

PROXIMAL HUMERUS FRACTURES

What Works???

What doesn't work??

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I. WHAT ARE WE TALKING ABOUT: CLASSIFICATION?

- Poor Interobserver variability with any system
- Poor Intraobserver variability with any system
- "Displacement" is difficult to assess consistently
- Bone quality is usually ignored.
- Individual patient is not part of classification
- Tends to overestimate severity of some fractures (i.e. 4-part valgus impaction)
- Tends to underestimate severity of some fractures (i.e. anatomical neck fracture)
- Goals are to have useful guideline for treatment based on prognosis for vascularity of articular segment and positioning of parts of fracture.

II. OVERVIEW OF WHAT DOES NOT WORK:

- Rigid internal fixation of poor quality, osteopenic bone often does not work well.
- Excessive soft-tissue stripping to achieve rigid fixation may increase risk of AVN if dissection occurs in region of bicipital groove.
- Accepting a malunion between the tuberosities and the head may be associated with poor function.

- **Accepting a malunion between the tuberosities may make subsequent arthroplasty surgery very difficult and may compromise ultimate function.**
- **Percutaneous pinning done poorly is better not done at all.**
- **Conservative treatment of a distal surgical neck fracture has a 20% incidence of nonunion.**
- **Intramedullary fixation may have fail to control torsional rigidity and may result in nonunion.**
- **Intramedullary fixation may compromise rotator cuff**

III. OVERVIEW OF WHAT DOES WORK:

- **Good orthogonal x-rays are prerequisite for good decision-making.**
- **Occasionally CT-scan can improve accuracy of diagnosis and decision making (i.e. impaction fracture of humeral head)**
- **In some cases a 2-part fracture in elderly osteopenic bone is better treated with a hemiarthroplasty**
- **Closed reduction and percutaneous pinning is a good alternative in treating 2-part fractures and some 3-part fractures with good quality bone.**
- **Blade plate fixation is a good method of treating 2- and 3-part fractures with metaphyseal-diaphyseal comminution through methods of indirect reduction without need to dissect in bicipital groove.**
- **AVN may be well tolerated if tuberosity fixation results in an anatomical relationship with the articular humeral surface.**
- **Malunion of the surgical neck may be well tolerated, except for varus malunion which usually results in loss of motion.**
- **Corrective osteotomy of extra-articular malunion usually gives good results.**
- **Age is a negative prognostic factor for any form of treatment...this correlates with the quality of the bone (MOST IMPORTANT FACTOR)**
- **KEY POINT: What works for me best....may not be what works for you best.....i.e. I use a 3-wood and you use a driver...It only matters who winds up in the fairway...**

IV. SPECIFIC CASES:

- A. 1-PART FRACTURE (Impacted): Initial rest for one week then immediate passive ROM for 2-3 weeks...then active ROM.**
- B. 2-PART SURGICAL NECK FX (displaced):**
 - ✓ **Good quality bone: Closed Red and Percut. Pinning.**
 - ✓ **Good quality bone + comminution: ORIF with blade plate**
 - ✓ **Poor quality bone: Blade plate**

- C. **2-PART GREATER TUBEROSITY FX (displaced): ORIF through superior approach with transosseous suture fixation**
- D. **2-PART LESSER TUBEROSITY FX (displaced): ORIF through deltopectoral approach.**
- E. **3-PART FRACTURE:**
 - ✓ **Good quality bone in young patient: CRPP or ORIF with brace plate or screws and pins.**
 - ✓ **Poor quality bone in older patient: Immediate Hemiarthroplasty**
- F. **4-PART FRACTURE:**
 - ✓ **Young patient with good bone: Attempt ORIF but must make it anatomical**
 - ✓ **Valgus-impacted fracture: CRPP or ORIF with pins or screws and bone grafting.**
 - ✓ **Older patient with poor bone: Immediate hemiarthroplasty with proper preoperative planning....**
 - ✓ **1. Template contralateral side for length restoration**
 - ✓ **2. Template contralateral side for head size (offset)**
 - ✓ **3. Plane for bone grafting needs.**
- G. **HEAD-SPLIT FRACTURE:**
 - ✓ **Young patient with reconstruction possible: ORIF**
 - ✓ **Older patient or young patient with comminution: Hemiarthroplasty**
- H. **IMPACTION FRACTURE OF HEAD: Hill-Sachs or Reverse Hill-Sachs.**
 - ✓ **Good quality bone and < 40%: Allograft reconstruction**
 - ✓ **Poor quality bone or > 40%: Hemiarthroplasty**