

Image Diagnosis: Capitellar Fracture

Ganesh Nagaraj, MD; Justin P Mitchelson, MD; Cameron M McFarland, MD; Matthew A Silver, MD

Perm J 2016 Spring;20(2):84

<http://dx.doi.org/10.7812/TPP/15-150>

CASE REPORT

A healthy 35-year-old man presented to the Emergency Department with left elbow pain and swelling after a ground-level fall onto his outstretched left hand while jogging. Physical examination revealed diffuse swelling and tenderness of the left elbow, most prominently over the distal humerus. Range of motion was markedly limited by pain. The patient's left upper extremity was neurovascularly intact.

X-rays of the patient's left elbow (Figures 1 and 2) revealed a displaced capitellar fracture. In Figure 2, the black arrow indicates disruption of the radiocapitellar joint, which is the articulation between the distal humerus and the radial head. The white arrow indicates a raised anterior fat pad and the resulting sail sign.

The patient underwent surgical pinning and had regained good function of the joint at four-month follow-up.

DISCUSSION

Capitellar fractures account for less than 1% of elbow fractures¹ and are most often caused by a fall onto an outstretched hand. Associated elbow injuries include radial head fractures, posterior elbow dislocations, and medial and lateral collateral ligament injuries.¹ Thorough evaluation of the wrist and shoulder for accompanying injuries is necessary. Neurovascular injury is uncommon in isolated fractures of the capitellum.

Diagnosis of capitellar fracture can be made most readily by examining lateral elbow images for alignment of the radiocapitellar line, which is drawn along the radial neck and

should bisect the capitellum in all views, and the anterior humeral line, which is drawn along the anterior edge of the humerus and should transect the middle third of the capitellum.² An oblique or radial head-capitellum view may assist in detecting a subtle fracture line. Elevated fat pads, such as a convex anterior fat pad producing a sail sign or any elevation of the posterior fat pad, suggest an underlying fracture. A computed tomography scan may be indicated in the appropriate clinical setting.^{2,3}

Displaced capitellar fractures frequently require prompt operative intervention in the form of open reduction and internal fixation to preserve the function of the joint. Fragment excision is often performed in comminuted fractures or for bone fragments that are too small for fixation. Isolated nondisplaced fractures, or those that have undergone successful closed reduction, may be managed nonoperatively with immobilization.^{1,4} ❖

Disclosure Statement

The authors have no conflicts of interest to disclose.

References

1. Cheung EV. Fractures of the capitellum. *Hand Clin* 2007 Nov;23(4):481-6. DOI: <http://dx.doi.org/10.1016/j.hcl.2007.08.001>.
2. Rosas HG, Lee KS. Imaging acute trauma of the elbow. *Semin Musculoskelet Radiol* 2010 Sep;14(4):394-411. DOI: <http://dx.doi.org/10.1055/s-0030-1263255>.
3. Mehdian H, McKee MD. Fractures of capitellum and trochlea. *Orthop Clin North Am* 2000 Jan;31(1):115-27. DOI: [http://dx.doi.org/10.1016/s0030-5898\(05\)70132-2](http://dx.doi.org/10.1016/s0030-5898(05)70132-2).
4. Rizzo M, Nunley JA. Fractures of the elbow's lateral column radial head and capitellum. *Hand Clin* 2002 Feb;18(1):21-42. DOI: [http://dx.doi.org/10.1016/s0749-0712\(02\)00011-2](http://dx.doi.org/10.1016/s0749-0712(02)00011-2).



Figure 1. Anteroposterior view x-ray of the left elbow. No definitive fracture line is seen.



Figure 2. Lateral view x-ray of the left elbow. The black arrow indicates a displaced capitellar fracture with disruption of the radiocapitellar joint. The white arrow indicates a raised anterior fat pad and resulting sail sign.

Ganesh Nagaraj, MD, is a Resident in the Department of Emergency Medicine at the San Diego Medical Center in CA. E-mail: ganesh.nagaraj@kp.org. Justin P Mitchelson, MD, is an Emergency Physician at the San Diego Medical Center in CA. E-mail: justin.mitchelson@kp.org. Cameron M McFarland, MD, is an Emergency Physician at the San Diego Medical Center in CA. E-mail: cameron.m.mcfarland@kp.org. Matthew A Silver, MD, is an Emergency Physician at the San Diego Medical Center in CA. E-mail: matthew.a.silver@kp.org.