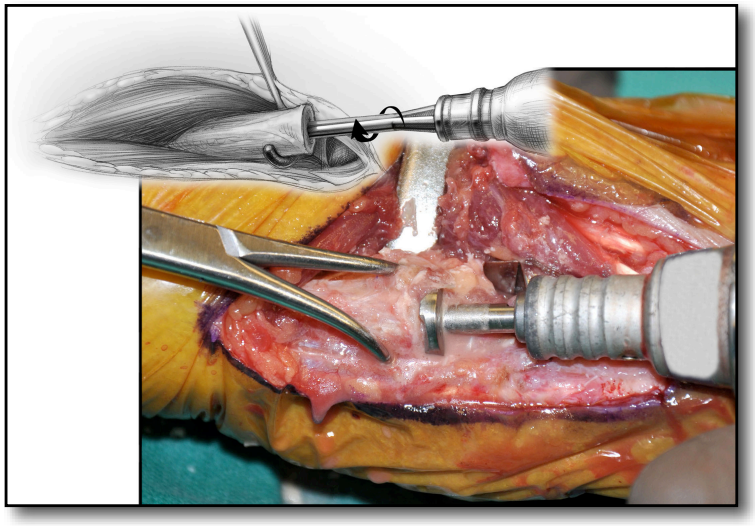

**Note:** *For ulnar defects longer than 4 cm a custom length ulnar stem may be an option.*

# Preparation for the Ulnar Stem

Following appropriate distal ulna resection, a 2 mm or 2.4 mm guide wire is inserted into its medullary canal beyond the intended reach (11 cm) of the following cannulated drill bit to act as a centralizing guide. If there is any question as to the travel of the guide wire, it should be confirmed with x-ray or an image intensifier. Next, a cannulated drill bit either a 4.0, 4.5, 5.0, or 6.0 mm in diameter and marked to a set depth of 11 cm is inserted over the guide wire and the medullary canal drilled from the distal end of the ulna. Staged drilling beginning with the smallest diameter and moving up until achieving the feel of a good press fit is encouraged. Copious amounts of irrigation should be used to keep the bone and drill bit cool. If significant resistance is met while drilling, the bit should be regularly removed every 5 to 10 seconds, cleaned and cooled before continuing to the required depth (11 cm). When the drill bit is removed **it must be ensured that the guide wire is properly repositioned proximal enough before continuing to drill.** Upon completion of drilling, the bit and guide wire are removed.

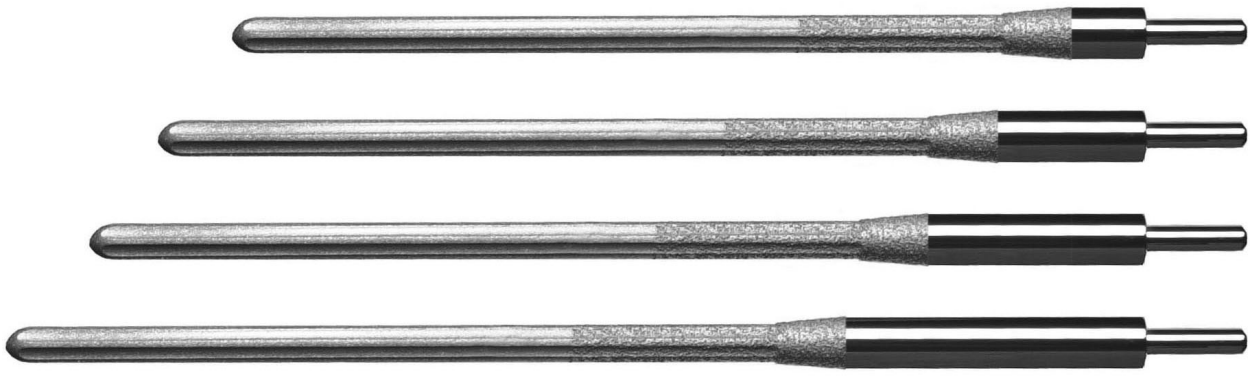


Final ulna preparation requires a medullary finish reamer or broach of an appropriate corresponding size, i.e., 4.0, 4.5, 5.0, or 6.0 mm in diameter. The size of the reamer is selected corresponding to the size of the last cannulated drill bit used. The reamer is inserted into the medullary canal and drilled down until its shoulder comes into contact with the end of the ulna shaft. This is the final step prior to insertion of the ulna stem. If the wrist has limited motion or is fused an extension for the reamer is supplied to provide extra clearance if necessary.



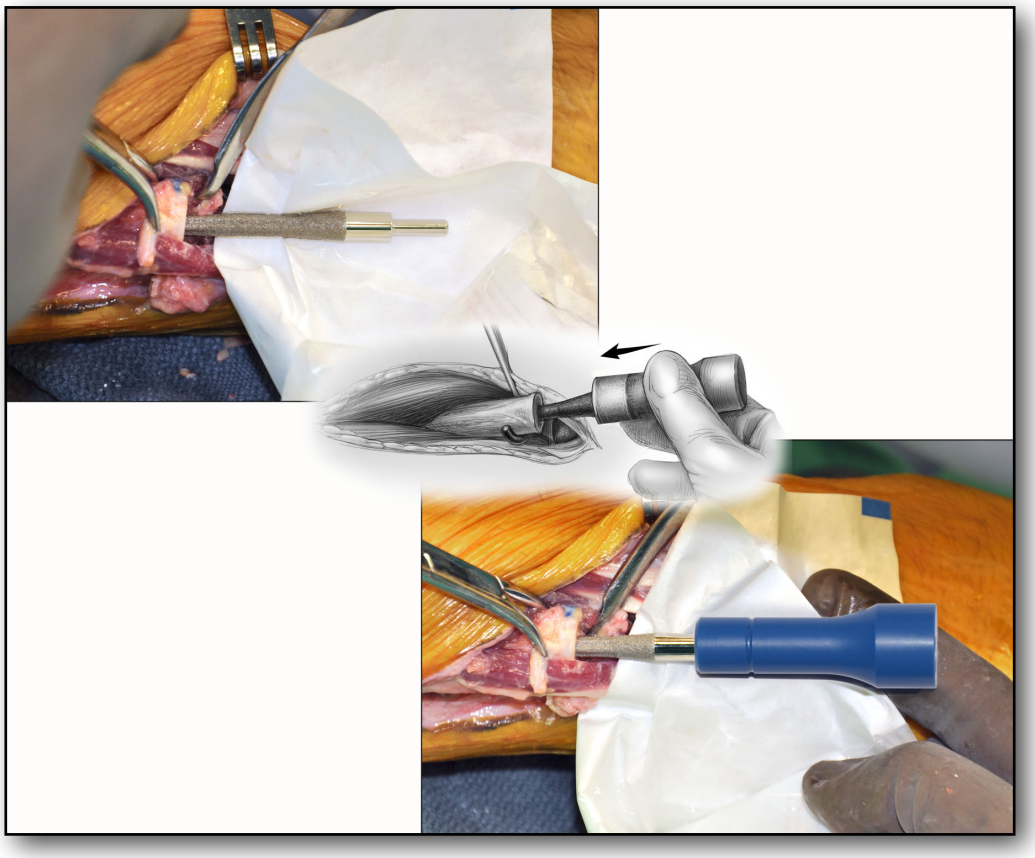
# Ulnar Stem Optional Lengths and Diameters

| Ulnar Stems | 1 cm Extended | 2 cm Extended | 3 cm Extended | 4 cm Extended |
|---|---|---|---|---|
| 4.0 mm Diameter | IS140 | IS240 | IS340 | IS440 |
| 4.5 mm Diameter | IS145 | IS245 | IS345 | IS445 |
| 5.0 mm Diameter | IS150 | IS250 | IS350 | IS450 |
| 6.0 mm Diameter | IS160 | IS260 | IS360 | IS460 |

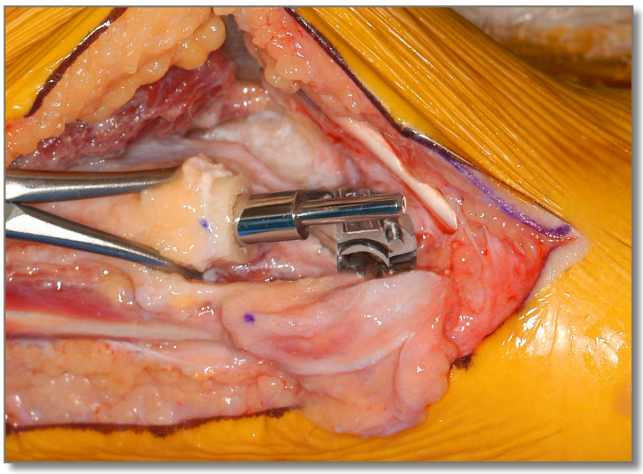


# Introduction of the Ulnar Stem

The medullary canal is thoroughly irrigated and the stem of the ulnar component is introduced. We recommend limiting contact with the portion of the stem to be embedded during insertion. When inserting the stem resistance is met as the plasma coating engages the interior of the ulna. A plastic impactor is used to protect the distal peg portion of the stem when using a mallet to complete implantation.



**Care should be taken not to over insert the selected stem. In all cases the distal end of the stem should be distal to the distal end of the radial plate. The stem should never be more proximal than equal to the distal end of the radial plate. With the small size 10 the distal stem should remain at least 2 mm distal of the radial plate.**

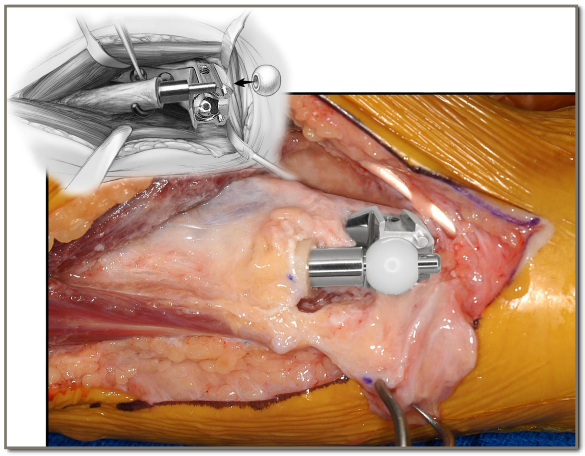


All stems should be impacted until the distal end of the stem is distal to the distal end of the radial plate. At no time should the distal end of the stem be proximal to the distal end of the radial plate. **Extra care should be taken not to over insert the stem.** The plasma coating may or may not be fully embedded within the ulna. If the ulna osteotomy level is not ideal, the stem may be left proud of the ulna and purposely not fully embedded. In order to provide proper support of the ball the distal stem and distal radial plate should be no less than equal.

## UHMWP Ball Placement

*(Replacing the Function of the Ulna Head)*

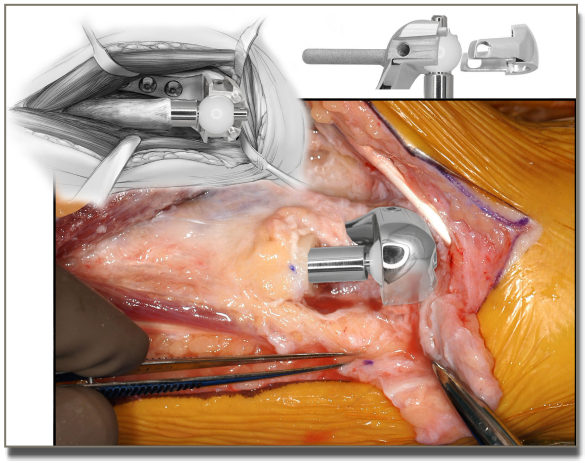
The ultra-high-molecular-weight polyethylene (UHMWP) ball is placed over the distal peg of the ulnar stem. While ensuring the absence of interposing material, the ball and stem are positioned within the hemi-socket of the radial component effectively replacing the two articular surfaces of the DRUJ. There should be space between the proximal ball and widened stem to allow the ball to be fully seated in the socket. If the ball is not fully seated, the cover will not fully close.



## Radial Plate Cover Placement (Sliding Cover)

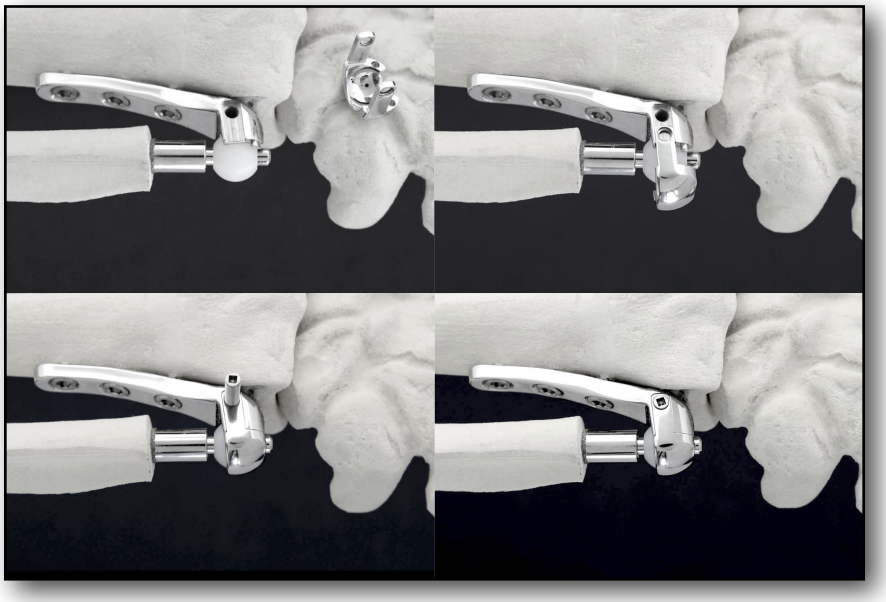
*(Replacing the Stabilizing Characteristics of the TFC)*

**The sliding cover (small opening distal) must be fully slid into place prior to inserting and advancing the single locking cross pin. <u>Do Not</u> force the cover or the lock pin as they could be damaged. Incomplete cover closure can be caused by interposing material, an ulnar stem not positioned proximal enough or too great of an angular difference between the radius and ulna (pre-operatively checked by templating). Once the cover is fully seated, it must be ensured the lock pin is threading properly and the screwdriver must be in alignment with the pin as it is advanced. The pin should advance easily. If resistance is met, back the pin out and check for the cause. Again ensure the cover is fully seated before continuing or damage such as bending of the cover or lock pin breakage can occur. Once the lock pin has been fully advanced, two finger tightening technique should be used to firmly secure it.**



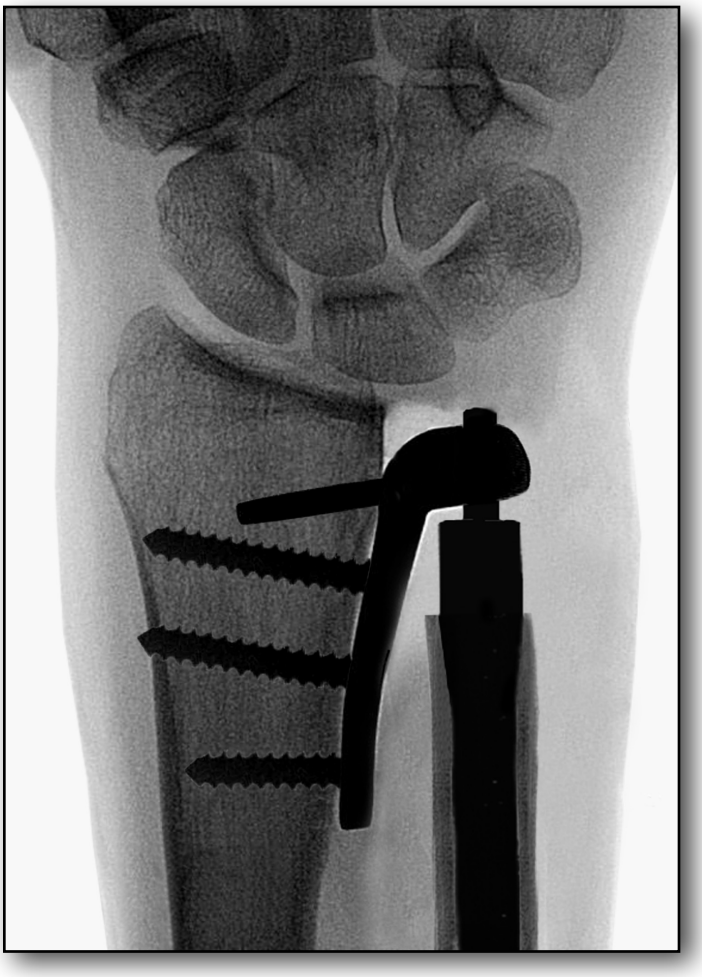
**Caution:** *During final assembly ensure the mating surfaces of the prosthesis are free from interposing material and the cover is fully in place prior to securing the cover. The locking cross pin should be easily advanced and firmly secured using a two finger tightening technique.*
*(3.0 to 3.5 lb-in. of force).*

***AVOID** excess force to prevent locking cross pin or screw breakage. **Max** force must remain less than 5 lb-in.*



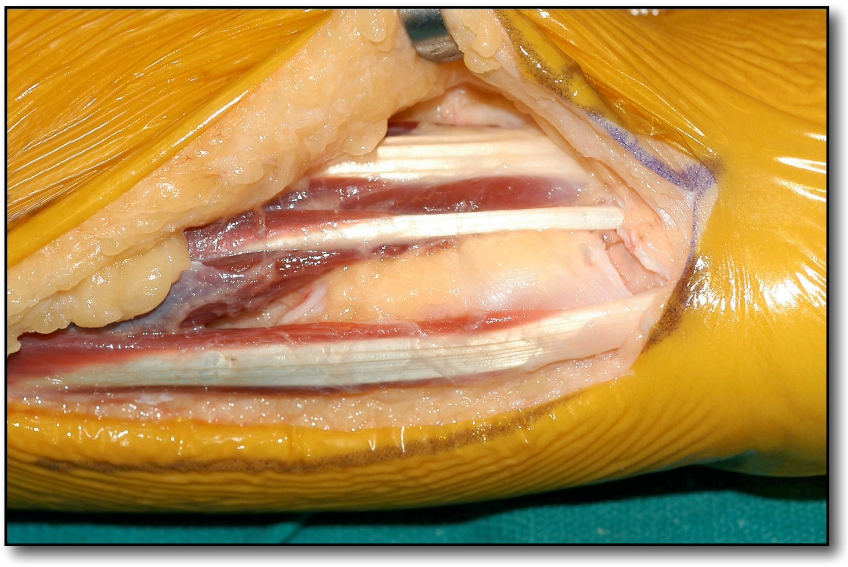
## Range of Motion Evaluation

The image intensifier is again used to confirm adequacy of the overall position. The forearm is moved through a full range of prono-supination ensuring free movement. A properly positioned prosthesis should allow a full range of motion. If full range of motion is not realized, notably supination, scarring of the interosseous membrane (IOM) can be the cause and it should be released until the desired motion is obtained.



## Closure

After thorough irrigation to remove any bone fragments, bone marrow or debris the tourniquet is released and complete hemostasis secured. The fascial/retinacular barrier flap is now positioned inferior to the ECU and superior to the distal prosthesis. Closure is achieved by apposing the previously created flaps with 3/0 braided non-absorbing sutures.



Final wound closure follows in a layered fashion. The skin is closed by surgeon's preference. If bleeding is noted, care should be exercised to prevent hematoma. It is recommended that a prophylactic antibiotic be used for a minimum of 5 days.

## Post-operative management

As long as all steps of the procedure proceeded as described and no additional procedures were performed, a well-padded short arm splint is applied. This splint remains in position for 2 weeks at which time sutures are removed and range of motion exercises are started. Therapy is initiated with active range of motion and weight bearing exercises. Further therapy may or may not be required according to the needs of the patient. A therapy protocol can be provided when requested. If other procedures were incorporated, post-op protocol should be adjusted accordingly.

CE 2797

EC REP

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