Treatment of common geriatric fractures: Wrist

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Disclosures

- I have nothing to disclose.
Distal radius fracture (DRF)
DRF: Epidemiology

- ~ 20% of all fractures treated in ED
- Adolescents/Young Adults
  - High energy injuries (MVC, fall from height)
- Elderly
  - Low energy injuries (fall from standing)
  - Incidence correlates with osteopenia
Distal Radius Fractures in Elderly

- 2nd most common fracture occurring in the elderly, after hip fractures
  - DRF are the most common upper extremity fracture in patients over the age of 65 years.
- 50% increase in relative risk of sustaining a hip fracture
- As the population ages, the incidence of osteoporotic DRF increases
  - Over 80% of all fractures in people 50+ are caused by osteoporosis
- As many as 372,000 people over 65 sustain a DRF in US yearly
- Decreased survival among DRF patients
  - 57% vs 71%
DRF: Mechanism

- Mechanism – fall on hyper-extended, radially deviated wrist with forearm in pronation
DRF: Colles’ Fracture

- >90% of distal radius fractures
- Originally used to describe extraarticular fractures
- Dorsal tilt, dorsal displacement, radial shift, radial shortening
- Mechanism – fall on hyper-extended, radially deviated wrist with forearm in pronation
DRF in elderly

- Poor bone quality, low bone mineral density (BMD)
- Comminution
- Direct correlation between BMD and the severity of DRF

Clayton, 2009
Osteoporosis

- Characterized by loss of bone mineral density (BMD)
- Increases the risk of fracture after low-energy trauma
- Increased risk of DRF in patients with low BMD
- As the BMD decreases, the severity of distal radius fracture increases
- Treatment for osteoporosis after DRF can decrease the risk of a subsequent fragility fracture.
  - women treated with osteoporosis with bisphosphonates can reduce the relative risk of fracture of the hip and distal radius
Treatment Options

- Closed reduction and casting
- External fixation
- Percutaneous pin fixation
- Open reduction, internal fixation

Determined by fracture pattern, degree of displacement, stability, patient age and physical demands
Treatment Options

- Importance of Anatomical Reduction
  - Articular incongruity
    - Pain, stiffness, degeneration
  - Dorsal tilt
    - Decreased contact area of radiocarpal articulation
    - Incongruent DRUJ
    - Tightening of interosseous membrane
  - → Pain, midcarpal instability, post-traumatic OA
DRF Elderly: What we know

1. Fractures displace in the elderly
2. Radiographic appearance does not affect functional outcome
3. Marked deformity/ severe fracture displacement has been shown to adversely affect functional outcome
Nonoperative Treatment

- Mainstay of treatment for stable, nondisplaced fractures
- Padded splint with wrist in neutral, MCP joints free
- 3-point molding
1. Fracture displacement

- Risk for displacement increases after closed reduction as age increases
  - If >58 years, 50% risk of displacement

Table 2. Percent Risk for Displacement Based on Age and Time From Reduction

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>After Reduction</th>
<th>1 Week After Reduction</th>
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</thead>
<tbody>
<tr>
<td>30</td>
<td>17%</td>
<td>6%</td>
</tr>
<tr>
<td>40</td>
<td>27%</td>
<td>10%</td>
</tr>
<tr>
<td>58</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>70</td>
<td>66%</td>
<td>42%</td>
</tr>
<tr>
<td>80</td>
<td>77%</td>
<td>57%</td>
</tr>
</tbody>
</table>

Nesbitt, 2004
3.5 weeks

loss of reduction

20°
2. Radiographic appearance does not affect functional outcome
Radiographs and Functional Outcomes

- Sedentary, low-demand >60 (RR, 25 patients)
- Overall satisfaction, ability to return to previous activity level or occupation, concern over wrist appearance, functional task questionnaire
  - 68% good- excellent results, 8% fair, 24% poor
- Radiographic outcomes did not correlate with functional outcome

Young and Rayan, 2000
Radiographs and Functional Outcomes

- Prospective study, >50 yr with cast-treated DRF
- Only measured dorsal/volar tilt
- DASH, SF-12, patient satisfaction survey
- Radiographic outcomes did not correlate with functional outcome OR satisfaction

Anzarut, 2004
So, treat them all non-operatively???
3. Marked deformity has been shown to adversely affect functional outcome

- Radial shortening > 6mm
- >10° dorsal angulation with 2mm shortening ➔ weak, stiff, painful wrist (>69 y/o)

McQueen, 1988
Fujii, 2002
A Systematic Review of Outcomes and Complications of Treating Unstable Distal Radius Fractures in the Elderly

- Management of DRFs in patients aged 60 and over with 5 common techniques

- Outcomes: ROM, grip strength, functional outcome measurements, radiographic parameters, and complications

- 2,039 papers and selected 21 papers

- Conclusion: Despite worse radiographic outcomes of cast immobilization, functional outcomes were no different from those of surgically treated groups for patients age 60 and over

Chung et al, JHS
ORIF

**Advantages:**
- Makes XR look better
- Earlier ROM
- Equivalent outcomes at 1 year

Orbay, 2004
What about rate of recovery?

- The rate of recovery and limitations of ADLs during treatment affect QOL.
- Jeudy et al: >65, better clinical outcomes up to 6 months with ORIF (vs exfix)
- Compared with younger patients, the elderly already experience a delay of approximately 6 months in gaining functional improvement.
- Is the rate of recovery rather than the final functional outcome more important when deciding treatment strategy?
My thought process

- **Assess patient**
  - Age, comorbidities, function
    - Sedentary, vs active
    - Cosmesis

- **Assess fracture**
  - Is the carpus lying over the radius?

- **Fracture management**
  - Non-operative: Qweek xr x 3 week, →6 wk cast
  - Operative: ORIF vs Bridge Plate
Prevalence of osteoporosis in patients with DRF is high

Osteoporosis is a risk factor for DRF in both men and women

Patients of both sexes with an age ≥ 50 who have a DRF should be evaluated with bone densitometry for the possible treatment of osteoporosis.
References


