



Clenched Fist Injury



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Ronald's case

Ronald, a 47-year-old right-hand dominant man presents to the ED with a laceration over his first knuckle (Figure 1). He states that he was in an altercation 24 hours previously and that he struck another male in the face. Ronald complains of increasing pain, swelling and inability to move his hand.

Ronald also states that he is healthy, but uses IV drugs on occasion.

His vital signs are:

- Heart rate 105 bpm
- Respiratory rate 16 breaths per minute
- BP 120/56 mmHg
- Temperature 37.8° C

On exam, there is a 2 cm laceration over the proximal metacarpophalangeal (MCP) joint of the right index finger. There is also marked tenderness around the laceration, corresponding to warm and indurated skin. Any movement of the MCP joint results in severe discomfort.

Read on for more on Ronald...

Questions & Answers

1. *What is a clenched fist injury?*

Clenched fist injury (CFI), also known as “fight bite,” is a wound on the dorsum of the hand near a metacarpophalangeal (MCP) joint, often due to a patient having struck another individual in the mouth area with a closed fist. Patients presenting with CFI are often males between the ages of 10 and 34 years with a history of being in an altercation and the consumption of alcohol.

As a result, either the blunt force or a tooth may lacerate the skin near a MCP joint, the third MCP joint being the most common. Deeper structures such as tendon, cartilage, bone and/or the joint space itself are involved 75% of the time and commonly result in infection. Oral flora (*Staphylococcus aureus*, *streptococci*, *Eikenella corrodens*, gram-negative bacilli and anaerobes) may be introduced into the patient's hand at the site of the laceration. Tendons, cartilages and joint spaces involved in CFI are particularly susceptible to infection due to relative avascularity of tendon sheaths. In addition, upon extension of the involved digit and tendon, the organisms may migrate proximally.

2. *How should Ronald be approached in the ED?*

Patients typically present days after the incident with a hand that has subsequently become painful and inflamed (*i.e.*, swollen, erythematous and restricted range of motion) and may have systemic signs of infection. It is therefore imperative to perform a full musculoskeletal and neurological examination of the



Figure 1. Laceration on Ronald's right hand.

hand and limb, including extensor tendon function. X-rays of the hand are necessary to identify any foreign bodies (*i.e.*, tooth fragments) which may be present within the hand, as well as damage to the proximal phalanx, the MCP joint or metacarpal fracture.

3. *How should Ronald be managed in the ED?*

Due to the potential complications of CFI, such as septic arthritis, tenosynovitis and osteomyelitis, aggressive management and consultation with a hand surgeon is recommended for all cases. Analgesics should be administered as required and the wound should then be thoroughly explored, irrigated and left open to heal by secondary intention. The wound should be swabbed, to its deepest extent, for Grain stain, aerobic and anaerobic culture prior to the administration of antibiotics and a tetanus booster should be given as necessary. The hand should be splinted in the position of function with immobilization and elevation.

Antibiotic prophylaxis should be prescribed. Recommended treatment regimens include:

- amoxicillin-clavulanate potassium; or
- penicillin (to cover *Eikenella corrodens*) plus an antistaphylococcal penicillin (such as cloxacillin) or
- penicillin with a first-generation cephalosporin.

For patients who are allergic to penicillin, a fluoroquinolone or trimethoprim-sulfamethoxazole should suffice.

4. *What else should be considered?*

As a result of the force involved in CFI, it is possible that Ronald has been exposed to pathogens of the recipient of the blow. Cleansing of the wound should be performed expediently and thoroughly with the use of soap, water and 1% povidone-iodine. Hepatitis B and HIV preliminary testing should be performed with a follow-up test scheduled for six months later. Hepatitis B and HIV prophylaxis should also be considered.

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Although patients may be initially managed in the ED, follow-up should be arranged with a hand specialist as soon as possible.

5. *What should be the disposition of Ronald?*

IV antibiotic administration and admission to hospital should be considered for all patients and in particular those with:

- Diabetes or peripheral vascular disease
- An immunocompromised state (secondary to disease or medications)
- A wound older than 24 hours
- A wound that involves injury to the extensor tendon, joint capsule, or bone
- Demonstrated potential for non-compliance with antibiotic therapy and/or who may not return for follow-up care as directed
- Systemic symptoms (e.g., fever, chills)
- Cellulitis

Although patients may be initially managed in the ED, follow-up should be arranged with a hand specialist as soon as possible. If the tendon and/or joint is not affected, there is no foreign body present within the wound and the patient has presented < 24 hours after the incident, they may be a candidate for treatment as an outpatient if follow-up can be assured. 

Resources

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