MRI of the Post-operative Elbow, Wrist and Hand

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Steps to Success

• Artifact-limiting protocol / monitoring
• Determine type of procedure
• Know basic surgical principles
• Review MR images
  – Ask: was "correct" surgery done?
  – Ask: has surgical repair broken down?
  – Ask: does the patient have new pathology?

Protocol Issues

• Remove fat suppression
• Avoid gradient echo sequences
  – *Exception:* to 'find surgery'
• Add contrast
• STIR vs T2 FSE
• FSE instead of SE for T2
• Increase bandwidth
  – *Limitation:* increases motion artifact
• Lower TE
• Swap phase / frequency
Remove fat suppression
...only if necessary!

T1 MR arthrogram

Remove fatsat

Find the Surgery!

T2 Acromioplasty

T2 GRE Tendon-to-tendon repair

POST-OP ELBOW

- Tendon, ligament repair
- Cubital tunnel release
**Ulnar Neuritis: Pre-op**

- Retinacular thickening
- Perineural edema

**Post-op: Cubital Tunnel Release**

*Ulnar Nerve Transposition*

- Ulnar nerve placed anterior to epicondyle

**“Tommy John” Surgery**

*Ulnar Collateral Ligament Reconstruction*

- Ligament becomes repeatedly injured, stretched over time, thickened and insufficient “dead arm”; predisposed to tear
- Tendon removed from wrist or hamstring, grafted in figure eight pattern from humerus to ulna
- Analogous to ACL reconstruction
- Appears thick normally after surgery
- Success rate 85% with major league pitchers
- Most improve compared to pre-op performance
Tommy John Surgery
Ulnar Collateral Ligament Reconstruction

Professional Baseball Pitcher...had best season after surgery

Common Extensor Tendon Repair: Intact

Tendon Repair: Partial Thickness Retear
Complete Re-tear
Common Extensor Origin

POST-OP WRIST

- Tendon, ligament surgery
- Carpal tunnel / Guyon’s canal release
- Fracture fixation
- Ulnar variance surgery
- Silastic

DeQuervain’s Release

Surrounding scar - may cause adhesion
TFCC Peripheral Debridement

Tell-tale surgical artifact

- Peripheral fraying
- Central thinning

TFCC Central Debridement
Suturing of Scapholunate Ligament

Post-op Ulnar Shortening

Carpal Tunnel Release
Carpal Tunnel Release

- Superficialization of median nerve
- Often remains thick, edematous

Post-op Carpal Tunnel Release

Recurrent Symptoms

- Distal – small
- Scarring, regrowth of retinaculum

Proximal – enlarged, edematous, fascicular

Carpal Tunnel Release

Prominent Scar Tissue
Guyon’s Canal Release

Fracture Fixation

Scaphoid Nonunion
Pre and Post Fixation
Scaphoid Fracture
Post-op Fixation with Pseudarthrosis

Silastic Implant
Implant low signal – all sequences
Not done much anymore
Silastic synovitis: bone lysis
Look for erosion, fluid, enhancement

Summary

- Monitor cases – minimize artifact
- Determine type of procedure performed: GRE is your friend
- Apply rules of thumb
Thank You!