Client centered approach to distal radius fracture management

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Disclosures

• Sadly, no financial disclosures
Objectives

- Review of anatomy, common fractures of the distal radius, fixation methods, and precautions
- Understanding the therapeutic approach for acute care and outpatient management of distal radius fractures
- Special considerations in distal radius fracture management
Wrist Anatomy
Examples of Distal Radius Fracture Types*

- Colles’
- Smith
- Barton
- Galeazzi
- Chauffeures

*not a comprehensive list
Colles’ fracture

- Complete fracture of the distal radius with dorsal displacement of the distal fragment and radial shortening
Smiths fracture

- Complete fracture of the distal radius with palmar displacement of the distal fragment
Barton’s fracture

• Intra-articular fracture of the distal radius with dislocation of the radiocarpal joint. This fracture can be either dorsal or palmar.
Galeazzi fracture

- Fracture of the distal 1/3 radius with a dislocation of the DRUJ
Chauffeur's fracture

- Intra-articular fractures of the radial styloid process. The radial styloid is within the fracture fragment, and the fragment can vary in size.
Fixation methods

• Closed: fracture set in proper alignment without use of surgery. Can include plaster/fiberglass/thermoplastic splinting
• Open: alignment of fracture through open surgical intervention. Can include k-wire, tension bands, intramedullary devices, screws/plates, and bone grafts
Current Research

• The most recent Cochrane review covering 26 studies and 1269 patients led to the conclusion that there is no conclusion on treatment of wrist fractures
Precautions and Questions for the Doctor

- Age and occupation
- Cognitive ability to follow rehab program

Questions for the Doctor
- Is there a disruption in the length or inclination of the radius and/or ulna?
- Is the TFCC injured?
- Are AROM parameters restricted in any way to any aspect of the involved upper extremity?
- What is preferred protocol for rehab and any wound/pin care?
- When will the hardware be removed, if at all?
- Are there any specific soft tissue considerations?
- Is there preexisting arthritis that can affect the patients rehab?
Acute care management of the distal radius fracture
Treatment Focus during Initial Immobilization

• Communication between the therapist and MD

• Initial aspects of treatment shoulder focus on:
  – Normalization of edema
  – ROM of non-immobilized joints
  – Scar management
  – Wound care
  – Pain management
Normalization of Edema

• Keep wrist elevated, preferably above the heart, when at rest
• **Avoid** use of slings. Slings can cause a protected posture that can lead to frozen shoulder, increase hand edema, and contracture of the elbow
• Complete AROM exercises, including above the heart, to assist with venous and lymphatic outflow
• Retrograde massage: first with AROM then light pressure distal to proximal
• Compressive dressings
ROM of non-immobilized joint

• ROM on free joints should begin as soon as possible, barring any additional precautions per MD
• Frequent ROM throughout the day is preferred to fewer, longer duration sets
• ROM should be pain free
• Proximal ROM should be included to avoid elbow/shoulder deficits
Scar Management/Wound care

• Complete wound/pin care per MD instructions
• Educate patient on signs of infection
• Gentle scar massage (with incision line approximation) and tendon gliding
• Topical scar compression dressings can be applied 48 hrs after suture removal/when eschar is gone/incision line is approximated
• Desensitization program
Treatment focus after immobilization

• Plan of care will be depending on clearance from MD and patient specific protocol/stability of fracture

• Aspects of treatment should focus on:
  – AROM progressing to PROM of wrist
  – Custom/pre-fab wrist splint
  – Strengthening
  – Return to functional activities and ADL/IADL tasks
ROM of the wrist post immobilization

• Depending on stability of fracture, initial ROM will be active, progressing to passive. Clear communication with the MD is important for progression of ROM due to individual, patient specific nature of fracture and healing time
• ROM should always be pain free
• Educate patient on not overdoing HEP and home stretching program
ROM cont...

• Initiate slow ROM to the EPL if the radial fracture involved Lister’s Tubercle. Check anatomical snuffbox for pain with EPL extension

• ROM of digits should target MCP flex, IP flex/ext and thenar web space

• Supination/pronation can be greatly affected, especially with DRUJ involvement. Support carpals when supinating to avoid carpal ligament laxity

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ROM cont...

• Differential tendon gliding for reduction in adhesion. Isolation of FDS, FDP, extensor digitorum, wrist extensors, intrinsics

• Focus on wrist extensors by having patient complete wrist extension with IP flex to disengage extensor digitorum

• Complete functional tasks that are meaningful to the patient in addition to static/dynamic stretching
Functional ROM Tasks

Dart Throwing Motion

Constrain-Induce Movement Therapy (CIMT or CI)
Splinting

• After MD removes casting, a removable forearm based wrist splint can be fabricated or a prefabricated splint can be issued for intermittent use, depending on healing of fracture and specific requests from referring MD

• A TAP splint can be requested for persistent deficits in supination and pronation

• Dynamic/static progressive splinting can be used for patients who plateau in reaching their functional ROM for wrist/digit movement

• Educate the patient on wear schedule and need to not rely on splint as treatment progresses
Strengthening and Return to Function

• Do NOT start strengthening until cleared by the referring MD
• With gripping, 80% of load carried through the carpals is transferred through the radius, and 20% through the ulna via the TFCC
• Start slow and pain free
• Incorporate functional tasks that can be graded up/down, and educate the patient on how the tasks can be translated to their specific ADL/IADL needs
Special considerations in distal radius fracture management

• Proximal joint deficits: frozen shoulder and contracture of elbow

• CRPS: watch for increased sympathetic activity and vasomotor instability. Increased sweating, disproportionate pain, shiny/brawny skin, warmth and stiffness, discoloration. Inform MD if CRPS is suspected to develop treatment plan.

• Traumatic arthritis due to poor articular congruency: educate patient on compensatory strategies and environmental adaptations to assist in pain free completion of tasks and joint protection
Examples of CRPS
Special considerations cont...

- Tendon rupture: both extensor and flexor tendons can be affected
- Compression of the median and ulnar nerve
- Malunion: extra-articular, intra-articular or both. A shortened radius can lead to increased force transmitted through the TFCC and ulnar carpus/styloid, possibly causing ulnocarpal abutment syndrome
- Infection: result of k-wire fixation, external fixation or ORIF

