Complications of Distal Radius Fractures
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How to Treat a Distal Radius Fx
• Need to restore motion, begin with uninvolved parts
• Need to reduce an unreduced fracture
• Need to maintain the reduction
• Need to place fixation appropriately

KL
• 46 yo RHD woman left distal radius fracture on 9/17/15 from a fall
• Closed reduced and placed into a cast
Anatomy: Radiology

• Ulnar Variance 0.32mm (+3 to -4)

Anatomy: Radiology

• Ulnar (Radial) Inclination

• 20°

Anatomy: Radiology

• Dorsal v Palmar Sigmoid Notch

• 7 Degrees
Anatomy: Radiology

• Palmar Tilt (Sagittal Tilt)
• 10 degrees (0-28)

Unstable Fracture

• Lafontaine (repeated what Frykman said)  
• Dorsal angulation > 20 degrees
• Dorsal Comminution > 1/3 Width on Lat. X-ray
• Intra articular Fx
• Ulnar fx
• > 60 y/o

Pre-reduction X-ray

• Significant dorsal comminution is indicative of likely post-reduction displacement
What is Unstable/Displaced?

- Lafontaine (repeated what frykman said)


Colles’ Fracture Problems

Goal of Treatment

- 1. Restoration of bony anatomy
  - Articular congruency
  - Volar tilt
  - Radial length
Goal of Treatment

II. Repair Soft tissue injuries
   – Intrinsic ligament injuries
   – Radioulnar stability
   – Capsular injuries and potential for scarring
   – Neurologic injuries

Goal of Treatment

III. Restoration of motion
   – First – Begin before surgery
     • Digital
     • Shoulder
   – Second
     • Wrist
     • Forearm

9/25/15 Reduced?
KL

- Closed reduction not successful
- Brought to OR for operative intervention

External Fixation and Percutaneous Pinning

Percutaneous Pinning
KL

- Pins in for 8 weeks
- Cast maintained 2 weeks due to concerns for fracture healing
- When cast removed, begins OT

11/16/2015

KL 12/15/17

- First visit with me
- Problems
  - Pain
  - Swelling
  - Difficulty with ROM of fingers, wrist, and forearm
KL 12/15/17

• PE
  – ROM
    • Sup/Pron – 0/60
    • Wrist Ext/Flex – 0/20
    • Finger
      – MP 0/40
      – PIP 40/80
    – Negative Tinel’s sign over wrist (CPRS Type 2)
    – 5 mm 2 point

12/15/16

KL 12/15/17

• Problems
  – Stiffness of fingers
  – Malunion of distal radius
• Plan
  – OT to restore ROM of digits
KL 1/14/16

• TAM of each digit improved 40-60 degrees
• Pain and swelling have decreased
• OR for osteotomy
• ISSUES:
  – Palmar or dorsal approach?
  – Autograft or allograft?

12/15/16

1/25/16
• Problems after surgery
  – Wrist ROM 0/60, pain with motion past 15 degrees of extension
  – Sup/Pron 20/70
  – Tightness of the digits
• Cast wrist in maximum extension
• OT for ROM of digits
How to Treat a Distal Radius Fx

- Need to restore motion, begin with uninvolved parts
- Need to reduce an unreduced fracture
  - Initially displaced fracture is a “Fracture of Necessity”
- Need to maintain the reduction
- Need to place fixation appropriately
Problems

- Aching sensation of wrist
- Loss of supination
Distally angled pegs neutralize dorsal forces

Volar buttress neutralizes volar forces

Complications - Incomplete Reduction of Fracture

- Persistently dorsally displaced or angulated
- Leads to prominence of distal plate at watershed line
Complications by the Steps of the Procedure

- Intra-operative - Plate too distal
- Flexor tendon irritation/rupture

Correct Placement of Hardware - Plate Too Proximal

Correct Placement of Hardware

- 32 yo female massage therapist
- S/p ORIF of distal radius
  3 months ago
- Restricted, painful supination
- Placed in dynamic forearm brace
Intra-Articular Screw Placement

Complications – Screws Too Long

- Irritation of extensor tendons
- EPL most commonly ruptured
- Causes, Benson (CORR 2006)
- Postreduction bone spurs
- Dorsal gapping
- Prominent screw tips
Complications – Screws Too Long

- Difficult to determine screw length intra-operatively, Greenberg (J Hand Surg Am 2009)
- Fluoroscopy sensitivity in detecting cortical penetration
  - 82% sensitive in the radial-most position
  - 77% sensitive in the central position
  - 57% sensitive in the ulnar position

Complications – Screws Too Long

- Treatment
  - High index of suspicion
  - Undersize locking/screw peg
  - Remove hardware if irritation occurs

Complications – Screws Too Short

- Poor support with subchondral bone
- Locking screws/pegs need to be in contact with dorsal subchondral bone
- Locking screws/pegs need to be at least 75% of the AP diameter of the subchondral surface
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THANK YOU