Is Reverse TSA Overused in the Elderly?
Making Sense of the Literature

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Proximal humerus fragility fractures: recent trends in nonoperative and operative treatment in the Medicare population

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Look Closer

- Operative treatment not increasing.

- Among surgical patients:
  - 42% hemi (2005) → 24% hemi (2012)

- Similar 2 yr survival rates (methodology?).
  - 98% RTSA
  - 99% HSA
Why Reverse TSA?

- Greater tuberosity fixation / healing unpredictable.

- RTSA offers potentially cuff independent elevation of the arm.
Why not Everybody?

- Longevity
- Complication rates
- Activity limitations
- Cost / benefit
Which Fractures

• Displaced 3- and 4-part proximal humerus fractures

• Head splitting fractures

• Fx-dislocations

• REAL QUESTION IS :
  – HEMIARTHROPLASTY OR REVERSE SHOULDER?
Should we operate at all?

• Several RCTs looking at non-op mgmnt vs. Hemiarthroplasty (HA)
  – Boons et al CORR 2012
  – Olerud et al JSES 2011
  – Fialka et al JSES 2008

• NO DIFFERENCE!!
  – ASES / Constant
  – SST
  – ROM
    • Forward elevation
    • Abduction
But Wait!!

• Olerud et al JSES 2011

• SAME Constant / ROM

• But...
  – ↑HRQoL by EQ-5D
  – ↑DASH

• ARE WE USING THE RIGHT INSTRUMENTS?
What makes a good hemi?

- GT healing
  - Improved FE
  - Improved functional outcomes

- Failure of GT
  - Inability to elevate beyond 90 deg

- Role of fracture stems
  - Boileau et al JSES 2013
# Reverse TSA vs. Hemiartroplasty

**Two Recent Systematic Reviews**

- **Ferrell et al JOT 2015**
  - FE: 118 vs. 110
  - ER: 20 vs. 30
  - ASES / Constant same
  - Cx Rate: 9.3% vs. 4.1%
  - Revision: 1% vs. 4%

- **Mata-Fink et al JSES 2013**
  - FE: 113 vs. 92
  - ER: Equal
  - ASES: 75 vs. 56
  - Constant: 55 vs. 49
  - No difference in complications
Looking closer

Mata Fink et al (PRO REVERSE)

• Only comparative studies
  – RCTs
  – Case Controls
  – Subsequent series

Ferrell et al (equivalent)

• All series reporting results of hemi or RTSA
• Included many series of patients with EXCELLENT results after hemi
  – (Krishnan, Kontakis, Amirfeyz, Boileau)
Systematic review

- Only Reverse TSA vs. dedicated fracture stem
  - (210 vs. 230)

- Near equivalent results.
  - FE 114 vs. 117
  - ER 20 vs. 30
  - Constant 50 vs. 56
  - ASES 76 vs. 69

- Much higher complication rate in RTSA (largely dislocation)
Are there any Level I RCTS?

• Forcada et al JSES 2014
  – 62 patients (all > 70 yo)
    – RTSA much better
      • FE 120 vs. 80
      • Constant 56 vs. 40
      • Lower revision rates

• Cuff et al JBJS 2015
  – Consecutive series of patients
  – RTSA and Hemi are equivalent IF GT HEALS
    • Bimodal distribution with hemi “all or nothing”
Patient Factors

Sport / Activity after RTSA

- 66% swimming
- 10-50% golf
- 0%-25% tennis
- FE 140 / ER 50 in series
- Elective / Non-trauma setting

- Garcia et al AJSM 2015

Longevity

- Accepted survivorship
  - 83-89% at 10 years

- Deterioration of functional result after six years
  - (Walch et al / Sirveaux et al)
What about the option to convert?

Levy et al JBJS 2007

- 29 pts converted from hemi
- FE 38 to 73
- AB 34 to 70
- ASES 22 to 52
- 28% complication rate
- 55% GE / 21% poor

• CLEARLY INFERIOR TO PRIMARY REVERSE TSA
Complications

• Most papers cite higher rate of complications with reverse TSA vs. hemi (Mata-Fink, Ferrell, Namdari).

• If the rates of dislocation (reverse) and revision/conversion (hemi) are considered there is a much smaller difference in overall complication rate in shorter term studies.

• Longevity of either prosthesis is not fully understood.
Conclusions

• Data mixed regarding RTSA vs Hemi.

• Hemiarthroplasty clearly an excellent options in certain surgeons hands.

• Failure of the GT → far superior results with RTSA

• Dedicated fracture stem proven to have higher rates of GT union.
My Practice

• “Physiologically” young 65-70 yo patient
  – High demand (swim / tennis / golf / etc.)
  ➔ Hemiarthroplasty with fracture stem.

• “Physiologically” older patient, >70 yo:
  – Functionally low demand
  ➔ Reverse TSA – why risk GT failure?