rHead
Extended Stems

Operative Technique

- Standard Extended
- Bipolar Extended
This publication sets forth detailed recommended procedures for using Stryker devices and instruments. It offers guidance that you should heed, but, as with any such technical guide, each surgeon must consider the particular needs of each patient and make appropriate adjustments when and as required.

A workshop training is recommended prior to performing your first surgery.

All non-sterile devices must be cleaned and sterilized before use. Multicomponent instruments must be disassembled for cleaning. Please refer to the corresponding assembly/disassembly instructions.

Please remember that the compatibility of different product systems have not been tested unless specified otherwise in the product labeling (rHead Extended Stem Instrument Set – Instrument and Sizers V15106).

See package insert (Instruction for Use V15116, V15112, V15158) for a complete list of potential adverse effects, contraindications, warnings and precautions. The surgeon must discuss all relevant risks including the finite lifetime of the device with the patient when necessary.
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Indications & Contraindications

Indications

**With a hemi-elbow implant:**
rHead, rHead Recon, and rHead Lateral Implants are indicated for use in replacement of the radial head for degenerative, or post-traumatic disabilities presenting pain, crepitation and decreased motion at the radiohumeral and or proximal radioulnar joint with:

- Joint destruction or subluxation visible on x-ray
- Resistance to conservative treatment
- Primary replacement after fracture of the radial head
- Symptomatic sequelae after radial head resection
- Revision following failed radial head arthroplasty

**With a UNI-Elbow implant:**
The Stryker Radio-Capitellar implant is indicated for use in the elbow for reduction or relief of pain and/or improved elbow function in skeletally mature patients with the following conditions:

- Non-inflammatory degenerative joint disease including osteo-arthritis or traumatic arthritis
- Inflammatory degenerative joint disease including rheumatoid arthritis
- Correction of functional deformity
- Revision procedures where other treatments and devices have failed
- Treatment of fractures that are unmanageable using other technologies

Contraindications

- Inadequate skin or musculotendinous system
- Growing patients with open epiphyses
- Previous open fracture or infection in or around the joint
- Known sensitivity to materials used in this device

Warnings and Precautions

Please see package insert for Warnings, Precautions, Adverse Effects, and other essential product information.
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The Initial Incision

The patient is placed under a general or a regional anesthesia. The extremity is prepped and draped in the usual sterile fashion. A sterile tourniquet is often a good option. An arm table may be used if the patient is in a supine position or the arm may be brought across the chest.

A classic Kocher skin incision is made identifying the interval between the anconeus and the extensor carpi ulnaris (Fig. 1). The incision extends approximately 6-7cm. The dissection is carried down to the joint capsule. The origin of the anconeus can be released subperiosteally and retracted posteriorly to permit adequate exposure of the capsule.
Capsular Exposure

If the elbow is stable, the capsule is exposed by elevating a portion of the extensor carpi ulnaris sufficiently to allow identification of the lateral collateral ligament complex (Fig. 2A). Alternatively, the extensor carpi ulnaris may be split longitudinally in line with its fibers staying anterior to the attachment of the lateral collateral ligament. The lateral capsule is divided slightly anteriorly to the collateral ligament and the annular ligament and capsule are reflected anteriorly and posteriorly to expose the radial head.

A portion of the lateral collateral ligament and anterior capsule can be reflected off the lateral epicondyle and anterior humerus to expose the capitellum if necessary. The lateral ulnohumeral ligament must not be disturbed. If the ligament has been disrupted, then the exposure progresses through the site of disruption to expose the resected proximal radius.

The common extensor tendon and elbow joint capsule are retracted as needed to maximize exposure (Fig. 2B).
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Using the Radial Head Resection Guide for extended stems

The radial neck cut requires a resection guide and the additional spacer flange (Fig. 3A). The device is inserted over the capitellum with the axis of the alignment rod oriented over the ulnar styloid (Fig. 3B). This alignment reflects the anatomic axis of forearm rotation. Test forearm rotation with the guide in place to ensure proper alignment. The proximal flange of the guide is placed against the articular surface of the capitellum and the rotating flange/alignment rod assembly is then guided proximally or distally to the desired length of radial shaft resection (Fig. 3C).

Each notch on the threaded portion of the rod corresponds to a different head size. The rotating flange placement direction must be matched to the anticipated radial head implant size and the axis of forearm rotation. Once the desired length has been established, the proximal flange is secured by tightening the locking nut. The guide must be again aligned to the ulnar styloid (the axis of forearm rotation), not the radial shaft.
Resecting the Radial Head

Using the resection guide, the blade should be guided by the distal surface of the flange (Fig. 4A). During the resection, the forearm is pronated and supinated while the cutting guide is used to align the sawblade to the axis of rotation (Fig. 4B). Once initial alignment cuts have been made, the guide is removed and the resection is completed. The distal extent of resection is the minimal amount that is consistent with the restoration of function (Fig. 4C). This includes at least the margin articulating with the ulna at the radial notch.

If the medullary canal is not obvious after the radius has been recut, a high speed bone burr is employed to identify the proximal radial canal.

In addition, radial length should be restored (axial traction) using a lamina spreader if there is a positive ulnar variance.
**Intramedullary Preparation**

If the elbow is unstable, varus stress and rotation of the forearm into supination allows improved access to the medullary canal. If the elbow is stable but the exposure is not adequate to access the medullary canal; but careful reflection of the origin of the collateral ligament from the lateral epicondyle, and placing the elbow in more flexion is necessary to permit adequate access to the medullary canal. The canal is entered with a starter awl using a twisting motion (Fig. 5A), or a high speed bone burr, so the broaching process can be initiated. The awl is directed towards the thumb. The canal is then broached as allowed by the pathologic anatomy of the proximal radius (Fig. 5B). Serial sized broaches are used until the broach fits snugly in the canal at the appropriate depth.
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Trial Stem and Head Insertion

The appropriate sized trial stem is inserted straight into canal (Fig. 6A). The angle of the collar is directed away from the radial styloid. A notch on the collar of the trial stem and implant is provided to assist in positioning (Fig. 6B). The notch on the collar of the trial shall be oriented towards the radial styloid. Assure the collar is flush with the resection.

Choosing the Correct Head Size

Use the resected native head to properly determine the head size to be trialed. To avoid overstuffing, if the native head is between two sizes, it is generally preferable to select the smaller rather than the larger size.

The trial head is attached to the trial stem (Fig. 6C), and tracking, both in flexion and extension and forearm rotation, should be carefully assessed. Malalignment of the osteotomy will cause abnormal tracking during flexion/extension and forearm pronation/supination.

Note:
In some instances adequate tracking cannot be attained. In this circumstance the implant should not be used.
Implanting the Final Components

Once acceptable alignment has been determined, the trials are removed and the permanent prosthesis is inserted in two steps. First the radial stem is placed in the medullary canal and tapped into place with the impactor (Fig. 7A). The notch on the collar of the stem shall be oriented towards the radial styloid. If a firm fixation is not present at the time of the insertion of the trial stem (i.e. stem can be easily extracted from or rotated in the medullary canal), then bone cement (PMMA) is recommended. Second, the modular head is placed over the taper while applying longitudinal distraction and/or varus stress to distract the radiocapitellar interface sufficiently to permit the radial head to be inserted. Once inserted over the taper, the radial head is secured using the impactor (Fig. 7B). The elbow is then reduced (Fig. 7C) and tested again in flexion/extension and pronation/supination. If exposure permits, the head and stem can be assembled on the “back table”.

Note:
Care should be taken to protect the taper from any damage, including but not limited to scratches and contact with bone cement.
Closure

A simple closure is permitted if the collateral ligament is sufficient. If the collateral ligament has been disrupted, a Krakow stitch is used. A No. 5 absorbable suture is placed distally, crossing the site of the lateral ulnar collateral ligament and is then brought proximally.

Both ends of the suture are brought through a drill hole at the anatomic origin of the lateral collateral ligament complex and exit posteriorly.

The forearm is placed in full or partial pronation and the suture tied (Fig. 8). The elbow is splinted at 90 degrees flexion and in neutral to full pronation. If ligamentous tissue is insufficient, a formal lateral collateral ligament reconstruction is done.

Step 9

Aftercare

Passive flexion and extension may be allowed on the second day assuming the elbow is considered stable. The goal of radial head replacement and soft tissue repair is to achieve elbow stability. Both flexion/extension and pronation/supination arcs are allowed without restriction. Active motion may begin by day five.

As with any prosthetic replacement, long term aftercare requires surveillance. If the implant is asymptomatic and tracks well, routine removal may not be necessary.
Notes
A surgeon must always rely on his or her own professional clinical judgment when deciding whether to use a particular product when treating a particular patient. Stryker does not dispense medical advice and recommends that surgeons be trained in the use of any particular product before using it in surgery.

The information presented is intended to demonstrate the breadth of Stryker product offerings. A surgeon must always refer to the package insert, product label and/or instructions for use before using any Stryker product. Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your Stryker representative if you have questions about the availability of Stryker products in your area.

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