Slip, Fall, Broken Wrist!
A Fracture Everyone Treats
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Distal Radius Fractures

- Most common UE fx
  - 1 out of 6 fractures seen in ER
  - 3rd most common fracture
- High morbidity rate. One study found that only 2.9% of Colles’ fractures had NO permanent disability
- Often associated with concomitant pathology
  - CTS, CRPS, stiff hand, etc.

Statistics of Distal Radius Fractures

- More common in women
- Increase with advancing age
- Occur most often from low-energy trauma (falls from level ground)
- Epidemiologic trends show increase in more complex, unstable distal radius fractures from high-energy injuries, sports, and MVAs.

Common Classifications for distal radius fractures

- Melone
- Frykman
- Mayo
- A.O.
- There are over 20 classifications!

Classification Systems

- No one system describes all fracture patterns, considers degrees of comminution, and is of consistent prognostic value.
- Knowing these systems may enhance communication with surgeons

Melone Classification

- describes progressively worsening comminution and displacement
- suggests treatment based on classification
- divides distal radius into four parts: shaft, radial styloid, dorsal medial, and volar medial
Frykman Classification

1-8

Higher-classification fractures have worse prognoses

Mayo Classification

- underscores specific articular content areas
- describes whether fracture is displaced or nondisplaced, reducible or irreducible, and stable or unstable

AO Classification

(Comprehensive classification of fractures)

- Divides into three basic types
  - A: extra-articular
  - B: Simple articular
  - C: Complex articular
- Each type is subdivided into 27 subgroups
- Detailed, descriptive, very complex

Patterns of Distal Radius Fractures

- Colles'
- Smith's
- Barton's
- Chauffeur's
- Lunate “die-punch” fracture

TIP: Often "Colles' Fracture" is used as a generic term for all distal radius fractures

Colles’ fracture

- Fx. of the distal radius with DORSAL angulation of distal fragment
- Most commonly caused by FOOSH (fall on outstretched hand)
- Tx. Goal: restore radial length and joint congruity

Smith’s fracture

- Fx. of the distal radius ("reverse Colles")
- Volar angulation of distal fragment
- caused by falling onto flexed wrist
- Less common than Colles' fractures.
- Immobilized in supination (40 degrees) with the wrist in 30 degrees of extension
A way to remember the fracture patterns

- **Colle’s fracture**: arm in fall position makes a ‘C’ shape.
- **Smith’s fracture**: arm in fall position makes a ‘S’ shape.

**Barton’s**

- Barton’s
  - Displaced and unstable fracture subluxation of the distal radius with the carpus following the articular fragment
  - Dorsal and volar types
  - Many require ORIF

**Dorsal Barton’s**

- Dorsal Barton’s have a dorsal fragment and correlate with the Colles’ fractures

**Volar Barton’s**

- Intra-articular volar fragment
- Correlates with Smith’s fracture

**Chauffeur’s**

- Fx. of the radial styloid (intra-articular)
- Usually managed with pinning
- Can be associated with S-L injuries
Lunate “die punch” fracture

- Intraarticular depression of the lunate fossa into the distal radius
- Allows proximal migration of the lunate and/or proximal row
- Managed with elevation and bone grafting

Stable vs. Unstable
What does this mean?

**Stable:**
- Less angulation or displacement
- Minimal comminution
- Do not usually involve radiocarpal joint or DRUJ

**Unstable:**
- Displaced, comminuted, may involve DRUJ with or without fracture of distal ulna
- May extend into radiocarpal joint with lateral displacement of the radial styloid

Physician Management of the fracture

- Closed reduction
- Percutaneous pinning
- External fixation
- Open reduction with internal fixation (plate and screws)
- Depends on comminution, displacement, and angulation

Closed Reduction Of Distal Radius Fractures

- Closed reduction = no/minor comminution with minimal articular components.
- Reduced and placed in appropriate positions
- Cast is applied (cast must clear the distal palmar crease to allow full MP motion)
- Used less commonly due to advances in surgical procedures

Percutaneous Pinning

- Can be added after reduction to provide additional stability to the reduced fragments
- Usually 6-8 weeks
- Intrafocal Pinning (Kapandji)- the K-wire is directed into the fracture site and used as a lever to put the displaced fragment into alignment

Arthroscopic Assisted Fixation

- Good choice for fractures that don’t have extensive comminution
- Good to use when suspected ligament injury exists
- Radial styloid fractures (also have a high incidence of SL injuries that goes along with them)
- 3 part fractures
- 4 part fractures (more difficult)
- Is becoming more standard for surgeons to use this technique
Role of External Fixation
- There are circumstances when a fixator is still used
  - Unstable fractures with significant metaphyseal comminution to correct radial length
  - When the fracture extends proximally up the radius too far for plate to get adequate purchase proximally
  - Open grossly contaminated fractures which are being temporarily stabilized

External Fixation
- Used either alone or in conjunction with percutaneous pinning as fixator alone can’t correct palmar tilt, radial translation or reduce the lunate fossa
- Principle of all external fixation is based on "ligamentotaxis" – fragments are aligned by traction across fracture site.
- Can have complications: median neuropathies, irritation of DSBRN, finger stiffness, pin infections

Non-bridging External Fixation
- Allows immediate early motion of the wrist (see photo next slide)
- An excellent treatment option for extra-articular distal radius fractures or non-displaced fractures with mild to moderate comminution
- Contraindicated for severe comminution or osteoporosis
- Conventional external fixation involves placing the distal pins into the first metacarpal (pins span the wrist joint)
- Non-bridging fixators do not span the joint but rather are placed into the distal fracture fragment and do not cross the wrist
- They are not using ligamentotaxis to treat the fracture
ORIF (Open Reduction, Internal Fixation)

- The benefits of ORIF are to allow stable fixation of unstable fractures and to allow for early mobilization
- Plating can be dorsal or volar
- This technique is more popular than other methods
- Very often will go in a custom-fabricated orthosis and begin early ROM after surgery

Volar vs. Dorsal Plating

- **Volar plating**
  - Less likely to have dorsal tendon scarring and subsequent rupture
  - Protects blood supply
  - Less pain and more motion
  - Plating on the suboptimal side of the fracture
    - Locking technology has helped overcome this problem
- **Dorsal plating**
  - Fixation on the optimal side of dorsally angulated fractures
  - Favored in the absence of locking technology
  - Still useful in distal radius malunion correction

Regardless of Method Used for reduction…

- The physician must adhere to principles of adequate reduction and attempt to restore:
  - Articular congruency
  - Radial length
  - Volar tilt
  - Radial inclination
  - Assess DRUJ instability and treat if necessary

Normal Inclination and Tilt

- Radial Inclination (22 degrees)
- Palmar Tilt (11 degrees)
Radial Height (length) Normal is 12 mm and No Ulnar Variance

Residual deformities to know

- **Loss of radial tilt or inclination** – normal is 22-33 degrees
  - May cause decreased UD and grip strength with a decrease of 5-10 degrees
  - Wrist may appear radial deviated if inclination is less than 15 degrees
- **Loss of palmar tilt - Dorsal angulation** – normal palmar tilt is 11-12 degrees
  - Silverfork deformity
  - Ulnar sided wrist pain due to load shift - TFCC
  - Loss of palmar tilt is thought by many to be the most important aspect of radial malunion

Continued…

- **Radial shortening (decreased height)** – normal is 12 mm
  - Decreased grip strength and can affect pronation
  - **radial shortening** may be the most important factor in the development of symptomatic malunion
  - Radial shortening as minimal as 2.5 mm can substantially complicate this dynamic and markedly increase ulnar loading – TFCC problems
- **Distal radioulnar joint involvement**
  - Increased pain, decreased grip, decreased rotation
- **Intra-articular involvement**
  - Step offs as little as 1-2 mm can increase posttraumatic arthritis

Therapy after Distal Radius Fractures

What do I need to know from the physician?

1. Type of fracture (Colles’, Smith’s, Barton’s, etc) and degree (intra-articular, comminuted, displaced)
2. Type of reduction (closed, external fixation, ORIF (plating))
3. Stability/Integrity of reduction, Bone quality
4. Additional structures involved (ulnar styloid, TFCC, ligament injury, etc)

What do I need to know from the physician?

5. Knowledge of the amount of radial shortening, dorsal angulation, the presence of any articular step-offs or any DRUJ issues (this is paramount)
What do I need to know from the patient?

- DOI/DOS
- PMH (Diabetes, OI, OA, etc) and general health (smoker, etc.)
- Type of work (musician, heavy laborer, secretary, etc.)
- Hobbies (golf, knitting, etc.)
- Patient's goals/expectations
- Family support/living situation (single, living alone)

Therapy Goal for functional vs normal wrist motion

- Normal is 140 flex/ext and 150 sup/pro
- Functional (varies depending on patient)
  - Palmer et al: 30 degrees ext., 5 degrees flexion, 10 degrees RD, 15 degrees UD
  - Ryu et al: 40 degrees ext., 40 degrees flexion, 40 degrees combined rd/UD
  - Gartland and Werley: 45 degrees ext., 30 degrees flexion, 15 degrees RD, 15 degrees UD and 50 degrees of each sup/pro

***Goals vary depending on the patient- ie. Elderly person vs. an athlete

Things to keep in mind with early intervention:

- Watch for CRPS/CTS and ill-fitting casts (should allow full MCP flexion and should not be too tight)
- Avoid slings if at all possible (=tight necks, tight shoulders)
- Wiggling is worthless (full composite digit ROM is necessary)
- Edema control (swelling is the mother of scar)

Treatment In A Cast or External Fixator??

- YES!!
  - Instruct patient in end range of motion exercises, making sure that the cast clears the DPC
  - Radial abduction and extension of the thumb (web spacer)
  - Pin care if in ext. fix.
  - Elevation/Edema Control
  - Can fabricate dynamic flexion to digits (over cast) if deficits are severe
  - Educate in elbow and shoulder ROM exercises

Treatment following ORIF

- Begin therapy within 3-5 days postop unless complication prohibits (poor bone quality, etc.)
- Fabricate wrist immobilization orthosis for proper position and comfort (to be worn between exc. and at night)

Benefits of ORIF

- Early motion
- Anatomical alignment
- Less pain
- Less time off, less therapy
- Patients are happier
Exploring Hand Therapy dba Treatment2go

**Treatment after casting or immobilization:**
- May need splinting between exercises and at night
- Begin wrist and forearm ROM exercises
- Add eventual strengthening exercises
- May require static progressive or dynamic splinting to regain ROM.
- Remember that functional activity is NOT a replacement for therapy – they need ROM to end range.

**Generalized Treatment**
- Applies to all types of surgical or nonsurgical interventions or fracture types.

**Dressings for Edema Control**
- Best method is elevation – Hand above the heart at all times
- Overhead pumping – regularly
- Avoid sling use – Does not properly elevate and promotes stiffness
- Distal to proximal massage – Also provides tactile input
- MEM
- Compressive wraps and gloves

**Essential Exercises**
- Patient involvement at home is essential (team effort)
- Never forget about the shoulder and elbow

**Additional Edema management Considerations**
- It has been said...
  - That the most important principle after distal radius fractures is to re-establish independent wrist extension
  - Avoiding the substitution pattern of using the digital extensors to perform wrist extension is critical
  - Perform isolated wrist ext. with the fingers wrapped down
**Composite Finger ROM - Do close up Demos**

- To Avoid EET (Extrinsic Extensor Tendon Tightness)
- To Avoid EFT (Extrinsic Flexor Tendon Tightness)

**Tendon Gliding Exercises**

- Isolated FDS
- Blocking - FDP

**Important exercises**

- Intrinsic Stretches
- Isolated FPL

- Composite fisting
- Lumbrical exercises

**Digital abduction and adduction**

- Isolated wrist extension
- Wrist flexion
Scar management

- Scar massage (done by therapist AND patient)
- Silicone gel sheeting
- Elastomer

Strengthening and ROM programs

- Range can’t be maintained unless the person has adequate strength in the muscles to maintain the available ROM
- Light strengthening should begin after cast, splint or fixator removal

Scar massage

Clinic Program

- Exercise regime in the clinic should be charted
- Watch to see when program needs to be changed
- Usually changed at least once a week (monitor ROM)
- Don’t get in a rut
The following are activities commonly used in the hand clinic:

- These samples are not comprehensive but will give you some guidelines to rehab. after distal radius fracture.

**Hand Exerciser**

**Putty**

**Pinch Strengthening**

**Dowel Exercises**

**Isolated wrist extension**

- Putty for wrist extension with fingers in flexion to avoid substitution.
Stretching and Weight Bearing

Wrist Curls for Extension & Flexion

Forearm strengthening

Clinic Activities

Can be done with a hammer at home (strengthening and stretching)

Flexbar Exercises for Pronation

Flexbar for Supination
Wrist Extension and Flexion

Powerweb

Screwdriver for supination and pronation

Large knob on work cube

Push/Pull

Work Simulation

Floor to Waist
Fine motor activities

UBE

- Cardiovascular exercise promotes healing by increasing bloodflow
- Promotes generalized feelings of well-being
- Remember patients can get depressed or feel hopeless at times

The Stiff Hand/Wrist

Why?

- **Reasons:**
  - Late referral to therapy
  - Noncompliant patient
  - Fear, “wiggling”
  - Tendon adherence
  - Joint tightness
  - Other health issues (diabetes)

Wigging is Worthless!

“Fracture Disease”

- Constellation of symptoms caused by prolonged immobilization
- Can lead to pain, unresolved edema, muscle atrophy, osteoporosis and CRPS
- “Late referral” patients often have well-developed substitution patterns that contribute to stiffness and dysfunction (i.e., using digital extensors to extend the wrist)

*Can be avoided or prevented with early digital motion and edema management*

Complication: The Stiff Hand/Wrist

- PROM/Joint Mobilization
- Heat and stretch
- US with a stretch
- CPM
- Serial static splint
- Dynamic/static progressive splints
  - Can be custom made or ordered via reps

Dynamic Splinting vs. Static-Progressive

- Dynamic splinting—“earlier” stiffness — proliferative stage of healing (soft-end feel)
- Static Progressive Splinting (low load, prolonged stretch)
  - More effective when PROM does not exceed AROM
  - Most effective with hard-end feel (worn longer)
  - Appropriate through acute, proliferative and chronic stages of healing

Dynamic composite flexion splinting (capsular tightness, EET)
Dynamic Flexion and Extension

A real dinosaur!

Static progressive devices

DeRoyal

Dynasplint for wrist Extension/Flexion

• Designed to reduce pain, reduce edema and improve range of motion
• Can be used at night to maintain gains made during the day
• Good when stiff in both directions and don’t want to use 2 splints

CPM (Continuous Passive Motion)

JAS for Supination/Pronation
Finger CPM

Treatment modalities for pain and edema associated with the stiff wrist
- Cold application
- Fluidotherapy (desensitization)
- Moist heat
- Ultrasound
- Interferential
- Compression gloves/sleeves

Complication: Ulnar-Sided Wrist Pain
- Lets look at the patient who is diagnosed with a distal radius fracture but keeps pointing to the ulnar side of the wrist and complaining
- What could be happening?
- Ulnar styloid fracture
- DRUJ instability
- TFCC tear
- Lunatotriquetral joint (carpal instability)
- Pisotriquetral degenerative joint disease
- Tendinitis – ECU or FCU
- Ulnar Nerve Compression

Ulnar head vs. Ulnar styloid
- Ulnar head is rounded prominence on ulnar side of wrist (easily palpated in pronation)
- Ulnar styloid is localized ulnar and slightly distal to ulnar head

Wrist Kinematics
- With a 20-degree dorsal tilt of the distal radius, the load across the ulnocarpal joint is increased to upward of 50%
- Radius shortening causes the most significant kinematic alteration and the greatest tension on the TFCC
- The most problematic deformity for the DRUJ is dorsal angulation
Ulnar variance

- When normal articular relationship between the radius and ulna is disrupted, loads through the ulnar structures exceed physiologic limits
- Ulnar variance = the distance that the distal articular portion of the ulnar head extends below (negative) or above (positive) the articular surface of the radius

Ulnar Variance

Positive ulnar variance

Ulnocarpal abutment syndrome

- Also known as impaction, loading, and impingement
- Sequence of events:
  - Wearing of the articular disc of TFCC
  - Chondromalacia of ulnar head and ulnar aspect of lunate
  - Disruption of LT ligament

Causes and symptoms of ulnocarpal abutment

**Causes:**
- Malunited radial shortening or angulation
- DRUJ ligament injuries

**Symptoms:**
- Pain localized to dorsal aspect of wrist over DRUJ or directly over TFCC region
- Intermittent clicking sensation, activity related swelling, decreased strength and motion

Treatment

- If radial articular alignment is satisfactory, ulnocarpal abutment can be corrected with ulnar shortening osteotomy
- If radial malalignment is significant, a corrective radial osteotomy is preferred
**Corrective Osteotomy**

**Before**

![Before image]

**After**

![After image]

**Complication: TFCC**

- Originates from sigmoid notch and inserts into the ulnar fovea and the base of the styloid
  - Includes dorsal and volar radioulnar ligaments, meniscus homologue, ulnocarpal ligaments, ECU tendon sheath, lunotriquetral interosseous ligament, and articular disc (TFC proper)

**TFCC**

- Stabilizes the DRUJ and separates it from the carpus and distal radius
- Primary ulnocarpal ligaments originate from TFCC, not the distal ulna
- The ulna absorbs 20% of axial loading forces (as in gripping) through its articulation with TFCC and ulnar carpus

**Central vs. Peripheral**

- **Central Portion** consists of chondroid fibrocartilage and bears compressive forces between ulnar head and triquetrum (smooth but mobile gliding surface) – devoid of vasculature
- **Peripheral** portion is ligamentous with thick collagen structure to bear tensile loads (palmar and dorsal limbs)
- Primary arterial supply is dorsal branch of anterior interosseous artery

**Incidence**

- Richards found 35% incidence of TFCC tears in intraarticular fractures and 53% in extraarticular fractures
- Patients with greater radial shortening and dorsal angulation were noted to be more likely to have TFCC tears.
Causes and Symptoms

- Injuries usually result from a rotational injury to the extended wrist
- Decreased strength and pain at the limits of rotation are most common complaints
- Pain primarily with rotation suggests DRUJ involvement. Pain with ulnar deviation suggests TFCC pathology or ulnar impaction.

TFCC testing

- Palpate between head of ulna and the triquetrum
- Fovea is a groove at base of ulnar styloid that serves as an attachment for TFCC (Fovea sign/Sulcus Sign) – may also be ulnar abutment

TFCC testing

- TFCC load test – to detect ulnar abutment or TFCC tears
- Ulnar deviation and axial loading of wrist moving volarly and dorsally or by rotating the forearm
- Positive with pain, clicking, crepitus, and reproduction of symptoms

TFCC Debridement (central tear)

- Volar wrist splint
- AROM 3-5 days postop
- No impact loading
- Light strengthening at 4-6 weeks
- Gradually resume ADL’s and wean from splint

Peripheral repair

- Week 1 Long arm cast
- Week 2-4 long arm splint Munster style to avoid sup/pro
- Week 4-6 short arm splint and begin forearm ROM
- Week 6-10
  - AROM
  - Avoid extremes of rotation
  - Continue use of splint except for bathing and exercise
  - Light ADL’s
  - Week 10 – begin gentle PROM
  - Light strengthening
- 12 weeks continue and upgrade strength program
  - Begin dynamic/static progressive splinting

Complication: Ulnar Styloid Fractures

- Occur in more than 50% of distal radius fractures, 25% go on to nonunion
- TFCC tears or DRUJ instability are suspect with radial displacement of the styloid or fractures at the base.
- May require splinting in a long arm orthosis
Complication: DRUJ Instability

- Prominence of distal ulnar head is a sign of DRUJ instability
  - Frykman showed that 19% of DRFX had problems with the DRUJ
  - Some say as many as 30% have at least some lasting complaints related to the DRUJ

DRUJ What is it?

- Distal Radioulnar joint (includes the TFCC)
  - Formed by sigmoid notch of radius and ulnar head
  - Rotates around a longitudinal axis that passes through the center of the radial head at the elbow to the fovea of the ulnar head at the level of the wrist
  - Promotes rotation and sliding movements between radius and ulna

DRUJ Testing

Piano Key Sign

- Sign – gentle downward pressure applied to distal end of ulna with forearm pronated. Head moves volarly but springs back when pressure is released
- Maneuver = “note” of pain
Piano Key Test
(DRUJ instability test)

- Distal ulna is grasped and moved passively in volar and dorsal direction at extremes of pronation and supination
- Done initially in neutral (up to 5mm may be noted)
- Pain, tenderness, and increased mobility relative to uninjured side

Complication: Distal Radius Malunion

- The incidence of distal radius malunion, or fracture healing in a non-anatomic position has been estimated to be 23%
- Symptomatic malunion may be less frequent
- The term “malunion” can be applied to any fracture with a dorsal tilt of 5° or greater, a radial inclination of 10° or less, or a loss of 5 mm or more of radial height.

Malunions result in many problems

- Often overlooked
- As many as 30% of distal radius fracture patients report complaints at the DRUJ
- Residual dorsal angulation is disruptive of DRUJ function
- Radial shortening relative to the ulna causes higher force transmission across the ulnar carpus, TFCC, and ulnar head which leads to TFCC degeneration and ulnocarpal abutment syndrome (painful and limited ulnar deviation and decreased grip strength)
Currently, there is no consensus about which one parameter is the most specific predictor of symptomatic malunion. Therefore, radial length, radial inclination, volar tilt, and articular congruity must all be evaluated with each distal radius fracture, and anatomic reduction must be attempted in an effort to restore each parameter to baseline.

Patients with step-offs will likely end up with DRUJ arthritis unless it is treated early enough. If DRUJ arthritis is NOT present but the patient has shortening and angulation the physician can perform a corrective osteotomy of the distal radius (try to recreate palmar tilt and radial inclination). If the radial articular alignment is alright then an ulnar shortening osteotomy can be used to shorten ulnar and decrease ulnar load (Rayhack). When arthritis is present the physician can perform salvage techniques such as a Darrach, Sauve-Kapandji, or a Bowers.

Salvage Procedures
- Darrach
- Sauve-Kapandji
- Bower’s hemi-resection
- One bone forearm
- Distal ulna arthroplasty
- Total wrist fusion
- Total wrist arthroplasty

Darrach
- Distal ulna resection
- Reserved for the elderly less active or rheumatoid patient
- Can have problems with the ulnar stump (instability)

Sauve-Kapandji
- Fusion of the DRUJ and creation of a pseudoarthrosis in the distal ulna proximal to the fusion
- Rotation then occurs at the pseudoarthrosis
- Ulnar support for the carpus is preserved, TFCC and ECU remain stabilized
- Problem with this is instability with the ulnar stump (more common when instability is present pre-op)
**Bowers**

- Hemiresection with interposition arthroplasty
- This is a popular technique involving resection only the articulating portion of the distal ulna and interposing soft tissue to prevent radio-ulnar impingement
- Does not correct ulnar plus deformity or DRUJ instability

**Salvage procedures continued**

- Distal ulna implant arthroplasty may be a promising option
- One bone forearm – will create one bone to provide stability and eliminate pain but sacrifices all rotation (rare)

**Scheker DRUJ Prosthesis**

**Pain relieving procedures**

- Total wrist fusion/wrist arthrodesis
  - Fusions are reliable and will facilitate stability and pain free motion
- Total wrist arthroplasties are used with extreme caution because the long term results of this procedure are not fantastic for young active patients

**Total Wrist Fusion**

**Failed External Fixation**
Total wrist fusion

Example:
Distal Radius Malunion
Quiz Time

1. Describe what you see? Is this intraarticular? How many parts? Inclination?

   Intraarticular, 3 part fracture with an articular step-off, loss of volar tilt

2. What has happened?

   FPL rupture

   Very unusual complication

3. What would you do?

   - Wrist ROM
     +25/40 (+50/65)

     Sup/Pro
     40/50 (65/70)
4. Problem Solving

- Your patient has the following digital ROM measurements:
  
<table>
<thead>
<tr>
<th>Active</th>
<th>Passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>0/50</td>
<td>0/70</td>
</tr>
<tr>
<td>0/80</td>
<td>0/60</td>
</tr>
<tr>
<td>0/55</td>
<td>0/40</td>
</tr>
</tbody>
</table>
  
  What is happening and what do you do?

5. What if……

- What if your patient’s digital ROM looked like this:
  
<table>
<thead>
<tr>
<th>Active</th>
<th>Passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/80</td>
<td>0/80</td>
</tr>
<tr>
<td>15/100</td>
<td>0/100</td>
</tr>
<tr>
<td>0/75</td>
<td>30/75</td>
</tr>
</tbody>
</table>

- EET (Extrinsic Extensor Tendon Tightness)
  
  - Dynamic composite flexion splinting
  - Digital taping with heat
  - Full composite PROM

- EFT (Extrinsic Flexor Tendon Tightness)
  
  - Dynamics with or without the wrist depending on location
  - Full digital passive extension is the key
6. What is being assessed in this position

Intrinsic Tightness

- This is an Intrinsic Stretch
- One call also use a P1 block splint with or without dynamics
- Also try Digital taping with heat

P1 Block Splint

- FPL adhesions are not uncommon (origin off the radius and moved during surgery)
- Include in P1 Block and vary position to increase excursion

7. “Stuck in the Muck”

- Patient presents with normal passive flexion of the digits but unable to make a fist actively (following ORIF) – what do you do?

- P1 Block splint (puts tendons at a mechanical advantage)
- E-stim to increase muscle contraction
- Early gentle resistive gripping (nerf ball)
- Sustained gripping activities
- Address scar adhesions
Dig Deep

- Ask questions
- Compare to the unaffected side if possible
- Don’t assume anything

Everyone is different

- Truly caring for your patient and treating the “whole” person is the difference between being good and being great

Our role

- References to therapy in the literature concerning distal radius fractures vary.
  - Some make no mention of therapy
  - Other sources indicate that the need for therapy may be a poor prognostic sign and recommend therapy only when finger and wrist stiffness persist.
  - Few studies document the effectiveness of therapy and the effect on functional outcomes

What can we do?

- Know your stuff – educate yourself and communicate well
- Document outcomes
- Publish results
- Set up lectures/informational meetings to educate physicians, case managers, etc. on what we do with patients
- Represent your profession

Show the Way!

Take Risks!
(even if you might be the next distal radius fracture)

- Ask questions, seek answers, and always keep learning!
- Look at things from a different perspective
  - Take a different path
• Thank You!!!!!!