

MEDIAL EPICONDYLE FRACTURES

Demographic

20% of elbow fractures

60% of which are associated with elbow dislocation.

75% in boys between 6-12 years

20% of elbow dislocation with ME fracture, the ME is incarcerated in the joint.

Abstract

Traditional management by cast immobilization increasingly is being replaced with early fixation and mobilization.

Relative indications for surgical fixation include ulnar nerve entrapment, gross elbow instability, and fractures in athletic or other patients who require high-demand upper extremity function.

Absolute indications for surgical intervention are an incarcerated fragment in the joint or open fractures.

Radiographic assessment of these injuries and their true degree of displacement remain controversial.

mnemonic **CRITOE**)

predictable order:

2 yr Capitellum,

4 yr Radial head,

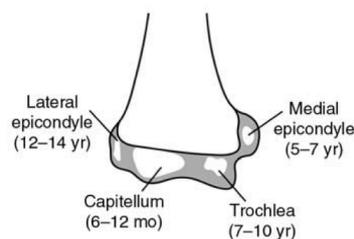
6 yr Medial (internal) epicondyle,

8 yr Trochlear, olecranon,

10 yr Lateral (external) epicondyle).

Anatomy

1. The distal humerus has 4 ossification centers. The capitellum is the first center to appear and the lateral epicondyle last to here.
2. The medial epicondyle is an apophysis as it does not contribute to growth.
3. The medial epicondyle is the last ossification



A



B

center to fuse to the distal humerus

4. It serves as the anatomic origin for the flexor-pronator mass

5. The ulnar collateral ligament originates from the most inferior portion of the ME.

The anterior band of the UCL is the major stabilizing ligament.

6. The ulnar nerve enters into the cubital tunnel

Mechanism of Injury

1. An avulsion mechanism involving an indirect muscular pull
2. With a direct blow, the medial epicondyle is typically fragmented.
3. Valgus stress on the elbow joint while falling on an outstretched hand

Classification [Papavasiliou]

Type 1 Undisplaced avulsion of the epicondyle

Type 2 Avulsed at the level of the joint

Type 3 Avulsed fragment trapped in the joint

Type 4 Avulsion of the fragment associated with

an elbow dislocation

Type 5 Chronic injuries: tension stress injuries

[Little League elbow syndrome]

This is rare but has been described by

Silberstein et al²⁹ and is caused by a direct blow or by avulsion of only a portion of the apophysis.



Diagnosis

1. Soft-tissue swelling
2. Decreased elbow ROM
3. An obvious elbow dislocation.
4. Medial stability of the elbow. A gravity-assisted valgus stress test :The test is performed with the patient lying supine and the arm abducted 90°. The shoulder and arm are externally rotated 90°, with the elbow held in 15° of flexion (to eliminate

the stabilizing force of the olecranon).

5. A vascular and neurologic examination

The ulnar nerve/ Median N

Imaging

AP and lateral radiographs are standard.

Pappas et al³² reported variable intraobserver agreement with regard to measurement of displacement of medial epicondyle fractures

CT can accurately determine the amount of displacement

Management

Management is controversial.

Management traditionally has been nonsurgical immobilization for 4 weeks in a long arm cast. Several studies have reported non-operative treatment fractures yields results similar to or better than those of surgery, even when healed with fibrous union.

Absolute indications

1. Open fractures
2. Fractured fragments incarcerated in the joint
3. Ulnar nerve dysfunction and valgus instability: Relative
4. High-demand upper extremity function.

5. No consensus exists in the literature as to the amount of fracture displacement that warrants surgical intervention? >15 mm of displacement

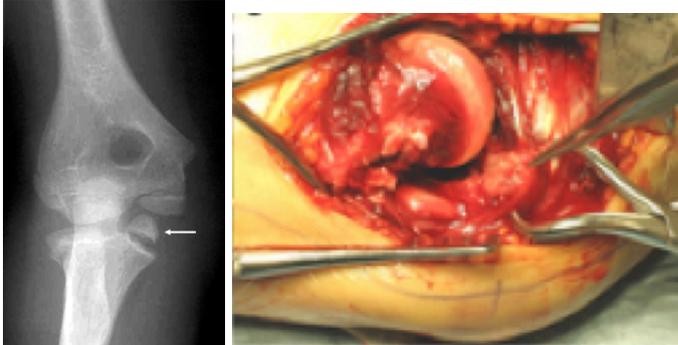
Multiple surgical interventions have been described, including suture repair, Kirschner wire (Kwire) fixation, screw fixation, biodegradable pins and excision of the epicondylar fragment and suturing of the soft tissue to the periosteum of the medial elbow.

Our recommended technique for fixation is to perform an open reduction with screw fixation. This allows for an anatomic reduction, rigid fixation, and early mobilization. The goal of surgical fixation in older (age >12 yr)



children should be to achieve

bony union. Growth is not interfered with use of the screw.



Incarcerated Medial epicondyle. Very often this fragment is seen only on lateral view

Outcomes

Surgical 92.5% rate of bony union

Nonsurgical 49.2% rate

No patient had loss of strength or of range of motion.

Fowles noted a 15° average loss of extension in their nonsurgical group (8 of 19 patients) and an average loss of 37° of extension in the surgically treated patients (6 of 9).

Complications

Aside from loss of motion, cubitus valgus, and bony nonunion, Septic arthritis, 4 myositis ossificans, wound infection, pin-tract infections, and even radial nerve injury. Also, no definitive evidence exists to support improved pain, elbow stability, or ulnar nerve dysfunction regarding surgical compared with nonsurgical management. Medial cutaneous nerve of the forearm is at risk of damage with open reduction and fixation.

Reference

1. JAAOS April 2012, Vol 20, No 4; 223
2. Silberstein J Bone Joint Surg Am 1981; 63(4):524-528.

3. Long term results 30 yrs: JBJS 2001: 1299