Radial Head Replacement: Fixed Anatomic

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Disclosure

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Radial Head Replacement: Indications

• Comminuted radial head fractures not amendable to fixation (3 or more fragments)
• Fracture/dislocations or Essex-Lopresti lesion
Radial Head Anatomy
• Elliptical shape
• 15° lateral angulation
• Articular surface has variable offset
• Poor correlation between head size & medullary canal
  • Modular implants desirable

Advances in implant design & techniques
• Improved anatomic reconstruction
• Improved patient outcomes

Solid vs. Smooth Stems
1. Solid (press-fit/ingrowth coating)
  • Anatomic vs. Non-anatomic
  • Partially coated
  • Fully coated
2. Smooth Stem
Non-anatomic vs. Anatomic Designs

- Non-anatomic designs greater chance of:
  - Overstuffing
  - Maltracking
  - Subluxation
- Anatomic (modular) Designs
  - Improved tracking
  - Less risk of overstuffing

Non-anatomic Designs

- Require surgeons to:
  - Undersize the stem (better to understuff than overstuff)
  - Undersize the head (avoid overstuffing the PRUJ)
    - Remember, the native head is elliptical!
  - Smooth stems
    - Loose fit stem to allow for improved tracking

Anatomic Designs:

- Allow surgeons to:
  - Trial intraop for best head position prior to engaging spiralock screw
  - Dial in the best fit with an articulating head that can be locked
Non-anatomic Reconstructions: Complications

- Edge loading may occur from overstuffing or maltracking
- May lead to:
  - subluxation, capitellar wear, & loss of motion

Solid, Fully-coated Stems

- Fully coated stems are known to cause stress shielding

My Ideal Implant

- Solid
- Partially-coated
- Longer stem to accept the physiologic loads applied to the elbow
- Adjustable head that can be locked in to minimize edge loading
Case Example #1

- 41 year old male who fell off truck tailgate. Works for window treatment company.
- Physical exam:
  - Extension 40° to flexion of 80°
  - Pronation 80° & supination to Neutral
  - NVI
  - Negative DRUJ pain or laxity

Injury Films

Case Example #1: Anatomic Solid Fit- RHA
Case Example #1: 3 Months Post-Op
• Pain free
• Ext-flex: 5-140°, 90/90 pronosupination. NVI. Full strength.

Case Example #2: RHA s/p radial head fracture dislocation

2mos s/p RHA.
Ext-flex: 15-130 deg. Full pronosupination
6 yrs later: pain and decreased ROM
old stem may have not been able to support physiologic load
may have contributed to failure of head-neck locking mechanism

Revision RHA to anatomic solid fit design
- Anatomic design allows independent fit of radial neck and radiocapitellar tracking for best fit

3mos s/p revision RHA
- Doing well
- Ext-flex: 5-160 deg. Full pronosupination. NV. Good strength
Technical Pearls of Wisdom

- Restore “Fit”
  - Downsize stem if RC maltracking
  - Upsize head if edge loading (restore articular disc)
- Restore length to within 2.5 mm
  - Avoid over- and understuffing
- IntraOp x-ray before leaving room

Conclusion

The radial head is **NOT** disposable

- More severe injuries necessitate preservation or replacement of the radial head as well as addressing associated ligament & bony injuries
- Fix it when possible
- Replace it when not salvageable
- I prefer a solid partially-coated anatomic design

Questions?

...CASE CLOSED!