



Chapter 30

FINGER FRACTURES AND DISLOCATIONS

KEY FIGURES:

Rotational deformity
Buddy taping
Reduction of metacarpal fracture

Because we use our hands for so many things, finger fractures and dislocations are common injuries. Unless they are associated with significant soft tissue injury, definitive treatment is not emergent. Often the initial evaluation and necessary splinting can be done by a nonspecialist.

This chapter describes basic treatments for finger fractures and dislocations that can be done by all health care providers. For the best possible outcome, however, more highly technical procedures may be required. Whenever possible, patients with all but the simplest injuries should be referred to a hand specialist for definitive treatment.

An occupational therapist also should be consulted to help with rehabilitation once the fracture or dislocation has been properly treated.

In areas where specialists are not available, the basic interventions discussed in this chapter can help the patient attain an acceptable functional outcome.

Definitions

To **reduce** a fracture or dislocation means to restore the proper anatomic and functional alignment of the bone or joint. For most hand injuries, functional status is most important to the patient.

An **open** fracture or dislocation implies a wound in the soft tissues overlying the bone injury. In a **closed** injury the surrounding skin is intact. This distinction is important. An open fracture or dislocation has a high risk for infection. To prevent this complication, careful and thorough wash-out of the wound is required. The patient also should be given antibiotics (the oral route is usually sufficient, but extent of injury is the determining factor) for at least 48 hours after the repair. A

closed fracture or dislocation is not associated with a high risk of infection; thus, the patient does not require treatment with antibiotics.

Finger Fractures

Compared with leg fractures, finger fractures may seem to be insignificant injuries. However, finger fractures can be quite problematic. Without proper treatment, a finger fracture can lead to significant limitation in hand function and disability.

Anesthesia

Administer a digital block before attempting to reduce a fracture. Use a combination of lidocaine and bupivacaine whenever possible to help with postprocedure pain control.

Distal Phalangeal Fractures

The distal phalanx is the most commonly fractured bone of the finger. Distal phalangeal fractures are classified into three types: tuft fractures, shaft fractures, and intraarticular fractures.

Tuft Fractures

A tuft fracture involves the most distal portion of the bone. It usually is caused by a crush mechanism, such as hitting the tip of the finger with a hammer. A tuft fracture is often an open fracture because of its common association with injury to the surrounding soft tissues and/or nail bed. Even without injury to surrounding soft tissue, the fracture is considered open in the presence of nail bed injury.

Treatment

1. The soft tissue wound should be cleansed thoroughly, and all foreign material should be removed.
2. In patients with a subungual hematoma > 50% of the nail surface, consider removing the nail to allow repair of the nail bed (see chapter 29, "Fingertip and Nail Bed Injuries").
3. Soft tissues should be sutured loosely in an interrupted fashion. Use 4-0 nylon or chromic material. Repair the nail bed with 5-0 or 6-0 chromic sutures. Repair of soft tissues usually leads to adequate reduction of the fracture.
4. Cover the suture line with antibiotic ointment and dry gauze. The dressing should be changed daily.
5. Keep the finger elevated as much as possible.

6. Strongly advise the patient to avoid smoking. Tobacco products slow the healing process.
7. Provide pain medication. Tuft fractures are often quite painful and tender for several days.
8. The patient may wear a protective splint or bulky dressing over the fingertip and distal interphalangeal (DIP) joint to prevent movement. The splint also protects the finger from accidental reinjury. However, do *not* immobilize the entire finger with the dressing or splint. Complete immobilization leads to unnecessary finger stiffness.
9. Once the finger is less tender (usually within 10–14 days), encourage the patient to gradually resume normal use of the finger.

Shaft Fractures

Shaft fractures involve the central portion of the distal phalanx. They also are associated often with soft tissue or nail bed injuries. As described above, repair of any soft tissue usually leads to adequate reduction of the fracture.

For further bone stabilization, a 20-gauge needle can be passed manually from the end of the fingertip into the bone segments. This procedure should be done before repair of any soft tissue injury (if present). The needle easily passes through the soft tissues into the bone if it is pushed firmly with a twisting motion. Bend the top part of the needle (the hub) so that it does not protrude too far from the end of the fingertip.

Basically, shaft fractures are treated like tuft fractures. If a needle is used to stabilize the fracture, remove it when the fingertip is no longer tender.

Intraarticular Fractures

Intraarticular fractures involve the joint surface of the distal phalanx at the DIP joint. The patient may present with a mallet deformity (inability to extend the DIP joint fully) if the fracture involves the bony insertion of the extensor tendon. In this setting, treat the finger like a mallet finger, as described in chapter 32, “Tendon Injuries of the Hand.”

If there is no evidence of mallet deformity, the joint surface should be aligned as meticulously as possible to ensure optimal function. Such injuries are best referred to a hand specialist. If no specialist is available:

1. Manipulate the finger to align the bone pieces as precisely as possible.
2. Immobilize the DIP joint in 0–10° of flexion for 10–14 days. You can use a plaster splint or make a splint from a tongue depressor. Alternatively, the 20-gauge needle technique (described above) can be used to immobilize the DIP joint.

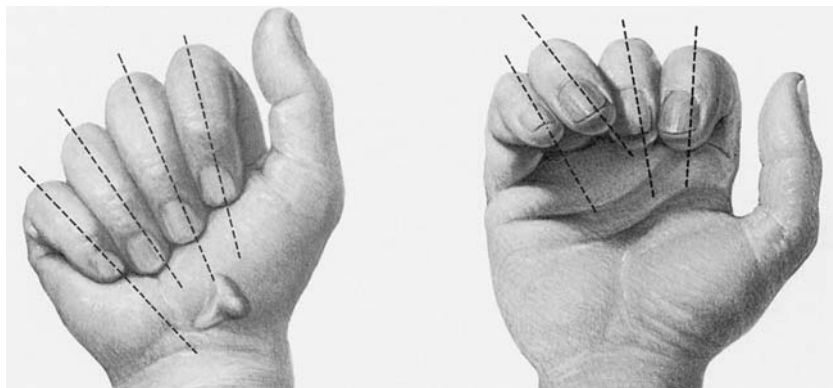
3. However you immobilize the joint, be sure to allow motion of the proximal interphalangeal (PIP) joint.
4. When the finger is no longer tender, the patient should start moving the joint both passively and actively in hope of regaining functional range of motion at the DIP joint.

Middle and Proximal Phalangeal Fractures

Middle and proximal phalangeal fractures are classified according to whether they involve the joint surface.

Extraarticular Fractures

Extraarticular fractures affect the part of the bone that is not involved with the joint surface. The main concern is whether a rotational deformity is present when the patient attempts to bend the fingers. See chapter 26, "Normal Hand Exam," for discussion of rotational finger alignment.



Any malrotation associated with metacarpal or phalangeal fractures must be corrected. *Left*, Normally all fingers point toward the region of the scaphoid when a fist is made. *Right*, Malrotation at the fracture site causes the affected finger to deviate. (From Crenshaw AH (ed): Campbell's Operative Orthopaedics, 7th ed. St. Louis, Mosby, 1987, with permission.)

If no rotational deformity is present, the finger can be treated by buddy taping for 2–3 weeks until the finger is no longer tender. Buddy taping is used to initiate gentle movement of the injured finger while maintaining proper bone alignment. The injured finger is taped to the adjacent finger, and the patient is instructed to use the hand as normally as possible.

Table 1. Which Fingers to Use for Buddy Taping

Injured Finger	Finger Used for Buddy Taping
Index	Long
Long	Index
Ring	Long
Little	Ring

Buddy taping. To promote protected motion of the injured finger, secure it to an adjacent noninjured finger.



If a rotational deformity is present, give a digital block, and try to align the bone by manipulating the finger. Then place the finger in a volar splint.

If the fracture involves the proximal phalanx, the splint should immobilize the PIP joint in 0° of flexion and the metacarpophalangeal (MCP) joints in 70° of flexion. If the fracture involves the middle phalanx, the splint should immobilize both the DIP and PIP joints in 0° of flexion. The splint should be worn for 2–3 weeks until the tenderness over the fracture site has resolved.

After removing the splint, buddy-tape the finger for an additional 1–2 weeks. This approach initiates gentle movement of the affected finger and improves motion of the joints.

Fractures with a rotational deformity should be treated by a hand specialist if one is available.

Intraarticular Fractures

Intraarticular fractures involve the portion of bone that makes up the joint surface. Proper reduction is required to obtain adequate range of motion and finger function once the bone has healed. Intraarticular fractures usually require operative exploration for proper bony stabilization (with pins or screws) and thus should be treated by a hand specialist if one is available. If no hand specialist is available, try the treatment described for extraarticular fractures.

Metacarpal Fractures

Metacarpal fractures are included in this chapter because they can affect the position and function of the affected finger. A poorly aligned metacarpal fracture can cause a rotational deformity.

Metacarpal fractures may occur anywhere along the bone. Many require some type of pin fixation or stabilization for optimal treatment. Therefore, you should consult a hand specialist whenever possible.

If no specialist is available, begin by checking finger rotation. If the fingers maintain proper alignment and the fracture looks reasonably well positioned on radiographs, a short period (2–4 weeks until the fracture site is no longer tender) of cast or splint immobilization may be all that is required.

If a rotational deformity is present, reduction and manipulation must be performed before immobilization.

Fracture Reduction

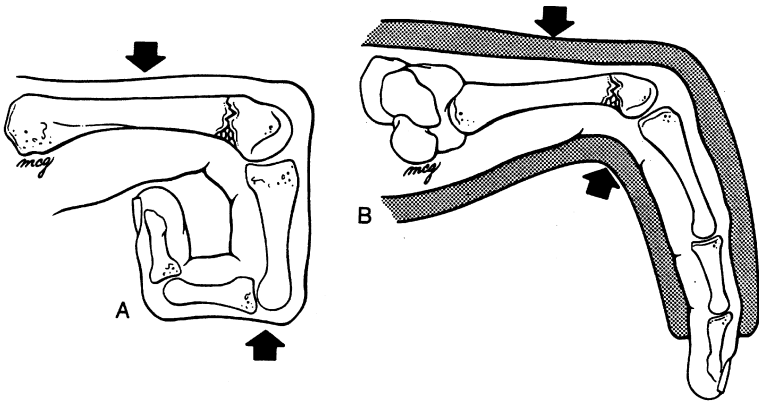
Before the fracture is reduced a wrist block or a hematoma block should be given for pain control.

Hematoma Block

1. Draw up 3–5 ml of lidocaine in a syringe.
2. Clean the area overlying the fracture with alcohol or povidone-iodine solution. This procedure must be done under **sterile conditions** so that you do not contaminate the area around the fracture site and cause an infection.
3. Insert the needle into the tissues overlying the fracture until the tip of the needle contacts bone. Then back up the needle a few millimeters and inject 1–2 ml of solution.
4. Without completely removing it from the skin, back up the needle and reposition the tip by a centimeter or so. Then inject the rest of the solution.

Reduction Procedure

1. Start by flexing the MCP joint.
2. Apply downward pressure on the dorsal side of the fracture and exert upward pressure at the MCP joint until you feel the bone fragments move into the proper position.
3. Recheck finger alignment to ensure that the rotational deformity has been corrected. Repeat this procedure until proper alignment is achieved.



Reduction of a metacarpal fracture. Arrows indicate the direction of pressure application for fracture reduction. (From Green DP, et al (eds): *Operative Hand Surgery*, 4th ed. New York, Churchill Livingstone, 1999, with permission.)

4. Immobilize the hand with a cast or splint that includes the wrist (20–30° of extension) and MCP joints (60° of flexion). The interphalangeal joints can be left free so that you can monitor for rotational changes in the fingertips.
5. If you place the hand in a cast, be sure to use several layers of padding to protect the skin, and do not wrap the plaster too tightly.
6. The initial swelling from the injury should decrease after a few days. Therefore, the cast may need to be changed 5–7 days after injury to ensure adequate immobilization of the fracture site.
7. The hand should be immobilized for 3–4 weeks. Watch for changes in the position of the fingertips, which may be a sign that the reduction has slipped. If so, repeat manipulation of the fracture is required.
8. When the fracture site is no longer tender, the patient can begin to use the hand for light activity. Gradually increase activity over the next few months, as tolerated by the patient.

Joint Dislocations

For treatment purposes, finger joint dislocations can be classified as either simple or complex. A **simple dislocation** involves no fracture of the bone and can be reduced easily. A **complex dislocation** is not reducible or is associated with fracture of one of the involved bones. The main concern is whether the dislocation is reducible.

Simple MCP Joint Dislocations

Reduction of an MCP joint dislocation demands particular care. An incorrect reduction can change a simple dislocation into a complex one.

Reduction Technique

1. You may need to give a wrist block or gentle sedation for pain control.
2. Flex the wrist to keep the flexor tendons slack.
3. Avoid pulling on the finger and placing extension forces onto the joint.
4. Apply direct digital pressure on the dorsal side of the base of the proximal phalanx, and push the proximal phalanx in a volar direction to reposition the proximal phalanx above the metacarpal head.

After Reduction

The joint will slide into a flexed position once the dislocation has been reduced. The patient is allowed to use the finger, but a splint should be placed on the dorsal surface of the hand (onto the finger) to prevent extension of the MCP joint beyond 0°. The patient should wear the splint until the joint is completely non-tender, usually for 2–3 weeks.

Active and passive range-of-motion exercises should be done for several months to attain full motion in the joint.

Simple Interphalangeal Joint Dislocations

Often the patient presents after the dislocation is reduced. If reduction is required, use the following technique.

Reduction Technique

1. A digital block may be required for pain control.
2. Apply gentle traction to the finger by grasping the finger distal to the affected joint. Gently pull on the finger, and the dislocation should reduce.

After Reduction

The affected joint(s) should be immobilized with a dorsal splint, keeping the joint in 20–30° of flexion for 5–7 days until the tenderness significantly decreases.

The finger then should be buddy-taped for another 2–3 weeks. When the affected joint is completely pain-free, the taping can be stopped.

Joint stiffness may remain for months. The patient should continue range-of-motion exercises until the finger moves normally.

Complex Dislocations

The treatment of a complex dislocation requires operative exploration, the description of which is beyond the scope of this text. Complex dislocations require referral to a hand specialist.

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