1 Comprehensive Orthopaedic Review
   Hand and Wrist Tendinopathies
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2 de Quervain Disorder
   • Fritz de Quervain, Swiss surgeon, 1895
   • Stenosing tendinosis, 1st dorsal compartment
   • Attritional, degenerative tendon changes and retinacular thickening
   • Finkelstein test, physical exam maneuver, 1930
   • Eichhoff test is another provocative maneuver
   • Affects women 6 times more often than men
   • Middle age, dominant side, repetitive lifting

3 Injection is effective treatment for de Quervain disease
   • Accuracy of injection is important
   • Post-injection casting improves outcome

4 de Quervain Tendinopathy: Survivorship and Prognostic Indicators of Recurrence Following A Single Corticosteroid Injection
   Earp et al., JHS 2015; 40A: 1161–65
   • 50 patients (mean 49 years), 50 wrists
   • 82% were symptom-free at 6 weeks after injection
   • 24 patients had recurrence, all within 6 months of injection
   • Past trigger digit predicted need for surgery
   • Prognostic Level IV study (Boston, MA)

5 Thumb Interphalangeal Joint Extension by the EPB: Association With Subcompartment & de Quervain’s Disease
   Alemohammad et al., JHS 2009; 34A: 719–23
   • 90 cadaver wrists, 143 patients w/de Quervain’s disease
   • EPB separate subcompartment found in 20% cadavers, but 71% patients
   • EPB could extend thumb IPJ (through distal phalanx or extensor hood insertion) in 21% cadavers, but 39% patients
   • When EPB can extend thumb IPJ, it usually resides in a separate subcompartment

6 Limited Surgical Treatment of de Quervain’s Disease:
   Decompression of Only the EPB Subcompartment
   Yuasa et al., JHS 1998; 23A: 840–43
   • 22 patients w/de Quervain’s disease had release EPB only
   • 16 of 22 (73%) had EPB in a separate subcompartment
   • All patients had symptomatic relief
   • de Quervain’s disease is EPB entrapment and it is sufficient to release the EPB only
   • Therapeutic Level IV (Japan)

7 Extensor Triggering in de Quervain’s Stenosing Tenosynovitis
   Alberton et al., JHS 1999; 24A: 1311–14
   • Retrospective review 827 patients w/de Quervain’s disease over 5 years, 11 patients (13 wrists) had triggering (1.3% prevalence)
   • 7 of 12 (58%) wrists failed nonoperative treatment
   • All wrists had tenosynovitis, separate EPB subcompartment, no tendon nodules
Triggering or locking in extension predicts recalcitrant course if treated nonoperatively

8 Intersection Syndrome
- APL, EPB muscle bellies cross ECRL, ECRB
- “Cross-over tendinitis” or “APL bursitis”
- “Intersection syndrome” coined by Dobyns
- Tendinosis of 2nd dorsal compartment
- Repetitive wrist motion (rowing, weight-lifting)
- Majority improve with 2nd dorsal compartment injection
- Injection failures require 2nd dorsal compartment release

9 ECU Synergy Test
- Clinical test for diagnosis of ECU tendinosis
- ECU contracts on resisted thumb abduction with wrist in neutral, forearm supinated
- Distinguishes ECU tendinosis from intra-articular process such as TFC tear

10 Morphometric Analysis of Lister’s Tubercle and Its Consequences on Volar Plate Fixation of Distal Radius Fractures
Clement et al., JHS 2008; 33A: 1716–19
- 100 cadavers were dissected to define anatomy of Lister’s tubercle, EPL groove
- Height of Lister’s varied 2–6 mm
- Depth of EPL groove varied 1–5 mm
- Height difference ranged 4–10 mm
- Difficult to determine past pointing of distal screws when volar plating DRFx
- Cadaver study (Austria)

11 Volar Locking Plate (VLP) position on distal radius is crucial to avoid flexor tendon compromise
- Plates positioned within 2 mm of the volar critical line (VCL) or within 3 mm of the volar rim of distal radius increase the probability of flexor tendon rupture
- Remove prominent plates after 6 months, especially if flexors are symptomatic

12 Linburg–Comstock Syndrome
- Young patients with vague forearm pain
- Anomalous FPL tendinous slip to index FDP
- Present in 31% extremities, 14% bilateral
- Onset – spontaneous, trauma, repetitive use
- Provocative test – Restricting index DIPJ flexion during thumb IPJ flexion
- Resection of anomalous FPL slip is curative

13 Intrinsic muscles of the fingers: function, dysfunction and surgical reconstruction
Richard J. Smith (Harvard)
- Transverse fibers (intrinsic apparatus) are distal to sagittal bands and flex the MCPJs
- Oblique fibers (intrinsic apparatus) are distal to the transverse fibers and assist the central slip in extension of middle phalanx
- Medial tendon of dorsal intersosseous inserts at lateral tubercle of proximal phalanx and is finger abductor
- Sagittal bands (extrinsic system) lift proximal phalanx into extension through volar plate and proximal phalanx
Transverse retinacular ligaments prevent lateral bands from dislocating dorsally at PIPJ

14 Sagittal Band Rupture
- Sagittal bands centralize EDC over the metacarpal head
- Sagittal bands function to extend the proximal phalanx
- Attenuation or rupture of sagittal bands may occur
- Most often radial sagittal band, traumatic, middle finger
- Cause may be trivial such as flicking finger
- Painful EDC snapping w/MCPJ flexion, weak extension, ulnar deviation of affected digit

15 Rayan–Murray Classification
- Type 1 – Mild – No EDC subluxation
- Type 2 – Moderate – EDC subluxation
- Type 3 – Severe – EDC dislocation

16 Non–Operative Treatment Acute Sagittal Band Rupture
- Acute (within 2 weeks) flexion–block splint
- Can use slip of the EDC to stabilize

17 Elson Test
- Must have high index of suspicion for central slip rupture in any PIPJ injury
- Mechanism of injury is forced PIPJ flexion on the extended finger
- If central slip and triangular ligament are ruptured, then the lateral bands will sublux volarly
- With the PIPJ held in flexion, there is increased tone in lateral bands, resulting in DIPJ extension

18 FCR Tendinosis
- Rare entity – 1994 Mayo report of ten cases
- Average age 44 years of age, symptomatic an average of 16 months
- Causes include strenuous work, scaphoid fracture or cyst, TMCJ or STT or pantrapezial arthrosis
- Radial–sided wrist pain aggravated by volar flexion and radial deviation
- Diagnosis confirmed by lidocaine injection into FCR sheath

19 FCR Anatomy
- Narrow fibro-osseous tunnel
- Inserts on index and middle metacarpal bases and trapezial crest
- Close proximity to carpal canal, superficial arch and PCB median nerve

20 Treatment of FCR Tendinosis
- Release of FCR sheath, debridement
- 4/10 patients had attritional FCR wear
- Results were 5/10 residual pain, 7/10 tenderness, one had + Tinel's over PCB median nerve
- Risk–reward analysis is not favorable
- If FCU intact, then simple FCR tenotomy is suggested, since FCR is expendable (often used as autograft)

21 Trigger Finger: Prognostic Indicators of Recurrence After Injection
Rozental et al., JBJS 2008; 90A: 1665–72
- 124 trigger digits injected w/triamcinolone
56% recurrence rate one year post-injection
- Young age, IDDM, multiple digits, other tendinopathies – predictive of recurrence
- Duration, severity symptoms – not predictive
- Prognostic Level I study (Harvard Univ)

22 Effect of Corticosteroid Injection for Trigger Finger on Blood Glucose Level in Diabetic Patients
Wang et al., JHS 2006; 31A: 979–81
- 18 diabetic patients received methylprednisolone injection for single trigger digit
- Blood glucose measured for 5 days post-injection
- Mean increase in blood glucose was 73% on day 1, 26% on day 5
- 7 of 16 patients required surgery 1 year later
- Steroid injection in diabetics causes hyperglycemia

23 Corticosteroid Injection in Diabetic Patients with Trigger Finger
Baumgarten et al., JBJS 2007; 89A: 2604–11
- Prospective, randomized, controlled, blinded
- 30 diabetic patients, 29 non-diabetic patients
- In diabetics, injection did not relieve symptoms or decrease surgery rate vs placebo
- Diabetics w/systemic pathology needed surgery
- Therapeutic Level I study (Washington Univ)

24 Trigger digit with flexion contracture of PIPJ
- Quinnell Grade 4 trigger digit lesion
- Attritional wear of FDS
- Sheath stenosis at both A1 & A2 pulleys
- Proper treatment is to resect ulnar slip FDS or entire FDS
- Remove at A3 window

25 Calcific Peritendinitis
- Any tendon, but often FCU
- Acute pain, swelling near tendon
- Rapid onset, like infection
- Calcium deposition near the tendon, not intratendinous
- Treat with immobilization, NSAIDs, injection

26 Flexor Pulley System: Anatomy, Injury and Treatment
Zafonte et al., JHS 2014; 39A: 2525–32
- Thumb flexor sheath – some patients may have Av pulley distal to A1
- Finger flexor sheath – may vent A2 and/or A4
- 30–50% rock climbers will injure flexor pulley in the crimp position (PIPJ flexed, DIPJ extended)
- Grade IV injuries (multiple pulley ruptures) should be reconstructed with circumferential free tendon graft
- Avoid multiple flexor tendon sheath injections

27 Post-Injection Flare Reaction
- Increase in pain, inflammation within hours of injection
- Occurs in 25% of patients injected
- All patients should be advised of this possibility at time of injection
- Inflammation due to steroid ester crystals
- Symptoms resolve in 48 hours
• NSAIDs and ice are recommended

Injection Complications
• Post–injection flare reaction
• Subcutaneous atrophy
• Skin hypopigmentation
• Tendon or pulley rupture
• Hyperglycemia in diabetics
• Articular cartilage damage