Comparison of Two Radial Head Implant Designs

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Retrospective

- **14 patients** smooth-stemmed bipolar (stainless steel stem, cobalt chrome head, poly liner)
  - 8 females, 6 males, mean age 50, mean f/u 36 mo (range 24-57 mo)

- **13 patients** in-growth monopolar (grit-blasted titanium stem, cobalt chrome head)
  - 5 females, 8 males, mean age 46, mean f/u 30 mo (range 18-48 mo)
Clinical Outcomes

- No difference between VAS, DASH, MEPI
- Elbow flexion smooth-stemmed bipolar > press-fit monopolar, difference < 10 degrees ($p < 0.05$)
- Forearm pronation press-fit monopolar > smooth-stemmed bipolar, difference < 10 degrees ($P < 0.05$)
Ectopic Bone

- Described and Classified
  (Hastings and Graham, Hand Clin 1994)

- Anterolateral margin of the radial neck and implant head
  - Trend for ectopic bone more frequently in the smooth-stemmed implant cases ($p = 0.07$)
Osteolysis

- Mean stem radiolucency measurement - greater with in-growth implants ($p = 0.03$)
  * more bone resorption with in-growth implant *

- Lucency stabilized 1 - 2 years in all cases
OSTEOLYSIS - Smooth-Stemmed Bipolar Implant

1 Pattern

“Thin radiolucent border around implant”

31 mo
OSTEOLYSIS - In-growth Monopolar Implant

2 Patterns

“Neck Resorption”

39 mo
OSTEOLYSIS - In-growth Monopolar Implant

“Periprosthetic Osteolysis”
Serology

• ESR, CRP, WBC, Absolute Eosinophil Count
  – Normal all 7 patients tests

• Metal Ions - Chromium, Cobalt, Titanium
  – Levels similar to published values for individuals with a well-functioning, unilateral hip replacement (Jacobs et al, JBJS Am 1998)
Conclusions

• At short- to mid-term follow-up...
  – Both smooth-stemmed bipolar and ingrowth monopolar implants can lead to acceptable clinical outcomes in the management of elbow injuries
  – Proximal radial ectopic bone formation and periprosthetic osteolysis are common findings, but of uncertain clinical relevance
• Periprosthetic osteolysis more pronounced with press-fit implants despite greater stem containment

• Failure of osseointegration may occur with micromotion (100-150 micrometers)

• Prospective comparative studies with long-term follow-up are necessary to further delineate the outcomes associated with different prosthetic designs.