



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.

A Fall from a Roof by an Adult

Figure 1.



Case

A 29-year-old woman presents to an urgent care center after a fall from the roof of her house, where she was cleaning the gutters. She reports that her right heel began hurting intensely immediately after the fall and that the pain worsened in the time it took for a family member to get her to the center. She cannot bear weight on her right leg. She mentions that she is a runner who often takes part in marathons and triathlons.

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 Diagnosis**

- Ankle dislocation
- Jones fracture
- Calcaneal fracture
- Talus fracture
- Bimalleolar fracture

Diagnosis

An x-ray (Figure 2) is obtained that shows a comminuted fracture of the calcaneus.

Learnings

Calcaneal fractures account for 1.2% of all fractures in adults, occurring most commonly at the age of 40 years, with the incidence three times higher in men than in women. Most injuries (71%) occur from a fall from a height, usually over 6 feet (1.8 m). When other injuries are present, they are most likely to be to the lower limbs (13%) or the spine (6%). There is significant morbidity with prolonged pain and disability, which is increased if the fractures are not recognized or appropriately treated. The poor prognosis may result from direct trauma to the articular surfaces, calcaneal fat pad, and peroneal tendons. Fractures are divided into intra-articular (75%), which involve the subtalar joint (more severe fractures having worse outcomes), and extra-articular (25%), which do not involve the subtalar joint (these often have a favorable outcome).

The calcaneus is the first bone to be impacted with walking or with a fall from a height. Depending on the position of the foot (valgus or varus), the overlying talus bone will transmit a force to a unique portion of the calcaneus, resulting in specific types of fractures.

What to Look For

When obtaining the medical history, ask questions about the following.

- **Onset:** Ask whether the onset was gradual versus sudden. Most often, the mechanism will be a fall from a height with sudden onset of pain.
- **Location:** The typical location is over the heel, but there may be referred pain, so even with a mechanism of ankle strain, palpate the heel.
- **Duration:** The typical timeline involves the patient seeking immediate medical care, though if there are extenuating circumstances, such as substance use, assault, or abuse, the patient may delay seeking care.
- **Severity:** Pain is typically severe and increases with any attempt to bear weight.
- **Other trauma:** Ask about trauma to the ankle, leg or hip pain, intraabdominal pain, or pain in the chest, neck, and head.
- **Social history:** Inquire about occupation, alcohol or substance use, and any possibility of assault.

Do the following during the physical examination:

- Examine the foot, ankle, knee, and hip.
- Inspect the foot for signs of swelling, abrasions, and lacerations. Ecchymosis is not a sensitive finding but is specific for a calcaneal fracture.
- Palpate the heel and ankle.
- Assess the range of motion, unless there is severe pain.
- Check the neurovascular status, and document the pulses (dorsalis pedis and posterior tibial) and gross sensation.
- Look for compartment syndrome, which may be a consideration with massive swelling. It is present in 10% of patients with a calcaneal fracture, and it is typically caused by a high-energy deceleration injury.

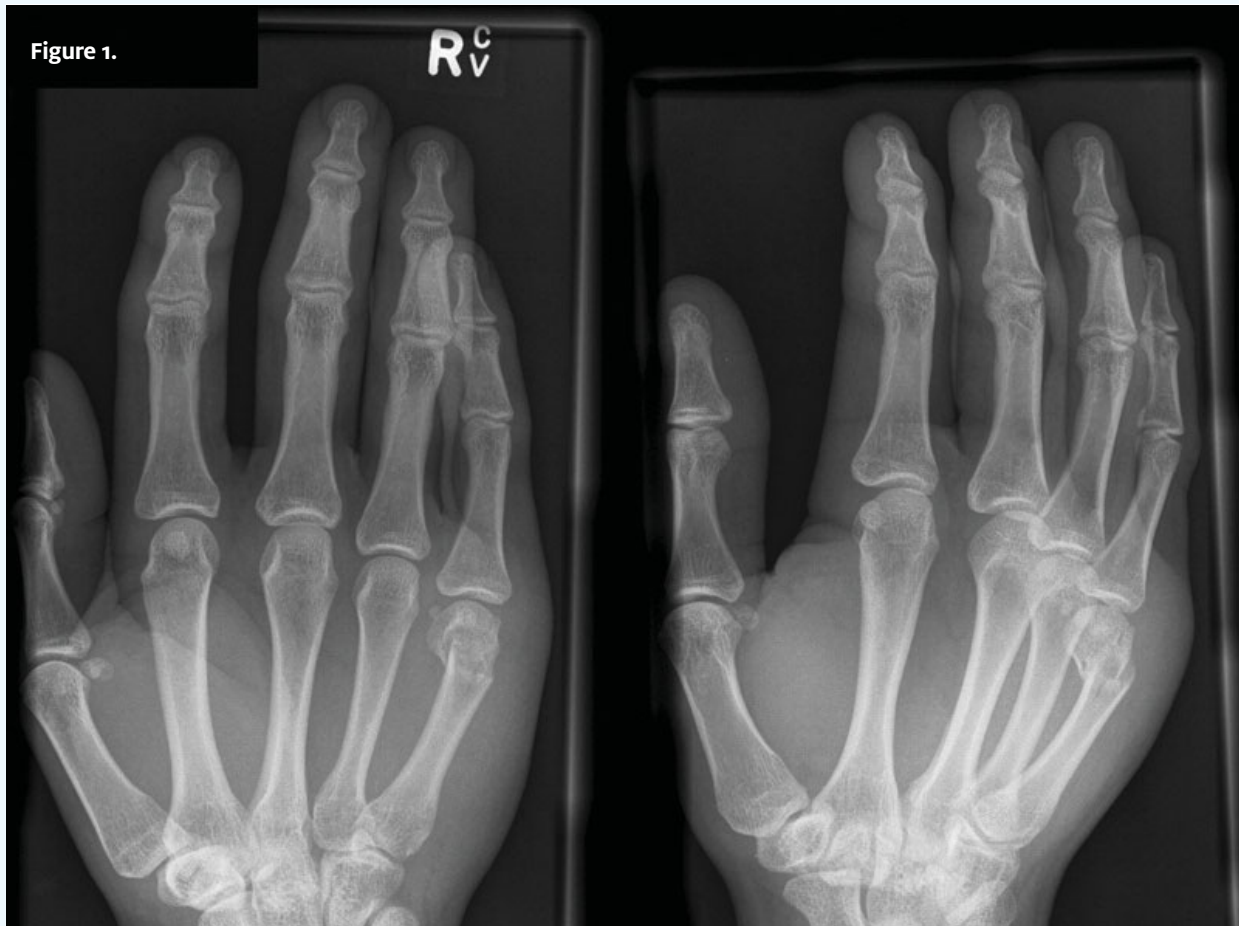
Most of these patients will be sent to an emergency department. Indications for transfer include the following:

- Open fracture
- Severe pain
- Possibility of compartment syndrome
- Neurovascular compromise
- Fractures with dislocation
- Possible comorbid conditions such as coagulopathy, anti-coagulant use, immunosuppression, and difficulty with ambulation at baseline

Acknowledgment: Figure 1 is used with permission under a GNU Free Document License, Version 1.2, from Jojo. Original figure available from https://upload.wikimedia.org/wikipedia/commons/e/e8/Calcaneus_Fracture.jpg. ■



Pain in the Hand After Punching a Wall



Case

An 18-year-old man presents to an urgent care center with pain at the distal aspect of the metacarpal bone of the little finger. The pain began 2 hours earlier, after he punched a wall. He has pain with range of motion and a minimal amount of numbness in the finger. He reports that he has no other injuries.

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 Diagnosis**

- Osteoarthritis
- Mallet finger
- Gamekeeper's thumb
- Rheumatoid arthritis
- Osteosarcoma

Physical Examination

The patient is afebrile, he has a pulse rate of 120 beats/min, his respiration rate is 20 breaths/min, and his blood pressure is 110/89 mm Hg. He is alert and oriented, is not in acute distress, but is holding his right hand in his lap. There is swelling of the hand, and he experiences a moderate amount of pain with palpation over the metacarpophalangeal (MCP) joint of the little finger. He has pain with even a minimal range of motion. He has no tenderness over the proximal interphalangeal or distal interphalangeal joints of the little finger or over the MCP of the ring finger. His wrist is not tender with palpation, and it has good range of motion. The neurovascular status is intact, with a 2+ radial pulse, and sensation is grossly intact.

Diagnosis

A hand x-ray (Figure 2) is obtained that confirms a fracture of the distal metacarpal bone of the little finger with 30° of angulation. The patient has a boxer's fracture.

Learnings

A boxer's fracture is a distal metacarpal fracture of the middle, ring, or long finger. It is one of the most common hand injuries occurring in young males who strike an object such as a wall or a face with a closed fist.

The mechanism is typically a blunt force against the MCP of the little finger. Note that a very vigorous mechanism may result

in a carpometacarpal dislocation or an open fracture. A fracture resulting from a fight where the hand comes in contact with a mouth can result in oral organisms causing a skin or bone infection. These injuries are called closed-fist injuries, or fight bites. Patients may be reluctant to reveal the etiology of the injury for fear of legal or other issues. Injuries often present with a laceration over the MCP joint of the middle, ring, or little finger.

What to Look For

The physical examination should include the following:

- Inspection of the skin for swelling, abrasions, and lacerations
- Palpation of the area of greatest pain as well as the joint proximal and distal to the injury
- Assessment of strength; strength may be preserved with up to 90% disruption of a tendon
- Assessment of neurovascular status; document sensation and pulse or capillary refill

By using a stepwise approach to evaluation of a hand x-ray, the clinician can avoid missing important findings. Start with the metacarpal bones, looking for alignment, signs of soft-tissue swelling (indicating location of greatest injury), and fracture. Watch for

- A break in the cortex on any of the three x-ray views
- Disruption in trabeculations
- Lucency within the bone
- Angulation or impaction

Next, evaluate the bones of the wrist (carpal bones) for fracture or dislocation. Obtain a dedicated wrist x-ray if there is any wrist pain with palpation or range of motion.

Should a boxer's fracture be reduced, or should it be splinted? If there is angulation of <40° of the fracture, this will not result in loss of function and does not require reduction. The patient should be cautioned that there may be a cosmetic deformity. Provide ice, immobilization with an ulnar gutter or volar splint, elevation, and a referral to an orthopedist or hand surgeon within 2 or 3 days.

The following are indications for transfer to an emergency department:

- Open fracture
- Carpometacarpal dislocation
- Open wound with infection
- Osteomyelitis
- Intractable pain ■