Fracture Management for the Elbow, Wrist and Hand

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Fractures to the Proximal Radius
MOI: FOOSH with forearm in pronation
Associated injuries include:
Carpal fractures
DRUJ
Interosseous ligament
TFCC

Classification of Radial Head Fractures
Type I: Non-displaced
Forearm rotation limited only by pain and swelling
Intra-articular displacement is < 2 mm
Classification of Radial Head Fractures
Type II: Displaced > 2mm fracture of the head or neck
Motion may be mechanically limited
W/O severe comminution can be repaired by ORIF
Fracture involves more then the lip of the radial head
Classification of Radial Head Fractures
Type III: Severely comminuted fracture of the radial head or neck
Not reconstructable
Will require excision for movement

Signs/Symptoms
Pain on the lateral side of the elbow aggravated by forearm rotation

Motion may elicit crepitus
If wrist pain is present assess for possible radioulnar dissociation with injury to the IOL and the TFCC

Therapeutic Management of Radial Head Fractures

Phase I

Posterior Elbow splint
Elbow at 90^0
Wrist Neutral

HEP
May take off periodically 4-5X/day
No forearm rotation

Phase II

Early Mobilization
Begin PT/OT program
AROM/PROM
Soft tissue mobilization

Edema control
Compressive sleeves

Supportive Modalities
Moist heat
Cryotherapy

Phase III

Continue with A/PROM
May begin PRE's
Supine over towel roll

Night extension splinting may be necessary

Wrist Fractures

Therapeutic Management

Phase I

Priorities are edema control, pain control, and ROM of all uninvolved joints

Reduction of edema is of primary concern because of the complications that excess edema can cause

Intrinsic/Extrinsic tightness

Phase II

Begun once fracture is stable and cast or ex-fix is removed

Continue with edema control, emphasis now on composite motion of digits now that digits and thumb are free to move

Primary focus is restoring independent wrist extension.

Splinting may be utilized for protection and comfort.

Phase III

Begun when the fracture is healed and can withstand passive force

Initiation of light resistive activities for grip to encourage full excursion of the flexor tendons

Progress the patient to tolerance. More intensive modes of TE can be employed (i.e., Jt mobs, dynamic splinting, or Static Progressive,either for wrist, digits or both.)

Splinting and the Concept of Low Load Prolonged Stress

"Weeks Principle"

Measure Cold
  Heat for 10 minutes, then go through exercise routine
  Increase of 15 degrees = Static Splint
  Incrrease of 10 degrees or < = Dynamic Splint
  Increase of 5 degrees or < = Static Progressive Splint

Complications Associated with Distal Radius Fractures

Assessment of Complications: Key Points
Early Intervention
  "Round up the usual suspects"
   CTS, CRPS, Edema, Tendon Adherence, Proximal Joint Involvement
Low load prolonged stretch(LLPS) treatment of choice
  Functional ROM requirements 30^0-130^0
  Muscle Re-ed (ECRL & ECRB)

Carpal Fractures

Most Commonly Fractured Carpal Bones
Scaphoid Fracture
   Account for 60-70% of all carpal fractures
     5-20 weeks of healing time depending on the level
     Most fractures occur at the waist and heal in 10-12 weeks
Fracture of the Hook of the Hamate

MOI: fall on the palm, or direct blow from the handle of a racquet

Treatment: Excision

Lunate dislocation

Therapeutic Management for Carpal Fractures

Phase I: While casted, ROM to all Uninvolved Joints

Phase II: Protective splinting utilized. Start when fracture is stable. Focus on wrist, thumb, and composite flexion

Phase III: Fracture fully healed. May require dynamic splinting and more aggressive techniques to regain motion to wrist and thumb depending on which carpal bone has been fractured. PRE's started at this time

Hand Fractures

Metacarpal Fractures

Boxer's Fracture

Most common fracture

MOI: compressive force(direct blow)

Bennet's Fracture/Dislocation

Occur less frequently

Mostly occur at the base

Most common Intrarticular fracture of the thumb

MOI: Axial Blow against a flexed Metacarpal(fist fight)

Therapeutic Management for Metacarpal Fractures

Phase I: Edema control and Immobilization.

Phase II: Fracture is stable. AROM only at the MCP level.

Phase III: fracture is healed, as determined by MD. PROM at all Joints. Dynamic splinting for joint or tendon tightness.

Proximal and Middle Phalanx Fractures

MOI: Fall of direct blunt trauma

More difficult to treat than MC fractures because of associated tendon injuries

Proximal Phalanx more common than middle phalanx fractures.

Usually occur on radial side of hand; proximal and midshaft area's frequently involved

Therapeutic Management of PIP Fractures

Phase I: Attention to Edema, Pain and Immobilization. Use of coban Wrap

Phase II: Mobilization begun between 3-15 days after reduction for extra-articular, non-displaced, stable and ORIF fractures.

Phase III: Fracture healed, may begin PROM. Dynamic splinting may be needed.

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