Reverse for Fracture

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Disclosure for T. Bradley Edwards, MD

a. Consulting/Royalty payments directly related to products discussed (Tornier)
b. Consulting/Royalty payments for other products from the same company as the products discussed (Tornier)
c. Research or other financial support from the same company as the products discussed (Tornier)

Introduction

- 3-part and 4-part fractures
- Difficult indication
- Results unpredictable

Hemiarthroplasty

Series	Number of Patients	Active Elevation (°)	Painful Shoulder (%)
Neer	61	NA	9
Huten	34	90	26
Tanner	16	101	75
Frich	21	77	NA
Moeckel	22	119	23
Piétu	21	109	66
Hawkins	19	72	58
Compito	64	127	66
TOH	21	97	25

Hemiarthroplasty

- Results are disappointing
- Why?

Hemiarthroplasty

- Multicenter study 2001
  - 300 patients
  - 103° elevation
  - 19% painful
  - Prognostic factors
    - Tuberosity complications
    - Age
      - Young patient → good result
      - Old patient → bad result

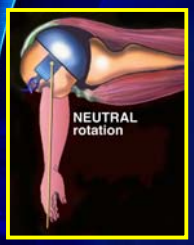
Problems

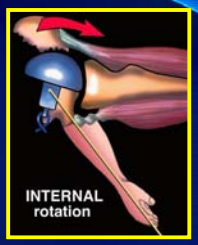
- Prosthetic positioning (height, version)
- Ill adapted prosthesis (excess metal proximally)
- Poor tuberosity fixation
- Poor biology

Prosthetic Positioning

- Excessive height leads to greater tuberosity migration

Prosthetic Positioning





- Excessive retroversion leads to greater tuberosity migration

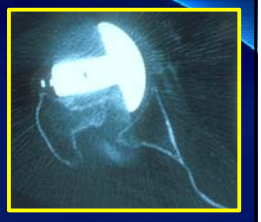
Prosthetic Positioning



- Trial reduction difficult
- Solution → ancillary instrumentation/techniques

Ill Adapted Prosthesis

- Excess metal in metaphyseal region obstructs proper positioning of greater tuberosity
- "Rocking" phenomenon



Ill Adapted Prosthesis


- Solution → lower profile prosthesis without coronal fin

Poor Tuberosity Fixation

- No reproducible technique
- Poor bone quality

Poor Tuberosity Fixation

- Reproducible fixation technique
  - 4 horizontal cerclage sutures
  - 2 vertical cerclage sutures
  - No sutures through prosthesis
  - Polished medial neck

Poor Biology

- Poor bone quality solution → bone graft

Poor Biology

- Poor bone quality
  - Age related
  - Osteoporosis

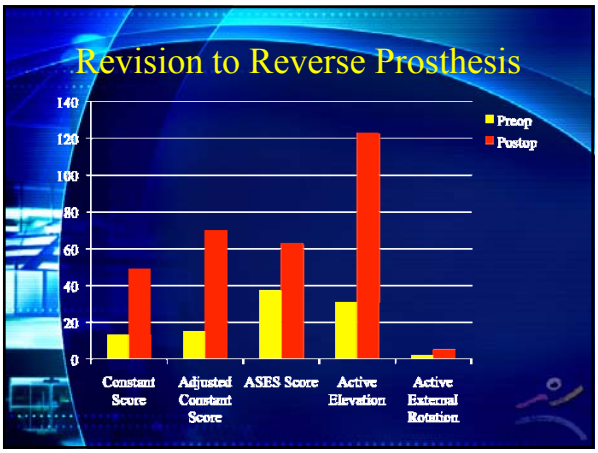
?

What if the Tuberosity Does Not Heal?

Tuberosity Failure

- Revision to reverse prosthesis

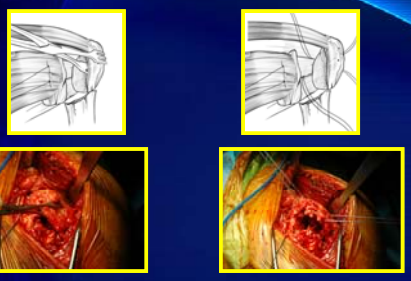
Revision to Reverse Prosthesis



Indications for Reverse

- Why not just eliminate the "primary arthroplasty" in patients at risk for tuberosity failure?
  - Displaced 3-part and 4-part fractures
  - Age > 70 years
  - Severe osteopenia

Reverse Surgical Technique



- Tuberosities handled identical to unconstrained case

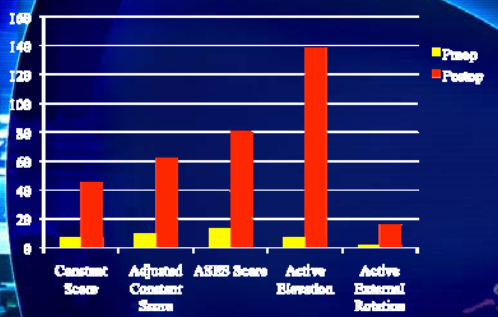
Reverse Surgical Technique

- Trial implant "telescoped" to the glenosphere
- Maximal traction placed on arm
- Trial height marked

Reverse Surgical Technique

- Final implanted cemented
- Trial reduction for tension
- Boileau technique for tuberosity fixation

Results



Reverse Prosthesis




- 4 years postoperative

Reverse Fracture



- Tuberosity fixation
- Tuberosity healing
- Better external rotation
- Better instrumentation

Summary

- Advances in shoulder arthroplasty techniques, instrumentation, and implants have lowered tuberosity complication rates
- Poor bone quality (poor biology) remains a problem in certain cases and can inhibit tuberosity healing
- Reverse shoulder arthroplasty is an attractive alternative to hemiarthroplasty in select patients with proximal humeral fractures


Thank You