INSIGHTS IN IMAGES

CLINICAL CHALLENGE: CASE 1

In each issue, *JUCM* will challenge your diagnostic acumen with a glimpse of x-rays, electrocardiograms, and photographs of conditions that real urgent care patients have presented with.

If you would like to submit a case for consideration, please e-mail the relevant materials and presenting information to *editor@jucm.com*.

Wrist Pain in an Adult After a Fall

Figure 1.

Case

A 62-year-old woman presents with left wrist pain that began after she fell onto her outstretched left hand earlier in the morning while walking her dog. She has wrist pain throughout the range of motion, as well as some pain in her hand. She sustained no injuries to her head or neck, and she has no head pain, neck pain, chest pain, or shortness of breath.

View the image taken (**Figure 1**) and consider what your diagnosis would be.

Resolution of the case is described on the next page.

THE RESOLUTION

Differential Diagnoses

- Colles fracture (distal radius fracture with dorsal angulation of the fracture fragment)
- Smith fracture (distal radius fracture with volar angulation of the fracture fragment)
- Ulnar styloid fracture
- Scaphoid fracture
- Carpometacarpal dislocation

Physical Examination

On physical examination, the patient is found to be afebrile and to have a pulse of 112 beats/min, a respiration rate of 24 breaths/min, and a blood pressure of 146/93 mm Hg. She is alert and oriented, winces when she moves her left wrist, and has no respiratory distress.

Her left wrist does have evidence of deformity, but there are no breaks in the skin. She has a 3+ radial pulse, and sensation is grossly intact. She has no pain over the anatomic snuffbox. There are some superficial abrasions over the palmar aspect of her left hand, but they produce only very minimal discomfort with palpation. She has no elbow pain.

Diagnosis

An x-ray of the wrist (**Figure 2**) is ordered. Image findings indicate a Colles fracture, which is a distal radius fracture with dorsal angulation of the fracture fragment.

Figure 3 shows three views of a Colles fracture. Note that the carpal bones and bones of the hand are intact, and there is no ulnar styloid fracture.

Learnings

Wrist injuries account for 2.5% of emergency department visits. Lack of recognition of the fracture or improper treatment of it may lead to permanent functional disability. Injury to the distal radius requires assessment for concurrent injury to the carpal bones. The typical mechanism of injury with a Colles fracture is a fall onto an outstretched hand.

The distal radius is juxtaposed against the scaphoid and lunate carpal bones. The anatomic snuffbox is a triangular depression evident on the dorsoradial aspect of the wrist with extension of the thumb. This location should be palpated with *every* wrist injury, and the findings should be documented in the chart. For example, the documentation might read: "No pain with palpation at the anatomic snuffbox."

There are eight carpal bones.

- Four bones are across the bottom, from left (radial aspect) to right:
  - Scaphoid
  - Lunate
  - Triquetral
  - Pisiform
- Four bones are across the top row, from left (radial aspect) to right:
  - Trapezium
  - Trapezoid
  - Capitate
  - Hamate

What to Look For

Important elements of the medical history include mechanism of injury, location of pain and exacerbating factors, and examination of the joint proximal and distal to the injury. If there is an associated laceration, inquire about tetanus status. If the patient reports a clicking sensation, this may indicate a scapholunate ligamentous injury.

The physical examination should include documentation of inspection of the skin for swelling, abrasions, and lacerations; palpation of the area of greatest pain in the wrist (distal radius and ulna), as well as the metacarpal bones; and palpation of the anatomic snuffbox. The neurovascular status should be documented, including gross sensation and pulse.

A nondisplaced or minimally displaced fracture can be splinted, with orthopedic follow-up. Indications for follow-up in an emergency department or for expedited orthopedic follow-up include the following:

- An intra-articular fracture
- A significantly displaced fracture
- An open fracture
- A fracture in which there is significant swelling, causing concern that there may be a compartment syndrome
- A Colles fracture with the possibility of a carpometacarpal dislocation ■

Acknowledgment: Images courtesy of Life in the FastLane (http://lifeinthefastlane.com).

Finger Pain After Jamming During a Basketball Game


Figure 1.

Case

A 19-year-old college student presents to an urgent care center with pain at the distal interphalangeal (DIP) joint of the middle finger of his right hand. He reports that the pain started suddenly the previous evening when the finger was jammed while he was playing basketball. The pain is worse through the range of motion, but there is no numbness and no pain at the proximal interphalangeal (PIP) joint.

View the image taken (**Figure 1**) and consider what your diagnosis would be.

Resolution of the case is described on the next page.

THE RESOLUTION


Figure 2.

Differential Diagnoses

- Osteolytic lesion
- Finger dislocation
- Spiral fracture of the distal phalanx
- Comminuted fracture

Physical Examination

On physical examination, the patient is alert and oriented, is not in acute distress, and is breathing comfortably. He has a temperature of 98.4°F (36.8°C), a pulse of 92 beats/min, a respiration rate of 16 breaths/min, a blood pressure of 112/76 mm Hg, and an oxygen saturation of 99% on room air.

His right middle finger has slight swelling over the DIP joint, but there are no skin color changes. When the hand is held parallel to the ground, there is a palmar droop to the distal phalanx. The neurovascular status is intact, with good capillary refill. He experiences pain with palpation over the DIP joint, mostly dorsally. Strength testing does not result in active dorsiflexion, but the patient can actively perform palmar flexion at the DIP joint. He has no pain with palpation of the PIP joint.

Diagnosis

An x-ray is obtained that shows a mallet finger (**Figure 2**) with avulsion of the proximal aspect of the distal phalanx.

Treatment

Conservative initial treatment is the standard of care for type 1 injuries (closed injuries either with or without avulsion fracture) when there is an avulsion fracture involving less than one-third of the articular surface and no DIP joint subluxation. A splint can be applied to the DIP joint only; the PIP joint does not need to be immobilized. The DIP joint should be immobilized in full extension or slight hyperextension. Avoid excessive extension, because that may result in vascular compromise of the dorsal skin. Surgical management is typically reserved for patients with open fractures and severe injuries; these require transfer to an emergency department.

Learnings

Fingers are the fourth most common site of fractures in adults. Such fractures happen more commonly in men than in women, with the average age at occurrence being 36 years. The most common mechanism for a mallet finger injury is sudden, forced flexion applied to the distal aspect of a finger, such as in a blow against a fixed object or during sports such as basketball or football, causing hyperflexion or, rarely, hyperextension. The most commonly injured fingers are the index, ring, and middle fingers on the dominant hand. Injury to the extensor tendon may also occur from a laceration or a crush injury.

What to Look For

Look for the presence of visible deformity, and compare the injured finger to the other fingers. Assess the integrity of the skin, and look for swelling. Assess for open fracture, ecchymosis, and signs of infection such as erythema. The typical appearance of a mallet finger is seen from the lateral aspect; the distal phalanx is flexed. Palpate the dorsal aspect of the DIP joint, as well as the PIP and metacarpophalangeal (MCP) joints, for tenderness.

Assess strength by isolating the DIP joint: Stabilize the finger at the PIP and MCP joints and look for active extension of the finger by the patient. Also passively extend the finger. If the patient cannot do this, there may be entrapment of bone or soft tissue. Compare the injured finger to the other fingers. There is substantial variation in anatomy as well as age-related changes or arthritic changes, so a visible deformity is not necessarily diagnostic of injury or fracture. Check range of motion for flexion and extension, as well as lateral motion. If there is laxity laterally, this may indicate injury to a collateral ligament. Check the neurovascular status.

Obtain x-rays from three views: anteroposterior, oblique, and lateral. ■