

# Medial and Lateral Epicondylitis What do we do?

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# Epicondylitis

- Misnomer
- Not a disorder of the epicondyle (epicondylitis)
- Not an inflammatory condition (epicondylitis)
  
- Tendinosis
- Tendinopathy
- Epicondylalgia
- Enthesopathy
- Epicondylosis

# What do we do?



# Elbow Tendinosis

## Lateral Elbow Tendinosis

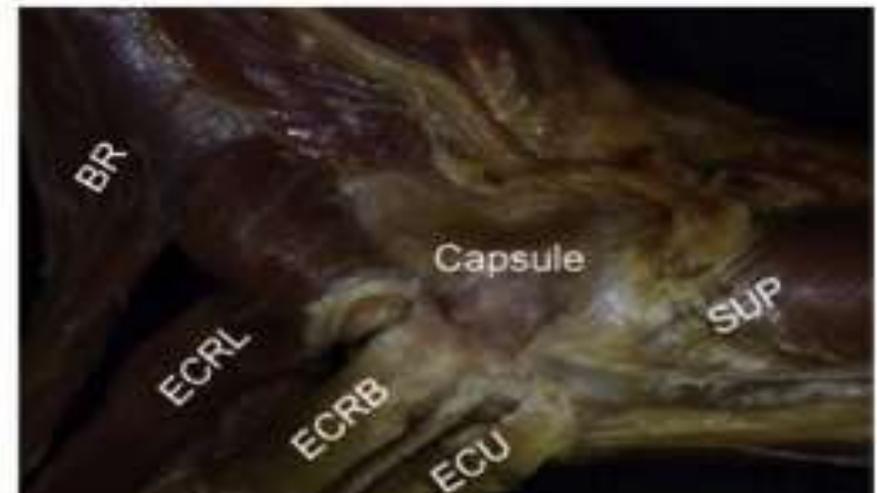
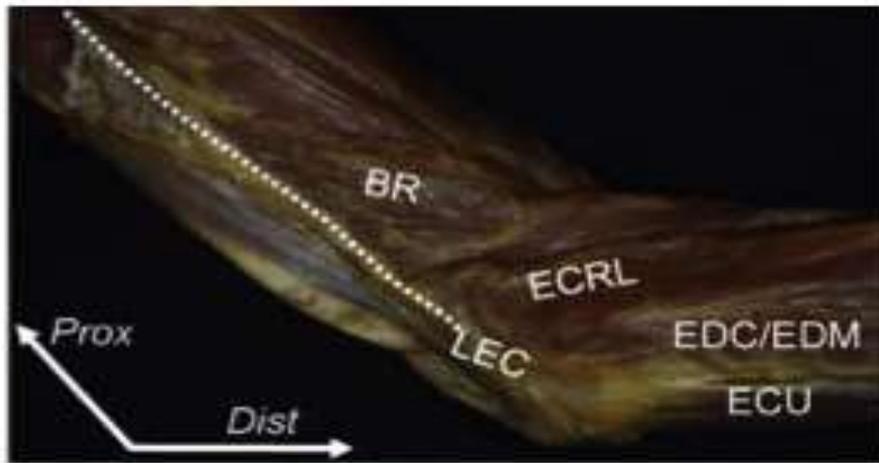
### **Tennis Elbow**

- Most common overuse disorder of the elbow
- Primary structure: ECRB
- Anterior edge of EDC involved in 50%
- ECRL and rarely ECU involvement



# Joint Capsule Attachment to the Extensor Carpi Radialis Brevis Origin: An Anatomical Study With Possible Implications Regarding the Etiology of Lateral Epicondylitis

Akimoto Nimura, MD, Hitomi Fujishiro, MSc, Yoshiaki Wakabayashi, MD, Junya Imatani, MD, Hiroyuki Sugaya, MD, Keiichi Akita, MD



# Elbow Tendinosis

## Medial Elbow Tendinosis

### **Golfer's Elbow**

- Primary structures: FCR and PT
- FCU involved in 5%
- Cubital tunnel syndrome seen in 30% of cases



# Elbow Tendinosis

## Country Club Elbow

Combination of lateral and medial tendinosis



# Elbow Tendinosis

## Posterior tennis elbow

- Tendinosis of the triceps at its insertion
- Uncommon
- Seen in throwers, forceful elbow extension
  - Baseball, javelin
- Associated with olecranon compartment abnormalities
  - Synovitis
  - Loose bodies

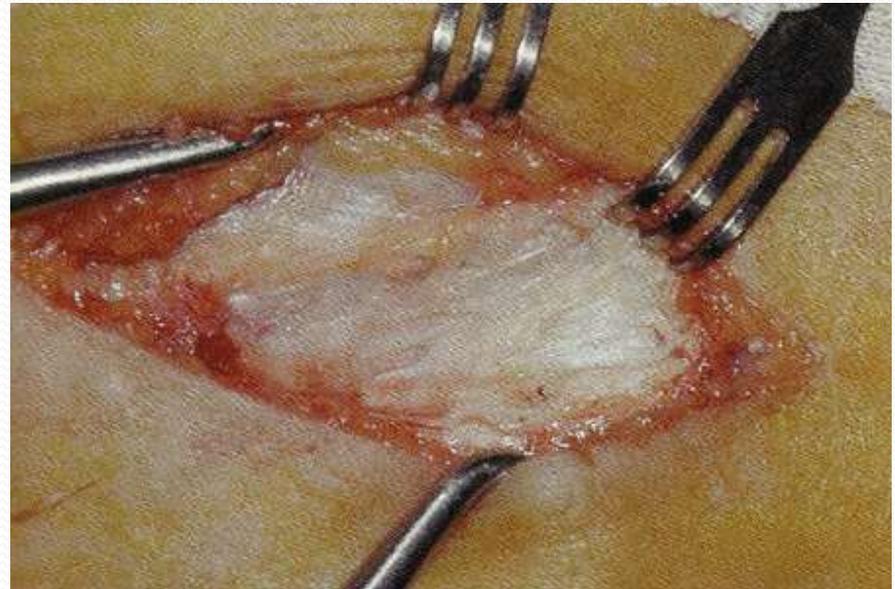


# Elbow Tendinosis

- Differential diagnosis
  - May be found in combination or as separate entities
  - Cubital tunnel syndrome
  - Carpal tunnel syndrome
  - Radial nerve entrapment
  - RTC tendinosis
  - Cervical arthrosis/nerve root compression
  - Intraarticular abnormalities
    - Loose bodies, osteoarthritis, synovitis
  - Joint laxity
    - Especially the MCL in throwing athletes

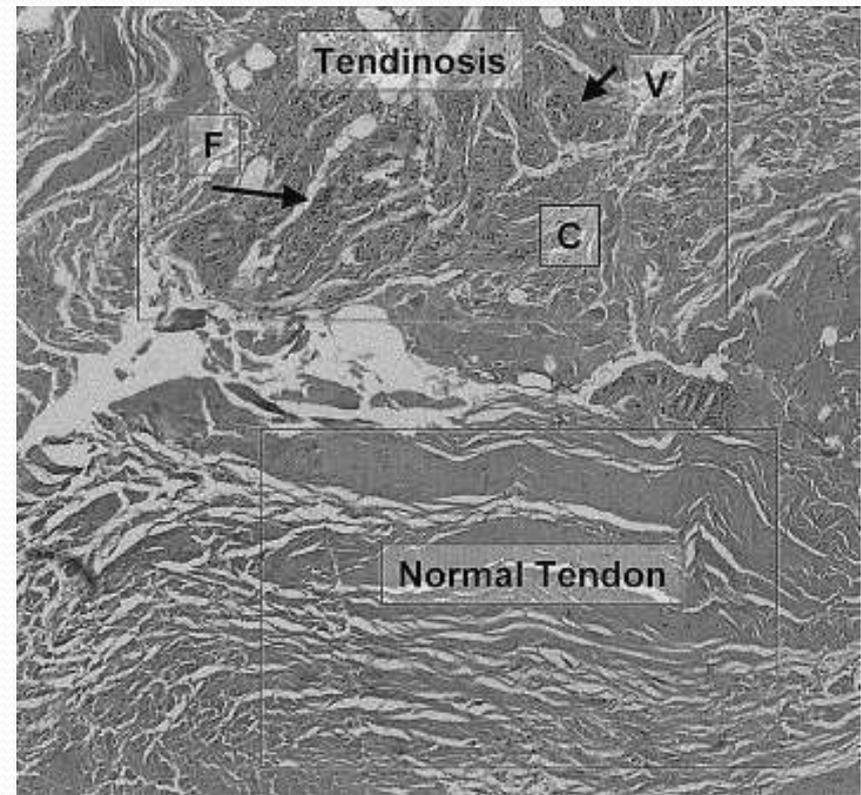
# Elbow Tendinosis

- Pathology
  - Gross abnormalities
    - Gray, homogenous, edematous, friable tissue
      - Distinct from normal tissue
    - Seen in lateral, medial and posterior tendinosis
    - 97% of ECRB in lateral epicondylitis



# Elbow Tendinosis

- Pathology
  - Microscopic
    - Disruption of normally ordered tendon fibers by invasion of fibroblasts and vascular granulation tissue
      - Angiofibroblastic hyperplasia
      - Tendon microtears
    - Hyaline degeneration
    - **No evidence (absence) of acute or chronic inflammation**
    - Injection site: nonpolarizable amorphous eosinophilic material



# Elbow Tendinosis

- Why does it hurt?
  - We don't know
  - Absence of inflammatory cells
  - Presence of noxious chemical mediators
  - Ingrowth of free nerve endings
    - Immunohistochemical markers for nerve endings found
    - Nerve not seen on electron microscopy



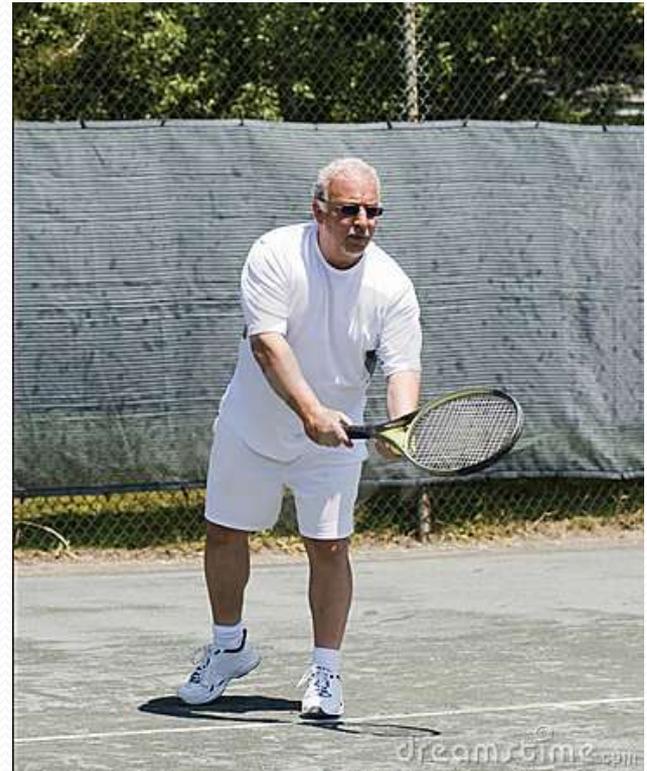
# Lateral Elbow Tendinosis

- Incidence
  - Lateral epicondylitis affects ~2-4 percent of general population
  - 40% population will experience some symptoms of LET
  - 75% affect dominant arm
    - 50% of tennis players over age 30
      - 50% minor symptoms <6 mos
      - 50% major symptoms, 2.5 years



# Lateral Elbow Tendinosis

- Epidemiology
  - Onset 35-50 years
    - Mean 41 years
  - Male=female
  - Self-limited disease often
- Etiology
  - Repetitive overuse
    - Tennis player who plays at least 3-4 times per week
  - Direct blow to over of the epicondylar areas
  - Sudden extreme effort



# Lateral Elbow Tendinosis

- Epidemiology
  - Seen in other activities with repetitive motions
    - Computer use, baseball, fencing, swimming, carpentry, plumbing, politicians (frequent hand shaking)



# Treatment



# Lateral Elbow Tendinosis

- Nonsurgical management
  - Pain control program
    - Aspirin, NSAIDS
    - Cold therapy
    - High-voltage electrical stimulation  
4-6 sessions over 2-3 weeks
    - Nitric oxide patches
    - Ultrasound
    - Heat and massage
    - Iontophoresis
    - Phonophoresis
    - Laser therapy
    - Mirror therapy
    - Dry needling
    - Accupuncture
    - Manual therapy/eccentric exercise



# Lateral Elbow Tendinosis

- Nonsurgical management
  - Relative rest
    - Absence of abuse not activity
    - Alteration of technique
    - Alteration of equipment (racket handle size)
  - Counter force bracing
    - Supplements tendon origin
    - Constrains full muscular expansion, decreasing muscle force
  - Partial immobilization with wrist extension splints



# Lateral Elbow Tendinosis

- Nonsurgical management

Rehab exercise program

Not only forearm exercises  
but also back and shoulder

Multiple exercise  
programs

Eccentric contraction

Anconeus  
strengthening/ulnohumer  
al tracking



# Lateral Elbow Tendinosis

- Nonsurgical management
  - Injection
    - Kenalog and lidocaine
    - Injected under ECRB just anterior and distal to lateral epicondyle
    - No more than 3 injections total
    - Helpful in short-term, may not help in long term



## A Randomized Study Comparing Corticosteroid Injection to Corticosteroid Iontophoresis for Lateral Epicondylitis

Amalia Stefanou, MD, Nathan Marshall, BS, Wendy Holdan, BS, Aamir Siddiqui, MD JHS 2012

- Randomized 82 patients
- 10 mg dexamethasone via iontophoresis (24 hr battery)
- 10 mg dexamethasone injection
- 10 mg triamcinolone injection
  
- Iontophoresis group statistically improvement in grip strength
- Iontophoresis group more likely to return to work without restrictions

# Effect of Corticosteroid Injection, Physiotherapy, or Both on Clinical Outcomes in Patients With Unilateral Lateral Epicondylalgia

A Randomized Controlled Trial

- 165 pt. randomized into 4 groups
  - Steroid injection
  - Placebo injection
  - Steroid injection plus physiotherapy
  - Placebo injection plus physiotherapy
- Outcomes
  - 1-year global rating of change scores for complete recovery (6 point scale ranging from “complete recovery” to “much worse”)
  - 1-year recurrence rate (complete recovery or substantial improvement at 4-8 weeks, but not later)

# Effect of Corticosteroid Injection, Physiotherapy, or Both on Clinical Outcomes in Patients With Unilateral Lateral Epicondylalgia

A Randomized Controlled Trial

- Results
  - Steroid vs placebo injection
    - Steroid had lower complete recovery/substantial improvement (83% vs 96%) and higher recurrence rate (54% vs 12%)
  - Physiotherapy
    - No difference

## Comparison of Autologous Blood, Corticosteroid, and Saline Injection in the Treatment of Lateral Epicondylitis: A Prospective, Randomized, Controlled Multicenter Study

Jennifer Moriatis Wolf, MD, Kagan Ozer, MD, Frank Scott, MD, Michael JV Gordon, MD, Allison Williams, JHS 2011

- Prospective, randomized, controlled trial
- 3ml saline and lidocaine
- 3ml autologous blood and lidocaine
- 3ml corticosteroid and lidocaine
- Outcome measure – DASH scores
- Pain VAS pre-injection, at 2 weeks, 2 months, and 6 months
- **No significant difference at 2 and 6 months for all 3 groups**

# Lateral Elbow Tendinosis

- Surgical options
  - Open release/debridement
  - Arthroscopic release/debridement
  - Percutaneous release



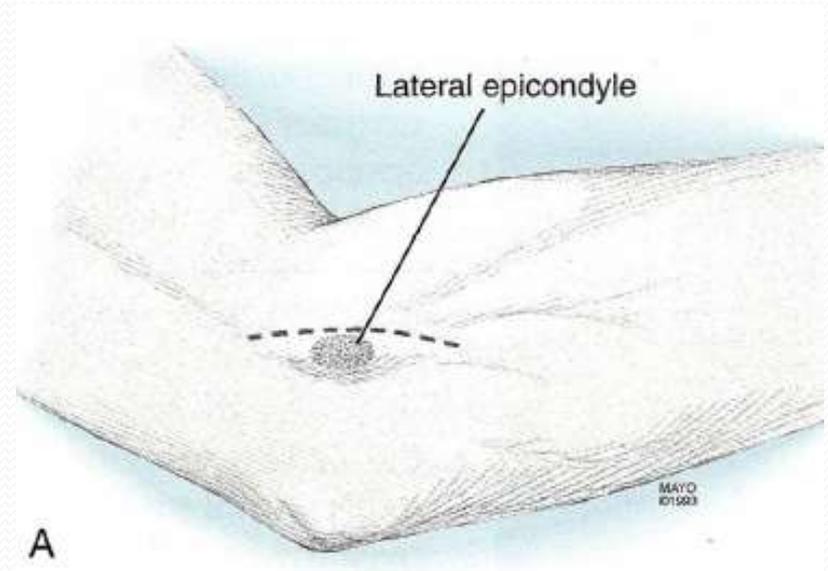
# Lateral Elbow Tendinosis

- Indications for surgery
  - Failure of conservative treatment including activity modification, therapy, injection with symptoms >1 year
  - Calcific tendonitis
  - Bony exostosis
  - Constant pain without activity
    - Indicates more advanced pathology
  - Pts unable or unwilling to modify activity level



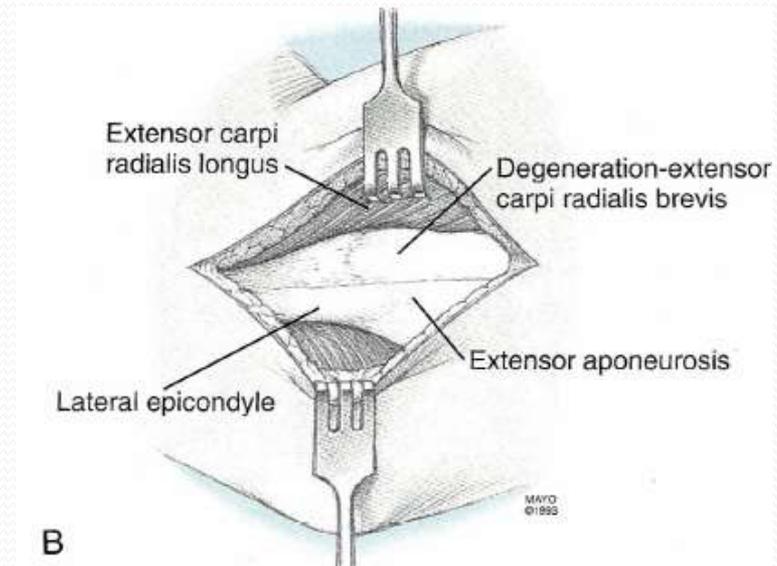
# Lateral Elbow Tendinosis

- Open release
  - Skin incision over the lateral epicondyle



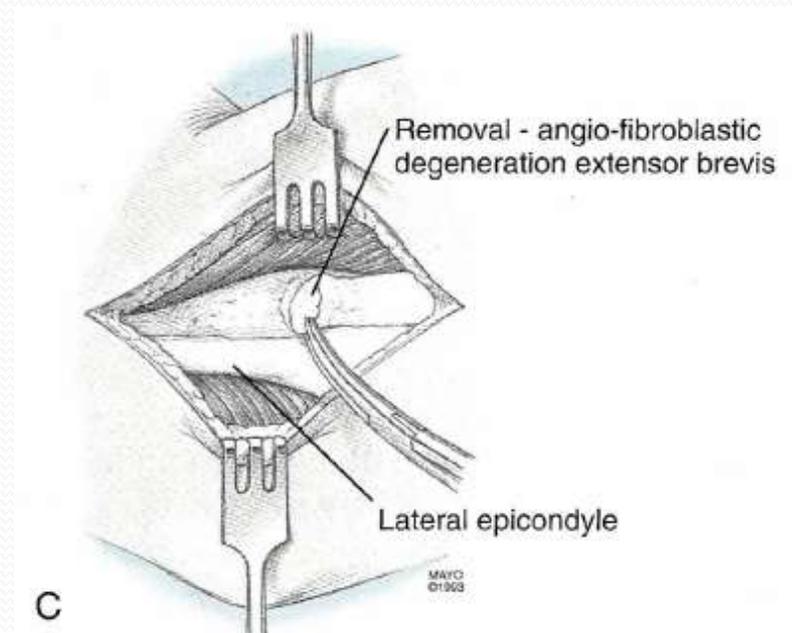
# Lateral Elbow Tendinosis

- Open release
  - Incise fascia at interface of ECRL and extensor aponeurosis to reveal ECRB



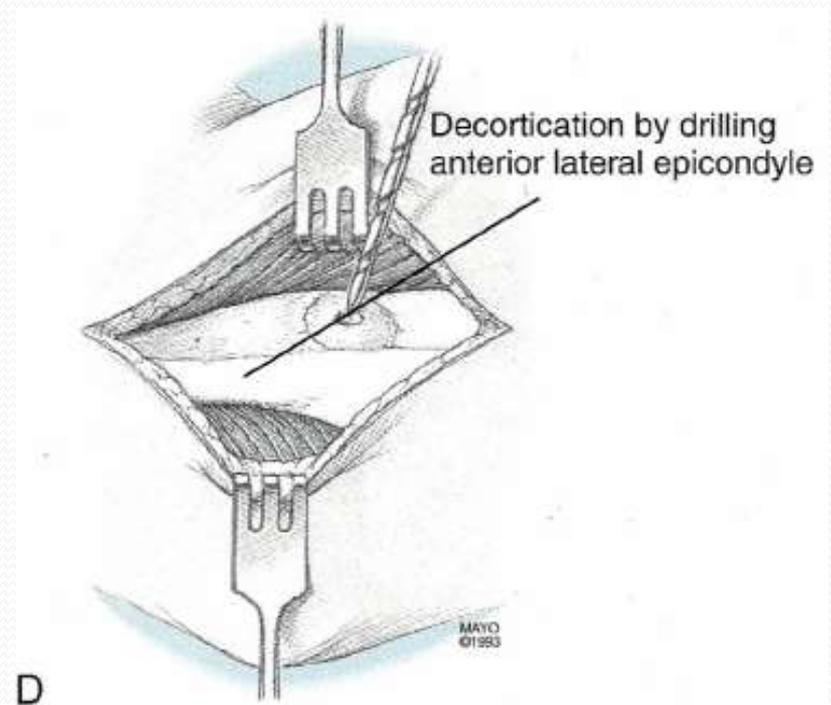
# Lateral Elbow Tendinosis

- Open release
  - Excise diseased tissue
  - A small arthrotomy can be made anteromedial to EDC aponeurosis to address intraarticular pathology such as posteromedial plica



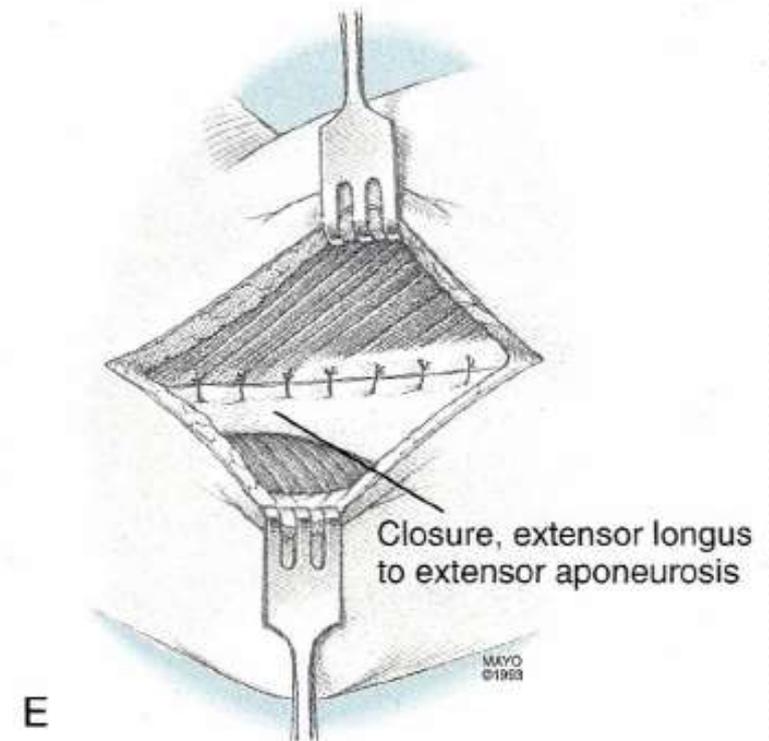
# Lateral Elbow Tendinosis

- Open release
  - Drill bone just distal and anteromedial to epicondyle to encourage vascular ingrowth
  - Do not drill epicondyle itself
    - Increased postop pain



# Lateral Elbow Tendinosis

- Open release
  - Closure of ECRL to extensor aponeurosis



# Lateral Elbow Tendinosis

- Open release
  - Results
    - 85-95% have improved pain
    - 85% return to full activity
    - Results maintained at 10-14 year followup
    - 3% no improvement
      - Misdiagnosis
      - Secondary gain
      - Supratentorial

# Denervation of the Lateral Humeral Epicondyle for Treatment of Chronic Lateral Epicondylitis

Nicholas E. Rose, MD, Scott K. Forman, MD, A. Lee Dellon, MD, PhD



## Denervation of the Lateral Humeral Epicondyle for Treatment of Chronic Lateral Epicondylitis

Nicholas E. Rose, MD, Scott K. Forman, MD, A. Lee Dellon, MD, PhD

- 30 elbows in 26 patients
- Mean F/U 34 months
- VAS pain score: pre-op 7.9/post-op 1.9
- 80% good to excellent results
- Grip elbow flexed: pre-op 21.8kg/post-op 28.4 kg
- Grip elbow extended: pre-op 13.4 kg/post-op 24 kg
- 5 failures, 4/5 had radial tunnel syndrome (RTS)

# Medial Elbow Tendinosis

- Epidemiology
  - 15-20% as common as lateral tendinosis
  - Most common cause of medial elbow pain
  - Peak incidence 3<sup>rd</sup>-5<sup>th</sup> decade
  - 2:1 male-to-female
  - 60% dominant side
  - 30% acute injury
  - Associated ulnar neuropathy in 50% of cases



# Medial Elbow Tendinosis

- Evaluation
  - Exam
    - TTP just distal to epicondyle in flexor pronator mass
    - Pain with resisted pronation
    - Pain with wrist flexion
    - Evaluate for valgus instability
    - Evaluate for ulnar neuropathy



# Medial Elbow Tendinosis

- Evaluation
  - Elbow radiographs
    - OA
    - Valgus stress radiographs if instability suspected
    - MRI in complex cases
  - NCS/EMG if ulnar neuropathy suspected



# Medial Elbow Tendinosis

- Differential diagnosis
  - Cervical radiculopathy
  - TOS
  - Shoulder level problems
  - Snapping medial head of triceps
  - Subluxation of ulnar nerve
  - Triceps tendinosis
  - MCL insufficiency
  - If postop, consider injury to MABCN



# Medial Elbow Tendinosis

- Classification
  - Type I: no ulnar nerve symptoms
  - Type IIA: Ulnar nerve symptoms with no objective deficit
  - Type IIB: objective deficits on exam or EMG



# Medial Elbow Tendinosis

- Nonoperative treatment
  - NSAIDs
  - Injections
    - With elbow in extension if subluxation of ulnar nerve
  - Activity modification
  - Wrist splinting
  - Counter-force bracing
  - Therapy
    - Strengthening and stretching
  - Nighttime extension splinting for ulnar nerve symptoms



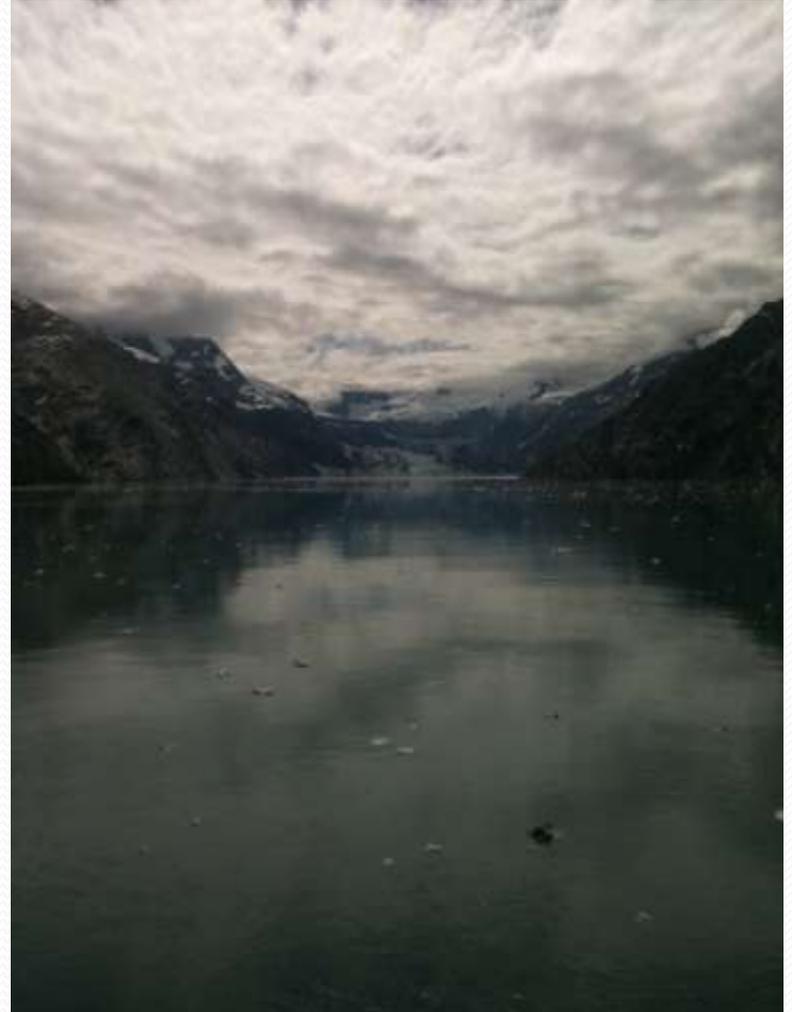
# Medial Elbow Tendinosis

- Operative indications
  - Failure of conservative management over 6 to 9 months
  - Progressive ulnar neuropathy



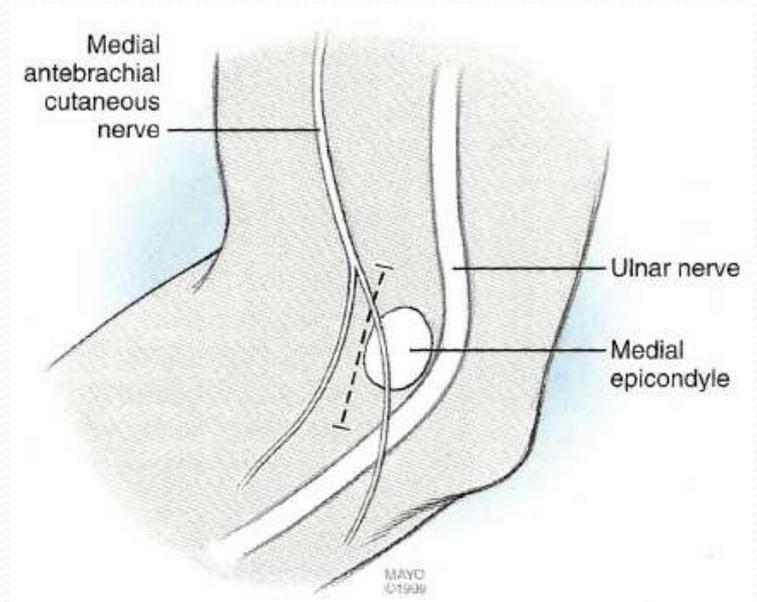
# Medial Elbow Tendinosis

- Surgical treatment
  - Type I: epicondylar debridement
  - Type IIA: epicondylar debridement and cubital tunnel release
  - Type IIB: epicondylar debridement with submuscular transposition



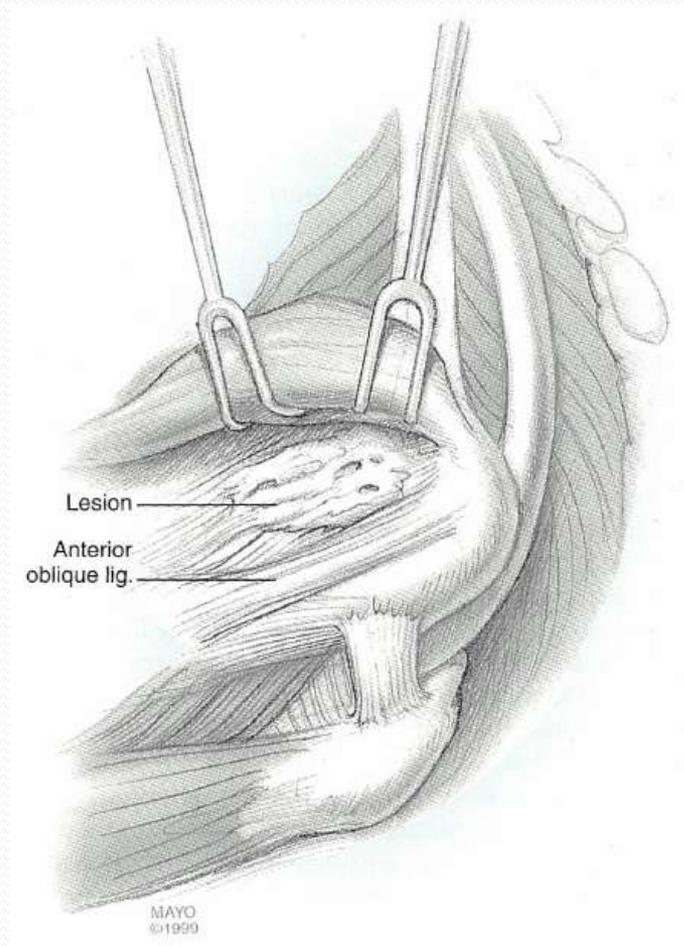
# Medial Elbow Tendinosis

- Surgical technique
  - 3cm incision just anterior to medial epicondyle
  - Protect MABCN
  - Incise flexor pronator fascia leaving 2mm rim attached to medial epicondyle for later repair



# Medial Elbow Tendinosis

- Surgical technique
  - Identify MCT
  - Identify and protect AOL
  - Resect abnormal tissue
    - Disconnects MCT from medial epicondyle
  - Repair flexor pronator fascia



# Medial Elbow Tendinosis

- Results
  - Nonop: 90-95% success
  - Surgical release
    - Type I and IIA
      - 95% good or excellent
      - 2/3 in 6 months
      - 1/3 up to 2 years
    - Type IIB
      - Poor results generally related to ulnar neuropathy

**THANK YOU**

