30th Annual Orthopaedic Trauma Course
Friday May 18th, 2018

Case 4: Reverse Total Shoulder Replacement for Fracture - Why & When?

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Disclosures

Consultant: Acumed, Depuy-Synthes, Wright-Tornier, Zimmer-Biomet

Reviewer: JSES, JBJS, JAAOS, JOR, JSEA

Deputy Editor: JAAOS Shoulder/Elbow

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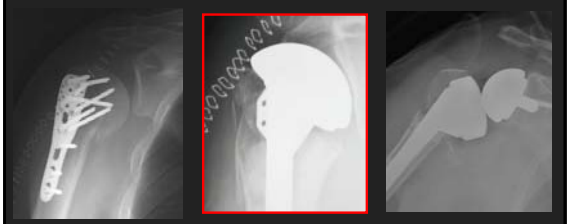
Proximal Humerus Fracture
Plate, Hemi or Reverse?



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One of my Favorite Topics

Review Article

Reverse Shoulder Arthroplasty for the Management of Proximal Humerus Fractures

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Abstract

The use of reverse shoulder arthroplasty is becoming increasingly popular for the treatment of complex three- and four-part proximal humerus fractures in the elderly compared with the often unpredictable and poor outcomes provided by open reduction and internal fixation and by hemiarthroplasty. Inferior results with plate osteosynthesis are often a result of complications of humeral head osteonecrosis, loss of fixation, and screw penetration through the

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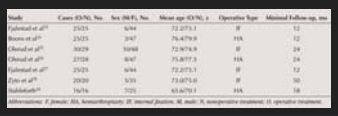
To Operate or Not To Operate? That is the real Question

- 7 RTCs 3 or 4 part PHFxs
  - Hemi vs Non-OP, ORIF vs Non-OP
- **No Difference 3-24m: Constant, DASH, ASES, SST**
- Risk 4x more OR with Operative Tx



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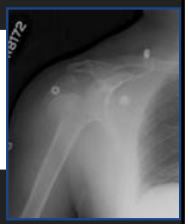
Uncertainty…

Difficulty in decision making in the treatment of displaced proximal humerus fractures: the effect of uncertainty on surgical outcomes

Joey LaMartina II, MD[a], Kaitlyn N. Christmas, BS[b], Peter Simon, PhD[b,c], Jonathan J. Streit, MD[a], Jesse W. Allert, MD[a], Jonathan Clark, MD[a], Randall J. Otto, MD[d], Adham Abdelfattah, MD[a], Mark A. Mighell, MD[a], Mark A. Frankle, MD[a,*]



- JSES 2017
- Surgery requires technical and decision-making
- Only 64% agreement experienced shoulder surgeons
- When uncertainty occurs for OIRF = patient outcomes suffer

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Case

82 year-old woman
Acute Fracture
Prior good function

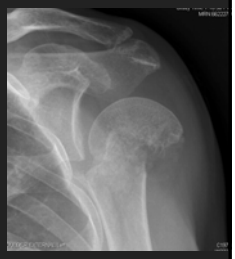
Factors to Consider

Patient characteristics

- Age: 82
- Medical comorbidities
- Osteopenia

Fracture characteristics

- How many parts (four?)
- Displacement
- High energy/low energy
- Comminution/Osteoporosis
- Joint congruity
- Risk of AVN



Reverse or Hemi for Acute Fracture?

Hemi
Bimodal
61% satisfied
FE 100, ER 25
Complication 8%
13% converted to RevTSA

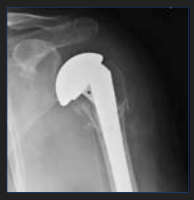
Reverse
- Unimodal
- 91% satisfied
- FE 139, ER 24
- Complication 8%

Cuff JBJS 2013

Hemi for Fx

66 pts, age 66 years
F/u 27 months

29 - very satisfied
9 – satisfied
28 – unsatisfied



Postop AFE = 101°, ER = 18°, IR = L3
50% Tuberosity Malposition/displacement

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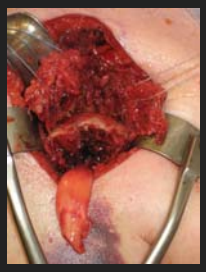
Boileau et al, JSES 2002

Technique: Control Tuberosities, Assess for Head



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Determining Humeral Stem Position

- Axial traction
- Calcar Stem relationship
- Jigsaw GT
- Pect 5.6cm to head

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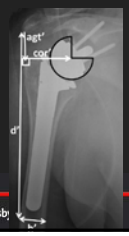
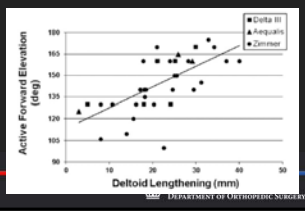
Reverse total shoulder arthroplasty for cuff tear arthropathy: the clinical effect of deltoid lengthening and center of rotation medialization

Charles M. Jobin, MD, Gabriel D. Brown, MD, Maher J. Bahu, MD, Thomas R. Gardner, MCE, Louis U. Bigliani, MD, William N. Levine, MD, Christopher S. Ahmad, MD*

Correct Tension = Better Motion





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What to do with Tuberosities: Resect?

Bufquin 2007 – Ave FE 97deg

Cazeneuve 2008

- High complication rate
- Tuberosities often removed = poor outcome

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Fix GT = External Rotation

Posterior Cuff: Infraspinatus / Teres Minor

Reverse + Greater Tuberosity ORIF

49-28 deg ER vs 12 deg ER

(Gallinett JSES 2013, Cuff ASES Specialty Day 2013, Bufquin JSES 2007)

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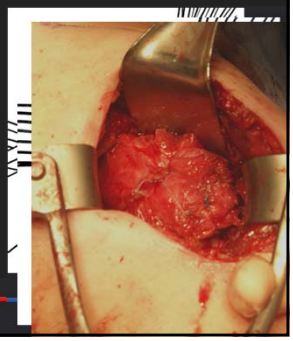
GT / LT Repair

- Similar to Hemi GT/LT Repair
- Vertical and Horizontal Sutures
- Tenotomy Supraspinatus
- LT for stability



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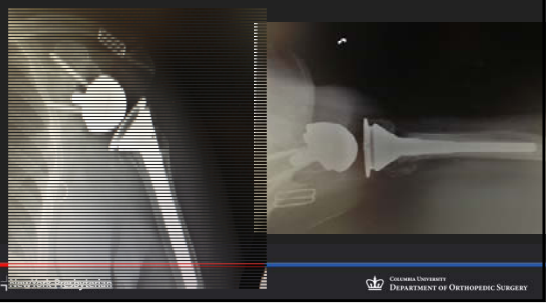
Case: Rev TSA for Fx
1 Year Post-OP



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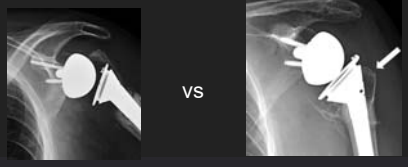
GT Healing

- GT Nonunion 53% (Mole et al. ASES Dallas 2007)
- GT Healing: better ER (Bufquin, JBJS Br 2007)
- Anatomically healed GT better (Gallinet, JSES 2013)
  - ER (49 vs 10 deg)



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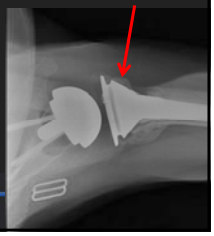
LT/Subscap- Important?

Stability?
- **Not better** (Clark JSES 2012, LOE 3)
- **Improved** (Edwards 2009 JSES, LOE 4)

Improved IR strength?

Reduced ER strength from IR tenodesis?

LT adds bone stock to prox humerus



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Case: Acute Fracture Reverse

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Reverse TSA for Fx

Technical Pearls:

Inferior baseplate placement

Larger glenosphere, deeper humerosocket = stability

Abx cemented stem, 20 retroversion

Excise Supraspinatus, keep Infra/TM

Suture Repair GT (vertical, horizontal, circumfential, cortical overlap)

Repair LT/Subscap if possible

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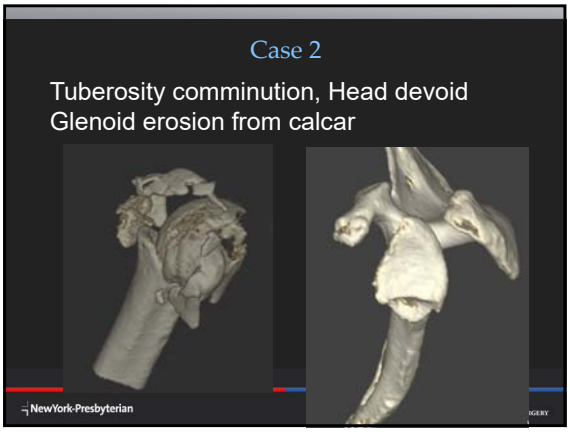
Case 2

68 year old, physiologically older
Fall 2 weeks ago, delay in seeking treatment

Case 2

Tuberosity comminution, Head devoid
Glenoid erosion from calcar

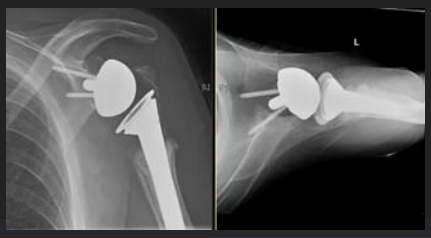


Case 2

Critical Evaluation of Implant Position!

Case 2

6 months post op, FE 90, ER 0, No Pain
Critical Evaluation of Implant Position!



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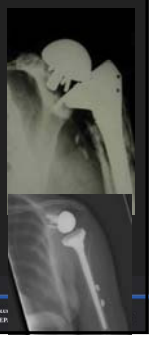
Reverse TSA for Fx: Complications

- **Dislocation 3-15%**
- **Heterotopic Ossification 12%**
- **Infection - rare**
- **Nerve injury- rare?**
- **Component loosening**
- **Acromial fracture ~5%**
- **Scapular Spine Fx with Superior Screw**
- **Scapular notching 30-70%**



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Plate, Hemi, or Reverse: Summary

If you care for fractures, you should be open to consider all options

Fix whatever you can

- Anatomic healing better than arthroplasty

Fracture characteristics

- Likelihood of successful fixation, AVN
- Stable reduction
- **Reverse is my preference over Hemi unless 50-60 years old…**

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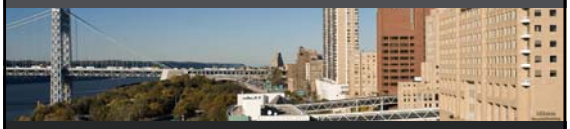
Thank You!



AMAZING THINGS ARE HAPPENING HERE

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