

PERFORMANCE-BASED LEARNING & COMPETENCY-BASED TESTING



Rural Family and Emergency Medicine: Hand Fractures Case #1

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Physicians need to refresh their skills in commonly occurring injuries. In many places, subspecialist help is not available or affordable. These basic skills reflect the reality of community medical practice for a variety of specialties staffing rural emergency rooms, primary care offices, and mission hospitals.¹ For younger physicians, academic medicine teaches a curriculum of “Refer to Ortho.” Many fractures can be managed conservatively while maintaining quality in the community.² The trick is to know which ones require surgery.

A 23-year-old Latino construction worker injured his left hand in an arm wrestling contest two days ago. He is otherwise completely healthy. His vital signs are normal, and he is in no acute distress. He is right-handed. The left hand is swollen mainly on the dorsum and the proximal phalanx with maximal point tenderness on the third proximal phalanx. He has no insurance and speaks only Spanish. The image is shown on the right.

1. Adjectives for this fracture would include all but one of the following:

- a. Transverse
- b. Oblique
- c. Non angulated
- d. Spiral

Suggested Answer – B. This is an oblique fracture of the proximal phalanx. Oblique fractures are slanted fractures in which the line of the break runs obliquely to the long axis of the bone. Transverse fractures run perpendicular to the long axis of the bone. Angulation refers to the angle of the distal fragment measured from the proximal fragment. This is an example of a

non-angulated fracture. Spiral fractures, which are more unstable than oblique fractures, result from the bone twisting apart. A spiral break is visible on x-ray and can be distinguished from an oblique fracture by a component parallel to the long axis of the bone.²



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2. In terms of one fragment being displaced from the other, which statement best describes this situation?

- Although the fracture fragments are apart, there is sufficient proximity that union is likely without surgery.
- These fracture fragments are displaced to the point that surgery is the only choice for a good result.
- Since the fracture fragments are apart, nonunion is likely and the patient should be counseled to expect significant disability even if surgery is performed.
- Since the fracture segments are apart, nonunion is likely and the patient should be counseled to expect significant disability without surgery.

Suggested Answer – A. Phalangeal fractures that are nonangulated, nondisplaced, or stable following reduction are amenable to closed treatment with splinting and early rehabilitation. Indications for operative treatment of phalangeal fractures include: open fractures, irreducible fractures, unstable fractures, failed closed reductions, and displaced intra-articular fractures. Early finger mobilization and functional casting help prevent disability.³

3. If the patient decides on surgery, which statement describes the time surgery should be scheduled?

- Surgery should be scheduled for today.
- Surgery should be performed in the next 3-10 days.
- Surgery can be performed up to three weeks later.
- Surgery can be performed up to six weeks later.

Suggested Answer – B. Pain and swelling begin to resolve 12-24 hours after an initial fracture, and often surgery is not performed during this initial period. Surgery should be performed in the next 3-10 days, once swelling has improved, and prior to bone healing and remodeling. Performing surgery three to six weeks after a fracture is not recommended, as healing and remodeling may be almost complete, and permanent disability may occur if the rotation and alignment are not obtained and maintained during healing.³

To gain a better understanding, a second view of the hand is obtained.

4. From this additional image, the physician should conclude that the best conclusion is:

- The fracture is clearly comminuted.
- There is insufficient evidence to conclude that the fracture is comminuted.
- Comminution improves the stability of the fracture.
- Comminution promotes rapid healing.

Suggested Answer – B. This is a simple fracture of the proximal phalanx, not a comminuted fracture. A comminuted fracture has greater than two bone fragments.¹ Due to the multiple lines of fracture and multiple bone fragments comminuted fractures are more difficult to reduce, more unstable than simple fractures, and require longer healing time (on average one to two weeks longer).



5. Fractures that are comminuted are best described as:

- Needing surgery for optimal outcome.
- Managed variably dependent on location and nature of the fracture.

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c. Requiring Vitamin C 500mg PO TID to avoid complex regional pain syndrome.

d. More painful than fractures that are not comminuted.

Suggested Answer – B. Stability of phalangeal fractures depends on location, fracture orientation, and degree of initial displacement. Comminuted fractures are managed variably depending on location and nature of the fracture. For example, comminuted fractures with an intact periosteal sleeve and no initial displacement are usually stable and can be managed without surgery. Comminuted fractures are not necessarily more painful than simple fractures. Size, time since initial injury, and fracture location are all variables that can determine associated pain.³

A consultant is contacted by telemedicine. He requests a lateral image seen below.



6. The best statement describing the impact of the lateral image on the management of this case is:

a. Comminution is clearly seen on this view and surgery is indicated.

b. Comminution is not present and surgery is not required.

c. The view adds nothing to the diagnosis and management.

d. Medicolegal liability is reduced through the presence of a lateral view.

Suggested Answer – C. There is no evidence of a comminuted fracture on the lateral view. Anteroposterior and oblique views are sufficient to manage this fracture; the addition of a lateral view adds no additional information. Because no additional information is obtained by adding a lateral view, medicolegal liability is not reduced.

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