Clearing the Muddy Waters: Managing Injuries in the Workplace

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Elbow Tendinopathies: Epicondylitis and the Distal Biceps

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Lateral Epicondylitis

- What is it?
- How and why does it occur?
- How does it present?
  - Historical features
  - Common exam findings
  - Differential diagnosis
- Treatment options

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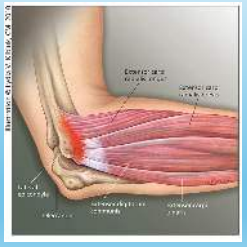
What is Tennis Elbow



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Lateral Epicondylitis

- Degenerative not inflammatory (poorly named. Not an –itis)
- Poorly understood etiology
- Rarely related to tennis or a specific activity
- Typically self limited but can take frustratingly long to resolve
- No clear consensus on best approach and not clear that any intervention is better than time(observation)
- Hurt vs Harm

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Pathophysiology

- "Angiofibroblastic hyperplasia" at the insertion of the extensor carpi radialis brevis (ECRB); described by Nirschl and Pettrone in 1979
- Tendon material is invaded with fibroblasts and vascular granulation-like tissue (gray and edematous)
- Origin of ECRB at lateral epicondyle becomes chronically degenerative and painful.

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Anatomy

- Extensor muscles originating from the lateral epicondyle include:
  - Extensor digitorum communis (EDC)
  - Extensor carpi radialis longus (ECRL)
  - Extensor carpi radialis brevis (ECRB)
  - Extensor digiti quinti (EDQ)
  - Extensor carpi ulnaris (ECU)
  - Part of the supinator

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Epidemiology

- Affects ~1–3% of adults annually
- Most common age 30–60
- No strong sex predilection
- No clear relationship to occupation or activity

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History

- Often no history of specific traumatic event
- I rarely see tennis in racquet sports players
- Occupational injury?
- MOST COMMON CAUSE: not clear....
- Rite of passage into middle age

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History

- Patients complain of gradual onset on lateral elbow pain radiating to the forearm
- They often also note proximal and mid-forearm pain, or "aching" discomfort
- Frequently pain is quite marked at night time and patients may complain of elbow stiffness upon awakening
- Patients report pain with many daily activities
- Typically no motor or sensory symptoms although distally radiating elbow / forearm pain can make patients complain of weakness

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Natural History

- Favorable, self-limited condition
- Most resolve in 6–12 months
- Up to 1–2 years in some cases
- Continued arm use does NOT cause harm/injury
  - continued use not known to prolong the course

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Physical Examination

- Point tenderness at the lateral epicondylar prominence; can be tender slightly distal and anterior to lateral epicondyle
- Pain will be worsened by passive wrist and finger flexion while the elbow is held extended
- Resisted wrist extension with the elbow extended will also exacerbate pain
- Loss of elbow extension may be seen in rare cases

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Point tenderness at the lateral epicondylar prominence

Courtesy of Leon S. Benson, MD

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Passive wrist and finger flexion with the elbow extended will worsen pain at lateral epicondyle

Courtesy of Leon S. Benson, MD

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Exam Tests

Grasp and lift test.

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Imaging

- Rarely needed/helpful
- MRI – not needed except in unusual cases
  - always shows increased signal at the ECRB origin of the lateral epicondyle
  - reasonable if considering instability or alternative diagnoses

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Treatment

- Most patients do not need surgical care
- Education and reassurance in most cases
- Physical therapy
  - Eccentric strengthening
  - A few visits and then home exercise program
  - Don't undermine resilence
- Injections
  Steroid, PRP, Autologous blood→no proven benefit
  - I use rarely (short term pain relief)
- No clear benefit for all other modalities(shock wave, etc)

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Injection Therapies: Evidence Comparison

Injection	Short-Term Relief	Long-Term Outcomes	Risks	Evidence	Bottom Line
Corticosteroid	Strong	Worse at 6–12 mo	Atrophy, depigmentation	High	Avoid routine use
PRP	Modest	Mixed	Cost, variability	Moderate	Refractory cases
Dextrose prolotherapy	Best	Best mid-term	Soreness	Moderate–High	Most promising
Botulinum toxin A	Yes	Limited	Weakness	Low–Moderate	Selective use
Autologous blood	Variable	No superiority	Pain flare	Low	Insufficient evidence
Iontophoresis	Mild	Limited	Minimal	Moderate	Adjunct only

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Treatment

- Empathy
- Education
- Discuss pain vs nociception
- Discuss hurt vs harm
- Pain is a protective mechanism
  - Sometimes it is a false alarm
  - No "injury"

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Surgical Indications

- Rarely required
- Consider after ≥9–12 months conservative care
- Only when diagnosis is certain and refractory

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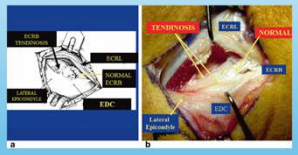
Surgical Procedure

- Nirschl Procedure
  - Debridement and excision ECRB origin
    - Tissue gray and friable
  - Rule out injury of LUCL
  - Rarely need to reconstruct LUCL



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Key Clinical Pearls

- Tennis elbow is self-limited
- Education is therapeutic
- Exercise > injections long-term
- Steroids offer short-term relief but long-term harm
- Surgery should be rare

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Differential Diagnosis

- Radial tunnel syndrome
- Cervical radiculopathy
- Posterior interosseous nerve syndrome
- Elbow arthritis
- Posterolateral rotatory instability of the elbow

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Distal Biceps Tendon Ruptures

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Another perspective

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Epidemiology

- Incidence ~1–2.5 per 100,000
- Predominantly middle-aged men
- Dominant arm most often affected
- Risk factors: smoking, steroids, eccentric loading

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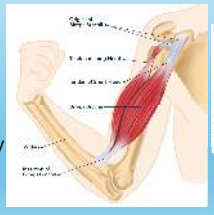
Anatomy

- Elbow flexion
- Supination
  - More important
- Inserts on the radial tuberosity
  - Both long and short heads



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Mechanism of Injury

- Sudden eccentric load
- Flexed elbow with supinated forearm
- Heavy lifting or weight training

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Clinical Presentation

- Sudden pain with audible pop
- Swelling and ecchymosis
- Weakness in supination and flexion
- Reverse Popeye deformity

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Exam Findings

- Deformity
  - Not always if lacertus fibrosis intact
- Supination pain/weakness
- Hook test
- Abnormal biceps excursion
- Often bruising/ecchymosis

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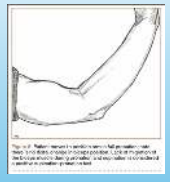
Additional tests



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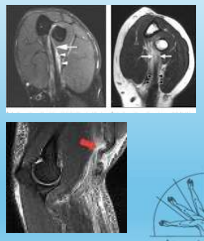
Imaging

- • X-ray: rule out fracture
- Ultrasound: dynamic, cost-effective
- MRI: gold standard for tear characterization



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Treatment Overview

- Non-operative management
  - Should be discussed and considered
  - Shared medical decision making
  - Accept some loss of supination power and endurance
  - Vet, my brother in law, and me……
- Surgical repair or reconstruction
  - One incison
  - Two incision
- Excellent outcomes with near normal return of supination and flexion power
- Decision individualized to patient goals

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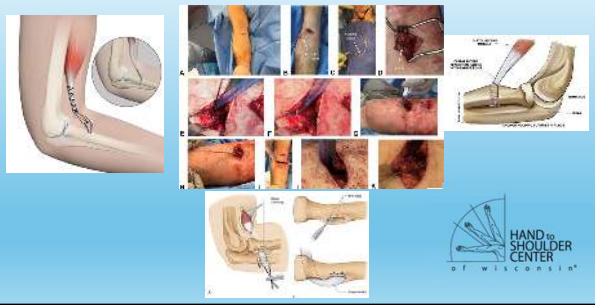
Surgical Repair Techniques



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Surgical Outcomes

- Superior restoration of supination and flexion strength
- Improved patient-reported outcomes
- Best results with early repair (<3–4 weeks)

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Operative vs Non-operative Outcomes

- Operative Management:
- • Greater supination and flexion strength
- • Better DASH and MEPS scores
- • Higher satisfaction in active patients
- Non-operative Management:
- • Lower complication rates
- • Persistent strength deficits
- • Reasonable for low-demand patients or those willing to accept some loss of supination power
- Systematic reviews and meta-analyses consistently favor surgery for STRENGTH outcomes
  - More strength does not always equate to improved function

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Complications

Surgical:

- Lateral antebrachial cutaneous nerve injury
- PIN nerve injury
- Heterotopic ossification
- Stiffness

- Non-operative:
  - Permanent strength loss(mostly supination)
  - Possible deformity/cosmetic

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Rehabilitation

- Early protected motion post-operatively
- Gradual strengthening
- Return to unrestricted activity ~4–6 months

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Key Takeaways

- • Distal biceps ruptures does not always significantly impair function
- • Surgery provides superior strength restoration
- • Non-operative care appropriate for selected patients
- • Shared decision making is essential

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Key References

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