

Common Finger Fractures and Dislocations

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Finger fractures and dislocations are commonly seen in the primary care setting. Patients typically present with a deformity, swelling, and bruising with loss of function. Anteroposterior, lateral, and oblique radiography should be performed to identify fractures and distinguish uncomplicated injuries from those requiring referral. Uncomplicated distal phalanx fractures, caused by a crush injury to the end of the finger, require splinting of the distal interphalangeal joint for four to six weeks. Uncomplicated dorsal avulsion fractures (mallet finger) of the distal interphalangeal joint, caused by forced flexion against resistance, require strict splint immobilization for eight weeks. Flexor digitorum profundus fractures are caused by forceful extension of the distal interphalangeal joint when in a flexed position, resulting in an avulsion fracture at the volar base of the distal phalanx, and usually require surgery. Uncomplicated middle and proximal phalanx fractures, typically caused by a direct blow, can be treated with buddy splinting if there is minimal angulation (less than 10 degrees); however, larger angulations, displacement, and malrotation often require reduction or surgery. Dorsal proximal interphalangeal joint dislocations require reduction and buddy splinting in slight flexion with an extension-block splint. Volar proximal interphalangeal joint dislocations require reduction and splinting in full extension for four to six weeks. Distal interphalangeal joint dislocations require reduction and splinting in full extension (for volar dislocations) or 15 to 30 degrees of flexion (for dorsal dislocations) for two to three weeks. Dorsal metacarpophalangeal joint dislocations are managed with reduction and splinting, but referral to an orthopedic specialist is required if the dislocation is not easily reduced. Volar metacarpophalangeal dislocations are rare and warrant referral. (Am Fam Physician. 2022;105(6):631-639. Copyright © 2022 American Academy of Family Physicians.)

Finger fractures and dislocations are commonly seen in the primary care setting, and finger fractures are the most common type of fracture in sports.¹ Patients often present with a deformity, swelling, and bruising with loss of function. Radiography can identify fractures and distinguish uncomplicated injuries that can be managed by a primary care physician. Appropriate management strategies help the patient return to normal function while minimizing complications.

Fractures

To evaluate suspected finger fractures, anteroposterior, lateral, and oblique radiography should be performed.² Primary care physicians can manage most nondisplaced, well-approximated fractures

with simple immobilization. Diagnosis and management recommendations for finger fractures are outlined in *Table 1*. The recommendations for fractures in this article apply to adolescent and adult patients without evidence of open growth plates on plain radiography and do not apply to children.

DISTAL PHALANX

Distal phalanx fractures are typically the result of a crush or axial load injury (i.e., direct force to the end of the finger). Physical examination usually shows swelling, bruising, or a subungual hematoma. Radiography demonstrates the location and degree of the bony injury.

It is important to assess the patient's ability to fully flex and extend the distal interphalangeal (DIP) joint. Distal sensation should also be evaluated. The inability to flex or extend the joint, loss of distal sensation, and complex fractures warrant evaluation by an orthopedic specialist.

In the absence of these concerns, splinting the DIP joint in full extension for four to six weeks is

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SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	Comments
To evaluate suspected finger fracture or dislocation, anteroposterior, lateral, and oblique radiography should be performed. ^{2,14}	C	Consensus of expert opinion
In the absence of indications for referral, mallet finger (with or without an avulsion fracture) can be effectively treated with strict immobilization. ⁸ The distal interphalangeal joint should be splinted in full extension to slight hyperextension for 8 weeks. ^{9,10} An aluminum padded splint, a volar splint, or a thermoplastic stack splint can be used. ¹¹	B	Cohort trials with similar clinical outcomes
Examination of a patient with a suspected middle or proximal phalanx fracture should include evaluation for malrotation, with referral for surgery if present. ¹⁴⁻¹⁶	C	Primarily expert opinion in clinical reviews
Protected early motion (within 1 week as allowed by pain and swelling) is encouraged after dorsal dislocations of the proximal interphalangeal joint. ²	C	Primarily expert opinion and positive trends found in clinical outcomes of reports (case series, smaller randomized controlled trials)

A = consistent, good-quality patient-oriented evidence; **B** = inconsistent or limited-quality patient-oriented evidence; **C** = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <https://www.aafp.org/afpsort>.

usually sufficient.³ Large (greater than 50% of the nail surface) or painful subungual hematomas benefit from drainage through the nail using a sterile bore or a heat or cautery instrument.⁴

DORSAL AVULSION FRACTURE OR EXTENSOR TENDON RUPTURE (MALLET FINGER)

Mallet finger occurs when the DIP joint is forced to flex against resistance (*Figure 1*).⁵ This can cause avulsion of the extensor tendon from its attachment at the dorsal base of the distal phalanx, with or without avulsion of a bone fragment at the end of the tendon.⁶ Absence of a bony avulsion indicates a pure tendon rupture.

Patients with mallet finger have swelling, bruising, pain, and the inability to actively extend the DIP joint, which is typically slightly flexed due to the unopposed flexor tendon. Radiography is needed to evaluate intra-articular involvement because injuries involving greater than one-third of the joint surface require referral for possible surgical repair. Injuries in which the joint cannot be passively extended require referral to an orthopedic specialist.⁷

In the absence of indications for referral, mallet finger (with or without an avulsion fracture) can be effectively treated with strict immobilization.⁸ The DIP joint should be splinted in full extension to slight hyperextension for eight

weeks.^{9,10} A dorsally padded aluminum splint, a volar splint, or a thermoplastic stack splint can be used.¹¹ It is important to adhere to the immobilization period because premature flexion of the DIP joint can disrupt the healing process and require an additional eight weeks of hyperextension from the time of premature flexion.

FLEXOR DIGITORUM PROFUNDUS AVULSION FRACTURE

A flexor digitorum profundus avulsion fracture (jersey finger) is typically caused by forceful extension of the DIP joint when in a flexed position (*Figure 2*).⁵ This forceful extension leads to an avulsion fracture at the site where the flexor digitorum profundus tendon attaches to the volar base of the distal phalanx.⁵ Although flexor digitorum profundus avulsion fractures can occur in any finger, they most commonly affect the ring finger.

The examination usually reveals swelling, volar-sided pain, and a slightly extended finger when at rest, and patients are usually unable to actively flex the DIP joint.¹² These findings alone (regardless of radiography results) require expedited referral to an orthopedic specialist because flexor digitorum profundus avulsion fractures can benefit from surgery within seven to 10 days.

Radiography is needed to identify intra-articular involvement. A visible bone fragment

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also warrants referral because some injuries require surgical fixation.¹³ When referring a patient to a specialist, the affected finger may be splinted with the proximal interphalangeal (PIP) and DIP joints in slight flexion.

MIDDLE OR PROXIMAL PHALANX

Middle or proximal phalanx fractures are typically due to a direct blow or an axial load injury. Examination reveals swelling, bruising,

tenderness, and occasionally deformity. Clinicians should evaluate for malrotation by having the patient attempt to make a fist. If a phalanx is malrotated, there will be an overlap deformity when flexing the affected digit into a fist (*Figure 3*¹⁴). Comparison to the uninjured hand can be helpful. If malrotation is present, referral for surgery is indicated.¹⁴⁻¹⁶

Radiography is needed to detect oblique, spiral, displaced, or rotational fractures that may

TABLE 1

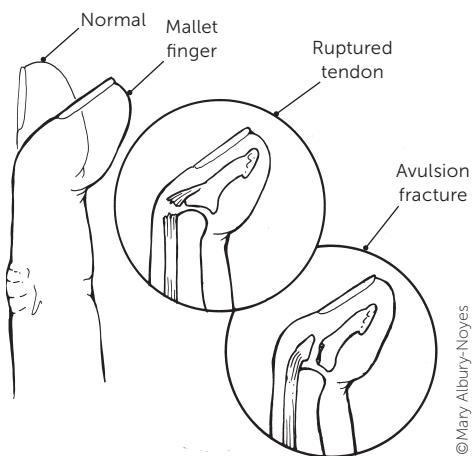
Diagnosis and Treatment of Finger Fractures

Type of fracture	History/evaluation	Management	Follow-up	Indications for referral	Common complications
Distal phalanx fracture	Common in crush or axial load injuries Swelling, deformity, or subungual hematoma may be noted Radiography	Splint with DIP joint in full extension for 4 to 6 weeks U-shaped padded aluminum splint, fingertip guard, or volar splint	Every 2 weeks May take 4 to 6 weeks to heal	Open fracture (consider with subungual hematoma) Angulated or difficult-to-reduce transverse fractures Nonunion Inability to flex or extend the DIP joint or loss of distal sensation	Chronic hyperesthesia or swelling Nonunion
Dorsal avulsion fracture or extensor tendon rupture (mallet finger)	Axial load injury while DIP joint is in extension (forceful flexion) Slight flexion at rest may be noted Radiography	Splint with DIP joint in full extension to slight hyperextension for 8 weeks Premature joint flexion can prolong recovery Dorsally padded aluminum splint, volar splint, or thermoplastic stack splint	Every 2 weeks May take 6 to 10 weeks to heal	> 30% intra-articular involvement Open fracture Inability to passively extend the joint	Extension lag (lack of full extension)
Flexor digitorum profundus avulsion fracture (jersey finger)	Injury caused by forceful extension of the DIP joint when in a flexed position Radiography	Expedited referral for surgery (may splint with proximal interphalangeal and DIP joints in slight flexion until surgery evaluation) DIP joint may be in slight extension at rest	Recovery may take 6 to 12 weeks Extensive hand therapy	All flexor digitorum profundus avulsion fractures require referral for surgery	Contractures of the flexor digitorum profundus (flexion deformities)
Middle or proximal phalanx fracture	Direct blow or axial load injury Evaluation for malrotation Radiography	Reduce if indicated Buddy taping for 3 to 4 weeks if minimally angulated Ulnar or radial gutter splint if fracture had to be reduced (<i>Figure 5</i>); perform postreduction radiography in splint	Repeat radiography in 7 to 10 days to evaluate for alignment Follow-up every 2 weeks May take 4 to 6 weeks to heal	Open fracture Intra-articular, oblique, spiral, and rotational fractures Malrotation	Malunion (includes malrotation and rotation) Nonunion

DIP = distal interphalangeal.

not have been detected on examination and to determine if a fracture is intra- or extra-articular. Intra-articular, oblique, spiral, and rotational fractures typically require referral for surgery.¹⁴

FIGURE 1



© Mary Albury-Noyes

Injury to the joint extensor tendon at the distal interphalangeal joint (mallet finger).

Illustration by Mary Albury-Noyes

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FIGURE 2



Flexor digitorum profundus tendon injury (jersey finger). Note that the injured finger is held in forced extension.

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Minimally angulated (less than 10 degrees) extra-articular fractures without indications for referral can be managed in the primary care setting. Stabilization is achieved by buddy taping the fractured phalanx to the adjacent finger for three to four weeks, based on the return of comfortable function¹⁵ (Figure 4⁵). Taping between the PIP and metacarpophalangeal (MCP) joints serves as a dynamic splint that allows free movement and prevents tendinous complications.

More severely angulated and displaced fractures can also be managed in primary care settings if the clinician is comfortable performing the reduction procedure. Reduction involves applying traction on the distal portion of the phalanx and guiding the bone back into place. Reduction commonly requires oral analgesics or a digital or hematoma block. Postreduction radiography should be performed to confirm successful realignment. Reduced fractures have a higher risk of becoming displaced or angulated during the healing process and therefore require immobilization with an ulnar or radial gutter splint, depending on the affected digit (Figure 5¹⁷).

Dislocations

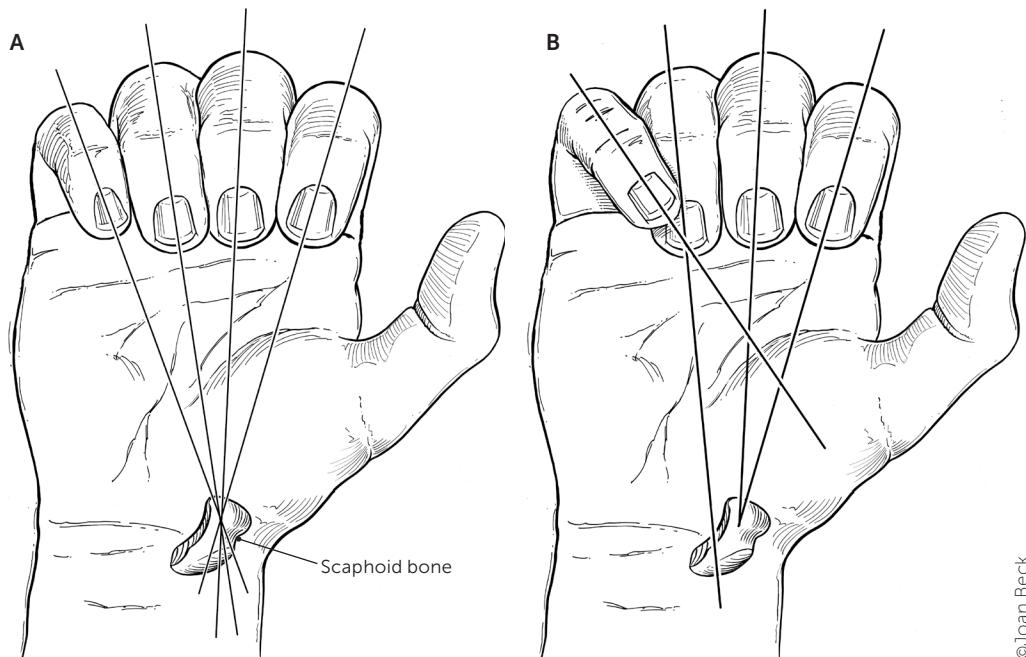
Finger joint dislocations are usually hyperextension injuries caused by an object striking the finger. Examination usually reveals significant tenderness, especially around the volar surface of the joint, edema, and ecchymoses. Anteroposterior, lateral, and oblique radiography is performed for the initial assessment of the injury and postreduction.^{2,14} Dislocations are described by the positioning of the distal phalanx relative to the proximal phalanx. Diagnosis and management recommendations for dislocations are outlined in Table 2.

PIP JOINT: DORSAL

Finger dislocations usually involve the PIP joint, and dorsal (hyperextension) dislocations are most common. A specific injury in a dorsal dislocation is damage to the volar plate, a thick ligamentous structure on the palmar or volar surface of the PIP joint. Hyperextension can tear the volar plate, or tension applied to the volar plate can cause fracturing of the middle phalanx's proximal volar lip.¹⁴ If untreated, the volar plate shortens and thickens, resulting in a flexion deformity of the PIP joint.¹⁸

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FIGURE 3



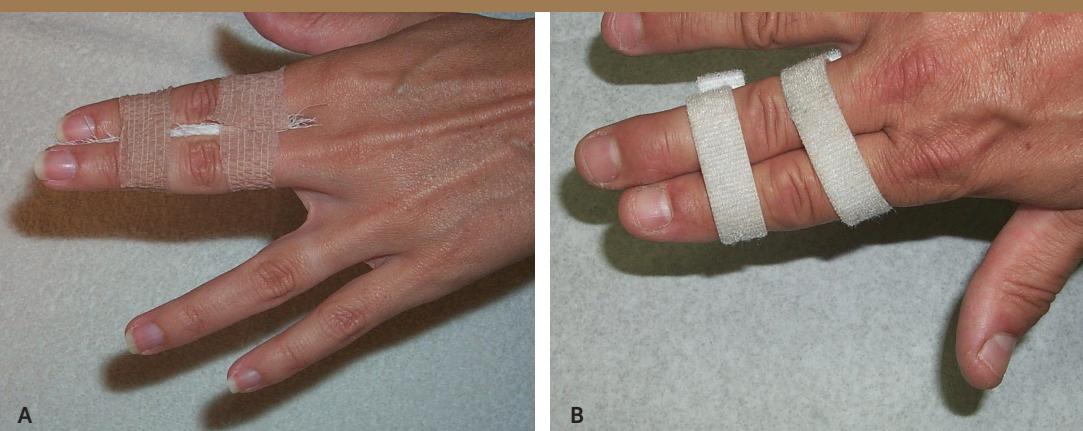
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Detecting rotation in middle phalanx fractures. If no rotation is present, all fingertips will be on the same plane and pointing toward the scaphoid bone. (A) No rotation. (B) Rotation.

Illustration by Joan Beck

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FIGURE 4



Buddy taping for the treatment of finger injuries. (A) Self-adhesive wrap. (B) Velcro wrap.

Reprinted with permission from Leggit JC, Meko CJ. Acute finger injuries: part I. Tendons and ligaments. Am Fam Physician. 2006;73(5):815.

FIGURE 5

Ulnar gutter splint with postreduction casting for fourth or fifth phalangeal fractures. The metacarpophalangeal joint should be flexed at 70 to 90 degrees with the proximal interphalangeal joint flexed at 20 to 30 degrees. Patients typically require 4 weeks of casting.

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Reduction of a dorsal PIP joint dislocation involves firmly grasping the middle and proximal phalanges while applying gentle traction across the joint (Figure 6¹⁹). The PIP joint is hyperextended to reapproximate the articular surface and then slowly flexed to the anatomic position. The volar plate should be palpated to ensure no tenderness is present. If a volar plate injury is suspected, splinting is recommended for four to six weeks, then advancing motion as tolerated.

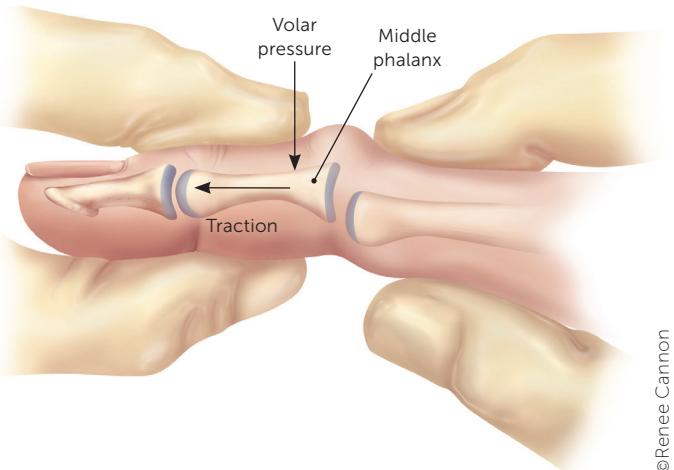
After successful reduction and radiographic confirmation, the PIP joint should be buddy taped to an adjacent finger. Dorsal dislocations should be treated using an extension-block splint, with the finger slightly flexed at 20 to 30 degrees for two to three weeks (Figure 7¹⁷), then progressive flexion as tolerated. Protected early motion (within one

TABLE 2

Diagnosis and Treatment of Finger Dislocations

Joint involved	History/evaluation	Management	Follow-up	Indications for referral	Common complications
Distal interphalangeal	Crush injury (usually an object hits the finger causing hyperextension or hyperflexion) Evaluation for tenderness of the dorsal or volar surface Radiography	Reduce and use dorsal extension-block splint for 2 to 3 weeks	2 to 3 weeks Start range-of-motion exercise program if no complications	Open wound Dislocation > 3 weeks old or unable to reduce Fracture involving > 30% intra-articular surface	Extensor or flexor tendon rupture Swan neck deformity Chronic hyperesthesia or edema Recurrent instability
Proximal interphalangeal	Direct blow causing hyperextension injury and usually dorsal dislocation Radiography Evaluation for central slip disruption Evaluation for tenderness of the volar plate	Reduce and buddy tape for 3 to 6 weeks Dorsal: extension-block splint at 20 to 30 degrees of flexion for 2 to 3 weeks Volar: dorsal splint in full extension for 4 to 6 weeks	Every 2 to 4 weeks depending on severity May take up to 12 to 18 months to heal	Open wound Irreducible Avulsion fracture involving > 30% intra-articular surface, complex fractures Medial or lateral dislocations	Stiffness or loss of function Boutonniere deformity (volar) Volar plate laxity or hyperextension deformity Recurrent instability
Metacarpophalangeal (excluding thumb)	Direct blow causing hyperextension injury and usually dorsal dislocation Radiography	Reduce and splint Dorsal: dorsal extension-block splint at 30 to 60 degrees of flexion for 7 to 10 days Lateral: dorsal extension-block splint flexed at 30 to 60 degrees for 3 weeks	Every 2 to 3 weeks until functional	Open dislocation Irreducible or complex Volar dislocation or significant lateral dislocations Avulsion fractures involving > 20% of the joint surface or > 2 mm displacement	Stiffness or loss of function Recurrent instability

FIGURE 6



Reduction technique for proximal interphalangeal joint dislocations. Apply distal traction on the injured finger while applying volarly directed pressure to the middle phalanx. Hold the proximal phalanx in place while applying counterpressure.

Illustration by Renee Cannon

Reprinted with permission from Borchers JR, Best TM. Common finger fractures and dislocations. *Am Fam Physician*. 2012;85(8):807.

week as allowed by pain and swelling) is encouraged after dorsal dislocations of the PIP joint.²

PIP JOINT: VOLAR

The volar plate is usually preserved in volar dislocations, but there is often a disruption in a portion of the dorsally located extensor tendon (referred to as the central slip).¹⁶ Injury to the central slip weakens the ability of the PIP joint to extend, but sparing of the lateral band extensor tendons allows for the extension of the DIP joint. If untreated, a central slip injury can result in a boutonniere deformity (Figure 8).⁵

Volar dislocations are reduced in the same way as dorsal dislocations.²⁰ Once reduction is performed, evaluation for a central slip disruption should be done by placing the PIP joint at 90 degrees on the edge of a table and asking the patient to extend the joint against resistance²¹ (Figure 9). A positive result includes successful extension of the DIP joint but the inability to extend the PIP joint.

Volar dislocations with suspected central slip disruption should be splinted in full extension

for at least four to six weeks. As soon as tolerated, active flexion and extension range-of-motion exercises of the DIP and MCP joints are encouraged while the PIP joint is splinted.²⁰ Patients should be warned that even with optimal treatment, edema may be permanent, and pain can persist for more than one year.

DIP JOINT

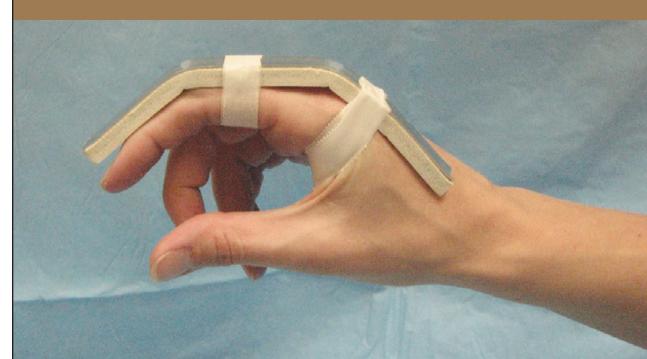
DIP joint dislocations are less common and are usually due to a crush injury in which an object (e.g., baseball) hits the finger, causing the DIP joint to hyperextend or hyperflex. Radiography is needed to determine whether a concomitant fracture is present.

Reduction of a dorsal DIP joint dislocation involves applying gentle traction, hyperextending the DIP joint, and then returning the joint to the correct anatomic position. If there is a wound (usually present over the volar surface), it is considered an open dislocation and should be treated surgically to avoid infection. Additional surgical

indications include the inability to reduce the injury, prolonged dislocation, or persistent instability despite relocation.¹⁵

If there is no fracture, the DIP joint should be splinted in full extension (for volar dislocations)

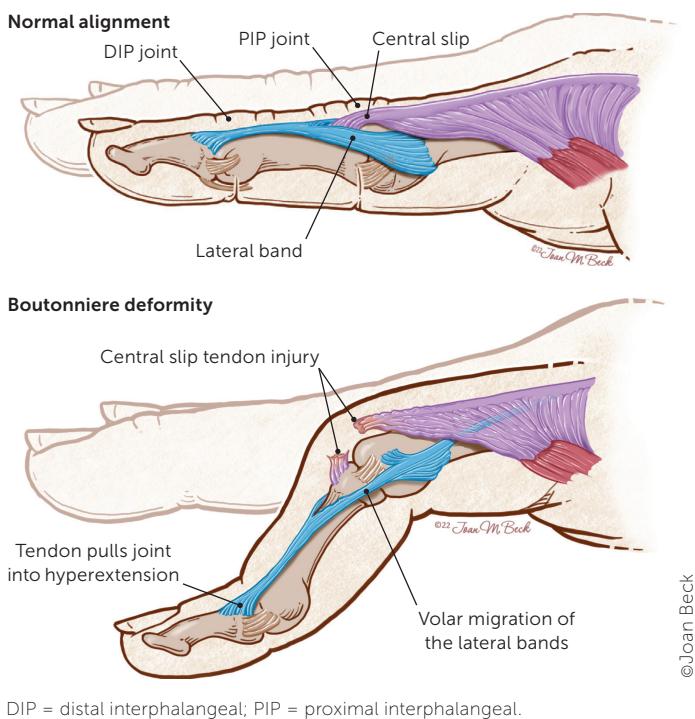
FIGURE 7



Dorsal extension-block splint.

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FIGURE 8



DIP = distal interphalangeal; PIP = proximal interphalangeal.

Boutonniere deformity from a central slip extensor tendon injury.

Illustration by Joan Beck

Adapted with permission from Leggit JC, Meko CJ. Acute finger injuries: part I. Tendons and ligaments. *Am Fam Physician*. 2006;73(5):815.

FIGURE 9



Evaluation for central slip disruption. The proximal interphalangeal joint is placed at 90 degrees and extended against resistance. A positive result is successful extension of the distal interphalangeal joint but not the proximal interphalangeal joint.

or 15 to 30 degrees of flexion (for dorsal dislocations) for two to three weeks, depending on patient comfort, followed by an active range-of-motion exercise program.

MCP JOINT

This section discusses MCP joint dislocations of the digits, excluding the thumb. MCP dislocations are usually due to a direct blow, causing hyperextension injury. The MCP joint can be dislocated in the dorsal (most common), volar, or lateral plane.² Similar to the PIP joint, dorsal MCP joint dislocations can cause volar plate injuries. MCP joint dislocations are further divided into simple vs. complex dislocations, which can be determined using radiography.

Simple dislocations maintain some contact between the two articular surfaces of the MCP joint. However, complex dislocations show no continuity between the joint surfaces and can involve sesamoids or relocation of other soft tissues within the joint, making closed reduction difficult.

Simple dorsal dislocations are managed immediately with reduction and a dorsal extension-block splint set at 30 to 60 degrees of flexion for seven to 10 days, then transitioned to buddy taping and early range of motion.²² Patients with dorsal dislocations that cannot be easily reduced or have characteristics of a complex injury on plain radiography should be referred immediately to an orthopedic specialist. Volar dislocations of the MCP joint are rare and require referral to an orthopedic specialist.

Simple lateral dislocations can be managed with a dorsal extension-block splint set at 30 to 60 degrees of flexion for three weeks, followed by buddy taping for another two to three weeks. Lateral dislocations that occurred more than two weeks previously and involve greater than 20% of the joint surface or are displaced by greater than 2 mm warrant referral to an orthopedic specialist. Lateral dislocations may also result in injury to or instability of the radial collateral ligament because they usually tilt toward the ulna and should prompt surgical evaluation.

This article updates a previous article on this topic by Borchers and Best.¹⁹

Data Sources: A PubMed search was completed in Clinical Queries using the key terms finger, fracture, and dislocation. The search included meta-analyses, randomized controlled trials, clinical trials, and reviews. Also searched were the Agency for Healthcare Research and Quality evidence reports, Clinical Evidence, the Cochrane database, Essential Evidence Plus, the Institute for Clinical Systems Improvement, and DynaMed. Search dates: April 14, 2021, and March 8, 2022.

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