Radial head replacement: When and how?

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I. Radial Head
- Important 2 degree stabilizer
- Valgus instability
- Proximal migration
- Posterior translation

II. Assessment of Radial Head Fractures
- Type of fracture
  - Mason I – undisplaced
  - Mason II – displaced partial articular
  - Mason III – displaced complete articular
  - Mason IV – with elbow dislocation

- Associated injuries
  - elbow ligaments
  - interosseous membrane and DRUJ
  - other fractures

III. Mason Type I
- Commonest type
- Splint for comfort for 5-7 days
- Early motion (Holdsworth Injury, 1987)
- Longer immobilization means worse results

Notes:
• ORIF not indicated

IV. **Mason Type II**
• Partial articular, displaced fractures
• Operative Indications
• Displaced >2-3 mm
• Block to motion
• Can be treated nonoperatively

V. **Mason Type III / IV**
• Fixation is an attractive option

VI. **ORIF Radial Head – results**
• Odenheimer K, *JBJS(A)*, 1979
• Schumeli G, *JBJS(B)*, 1981
• King G, Evans D, Kellam J, *JOT*
• “Experience with open reduction and internal fixation is satisfactory in over 90 percent” Morrey, 1993

VII. **ORIF Radial Head – results**
• Carefully selected series performed by experts
• Operative indications obscure
• In 35% of patients (on average), ORIF was abandoned when unexpected comminution encountered intra-operatively.
• Results poor if more than 2 head fragments

VIII. **Fixation – Results**
• Ring, *JBJS(A)*, 2002
• 56 patients with type II or III radial head fractures
• Good results in 15/15 patients with non-comminuted type II fractures
• 11/12 good results in type III fractures with three fragments or less
• 13/14 comminuted type III fractures had a bad result
• 4/15 comminuted type II fractures had a bad result

**Notes:**
• Associated fracture dislocation compromised results

IX. **ORIF of the Radial Head**
• Poor results when comminuted or in association with elbow instability

X. **Radial Head Replacement**
• Moro et al., *JBJS(A)*, 25 pts.
• MEPS score mean 81
• Patient satisfaction 9.2/10
• No implant related comps
• Mean rotation 150 degrees

XII. **Radial Head Replacement**
• Moro et al., *JBJS(A)*
• MEPS score mean 81
• Harrington et al, *J Trauma*
• Long term results excellent
• Should be metal
• Should be modular
• Vastly improved prosthetic designs/implants available

XIII. **Conclusions – ORIF**
• ORIF is not indicated for the commonest type of fracture, Mason Type I
• ORIF results poor in comminuted type III fractures
• ORIF results poor with associated dislocations
• ORIF results marginal in comminuted type II fractures
• ORIF not reliable in revision cases or those with late presentation

XIV. **Conclusions – Prosthetic Replacement**
• Replacement is treatment of choice in revision cases and those with delayed presentation
• Replacement has good results in all type II, type III and type IV fractures
• Replacement has good results with associated dislocations
• Rapid improvement in available prostheses

**Notes:**
- Optimal design (anatomic / circular / bi-polar) and optimal fixation method (cemented / press-fit / “loose” fit) still unclear
- Most popular is loose-fit non-anatomic circular design
- Worse clinical results with press-fit rough stems that loosen (“sandpaper” effect)
- More research is needed