Fighter's Folly

Trevor Hamilton; and Janet MacIntyre MD, FRCPC

Peter's case

Peter, 22, presents to the ED with a swollen right hand after getting into a fight two nights ago. He feels sharp pain when he moves his fourth or fifth digits and complains of swelling and tenderness. He denies any numbness or paresthesias.

He is right-handed and his tetanus status is up to date.

Examination

A medical examination notes the following:

- There is a laceration along the metacarpophalangeal (MCP) joint of his fifth digit on the dorsal aspect of his right hand (due to a human bite)
- His hand is swollen, erythematous, warm and tender to palpation
- There is normal capillary refill of the nails
- Sensory examination is normal
- He has limited range of motion but exhibits no scissoring

An x-ray is taken (Figure 1).

Questions

1. What is the diagnosis?
2. What is the management of a human bite?
3. What is the management of a boxer's fracture?
4. What would indicate a hand surgery referral?

Read on to find out the answers to these questions.

Questions & Answers

1. What is the diagnosis?

Peter has a fracture of the metacarpal neck of his fifth digit (also known as a boxer's fracture). This is the most common metacarpal fracture and one of the more common fractures of the hand. The injury is termed a boxer's fracture because it almost exclusively occurs when an individual strikes a solid object with a closed fist.

Peter also has a human bite wound. Any laceration along the metacarpophalangeal (MCP) joint should have a high suspicion for a human bite unless it can be proven otherwise. The closed-fist injury bite (caused when an individual's closed fist strikes the teeth of another individual) is notorious for its high incidence (25% to 50%) of infectious complications. Most of these infections already exist when the patient first presents to the physician. Infections resulting from human bite wounds of the hand are usually polymicrobial. *Eikenella corrodens*, an anaerobic gram-negative rod present in the normal flora of the mouth, complicates 25% to 29% of infections. The aerobic pathogens (*Streptococcus* species and *Staphylococcus aureus*) present in normal skin flora are the most common.

2. What is the management of a human bite?

Most human bite wounds can be treated as ordinary lacerations. However, human bite wounds of the hand are associated with a high incidence of infection. When treating a closed fist injury, a hand radiograph should be obtained, looking for:

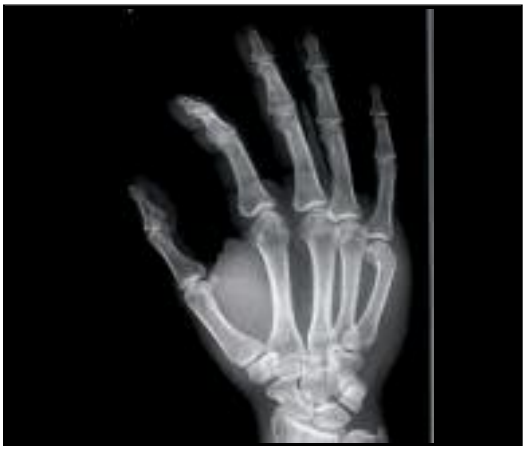

Figure 1. X-ray showing a fracture of the metacarpal neck of the fifth digit.

- Fractures
- Dislocations
- Foreign bodies
- Air in the joint

The laceration should be examined for foreign bodies, tendon laceration and joint penetration under local anesthetic. If a tendon laceration is discovered, joint penetration should be presumed. The wound should be irrigated and debrided. A dry, sterile dressing should be applied to the wound. Suturing should not be attempted due to the high risk of infection.

Antibiotic treatment depends on the initial presentation of the patient. Patients presenting with infected human bite wounds of the hand should receive IV antibiotic therapy with:

- cefuroxime,
- piperacillin/tazobactam, or
- cefoxitin.

For patients presenting with uninfected wounds, amoxicillin/clavulanate is appropriate. In addition, the patient's tetanus status should be ascertained.

3. *What is the management of a boxer's fracture?*

The majority of boxer's fractures do not require surgery. Management for a boxer's fracture is dictated by the degree of rotation and angulation of the fifth digit. No rotational deformity is acceptable due to the resultant overlap of the fourth and fifth digits and a reduction in grip strength. Rotation can be assessed by inspecting the plane of the nails when the digits are extended and by ensuring that all digits point towards the scaphoid tubercule when the MCP and proximal interphalangeal (PIP) joints are flexed to 90˚. The acceptable degree of angulation of the fifth digit is greater than that of the other digits because there is more mobility

Mr. Hamilton is a Fourth Year Medical Student, Dalhousie University, Halifax, Nova Scotia.

Dr. MacIntyre is an Emergency Physician, Queen Elizabeth II Health Sciences Centre, Halifax, Nova Scotia.

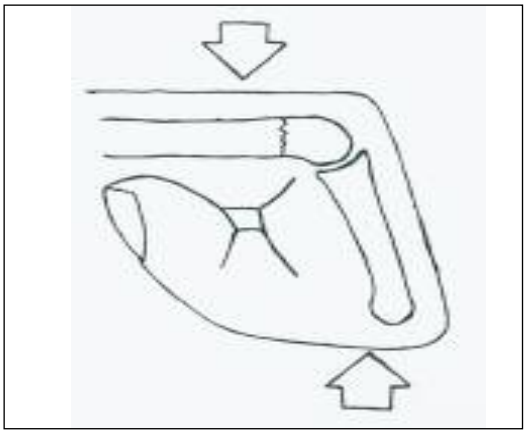

Figure 2. Closed reduction method with 90˚ flexion of MCP and proximal interphalangeal joints.

in the carpometacarpal joint that can accommodate for the deformity. In general, metacarpal neck fractures of the fifth digit, with an angulation < 45˚, do not require treatment with closed reduction (Figure 2).

A closed reduction begins with a hematoma block to anesthetize the hand of the patient. Traction should be applied to disimpact the fracture. The MCP, PIP and distal interphalangeal (DIP) joints should then be flexed to 90˚. Volar directed force is applied over the metacarpal shaft and simultaneously, a dorsally directed force is applied to the PIP joint. Post-reduction, the arm should be immobilized with the wrist extended at 30˚ and the MCP joint flexed at 90˚. The splint should extend to, but not include, the PIP joint. The splint should be worn for three to four weeks, but PIP and DIP mobility can begin immediately.

4. *What would indicate a hand surgery referral?*

Referral to a hand surgeon is indicated if adequate reduction cannot be maintained, if any rotational deformity is present or if a human bite wound of the hand is infected. A closed reduction and percutaneous pinning with K-wires will often correct unstable fractures. Rarely, a patient will require an open reduction. Dx

Resources
1. Ashkenaze D, Ruby L: Metacarpal fractures and dislocations. Orthop Clin North Am 1992; 23(1):19-33.
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3. Marx J, Hockberger R, Walls R, et al: *Rosen's Emergency Medicine: Concepts and Clinical Practice*. Fifth Edition. Mosby Inc, St. Louis, Missouri, 2002. pp. 513-14, 780-3.
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STA Communications Inc.
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***This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Feedback can be sent to* diagnosis@sta.ca.**