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*The authors reported no
potential conflict of interest
relevant to this article.*

doi: 10.12788/ffp.0425

Tips for managing 4 common soft-tissue finger and thumb injuries

After examination and, in some cases, imaging, most of these injuries can be managed conservatively with splinting or injection. Some cases require prompt surgical referral.

PRACTICE RECOMMENDATIONS

› *Treat trigger finger with a corticosteroid injection into the flexor tendon sheath. (A)*

› *Refer a case of jersey finger to a hand surgeon within 1 week after injury for flexor tendon repair. (C)*

› *Treat mallet finger with strict distal interphalangeal joint immobilization for 6 to 8 weeks. (A)*

› *Treat Grades 1 and 2 skier's thumb with immobilization in a thumb spica splint or a cast for 4 to 6 weeks. (B)*

Strength of recommendation (SOR)

- (A)** Good-quality patient-oriented evidence
- (B)** Inconsistent or limited-quality patient-oriented evidence
- (C)** Consensus, usual practice, opinion, disease-oriented evidence, case series

Finger injuries are often seen in the primary care physician's office. The evidence—and our experience in sports medicine—indicates that many of these injuries can be managed conservatively with bracing or injection; a subset, however, requires surgical referral. In this article, we provide a refresher on finger anatomy (see “A guide to the anatomic structures of the digits of the hand,”^{1,2} page 212) and review the diagnosis and management of 4 common soft-tissue finger and thumb injuries in adults: trigger finger, jersey finger, mallet finger, and skier's thumb (TABLE²⁻¹⁸).

Trigger finger

Also called *stenosing flexor tenosynovitis*, trigger finger is caused by abnormal flexor tendon movement that results from impingement at the level of the A1 pulley.

Causes and incidence. Impingement usually occurs because of thickening of the A1 pulley but can also be caused by inflammation or a nodule on the flexor tendon.^{3,4} The A1 pulley at the metacarpal head is the most proximal part of the retinacular sheath and therefore experiences the greatest force upon finger flexion, making it the most common site of inflammation and constriction.⁴

Trigger finger occurs in 2% to 3% of the general population and in as many as 10% of people with diabetes.⁵ The condition typically affects the long and ring fingers of the dominant hand; most cases occur in women in the sixth and seventh decades.³⁻⁵

Multiple systemic conditions predispose to trigger finger, including endocrine disorders (eg, diabetes, hypothyroidism), inflammatory arthropathies (gout, pseudogout), and autoimmune disorders (rheumatoid arthritis, sarcoidosis).^{3,5} Diabetes



Trigger finger occurs in 2% to 3% of the general population and in as many as 10% of people with diabetes.

(Left to right: Jersey finger, trigger finger, mallet finger.)

commonly causes bilateral hand and multiple digit involvement, as well as more severe disease.^{3,5} Occupation is also a risk factor for trigger finger because repetitive movements and manual work can exacerbate triggering.⁴

■ Presentation and exam. Patients report pain at the metacarpal head or metacarpophalangeal (MCP) joint, difficulty grasping objects, and, possibly, clicking and catching of the digit and locking of the digit in flexion.^{3,5}

On exam, there might be tenderness at the level of the A1 pulley over the volar MCP joint or a palpable nodule. In severe cases, the proximal interphalangeal (PIP) joint or entire finger can be fixed in flexion.⁵ Repeated compound finger flexion (eg, closing and opening a fist) or holding a fist for as long as 1 minute and then slowly opening it might provoke triggering.

More than 60% of patients with trigger finger also have carpal tunnel syndrome.⁵ This makes it important to assess for (1) sensory changes in the distribution of the median nerve and (2) nerve compression, by eliciting Phalen and Tinel signs.^{4,5}

■ Imaging. Trigger finger is a clinical diagnosis. Imaging is therefore unnecessary for diagnosis or treatment.⁵

■ Treatment. Trigger finger resolves spontaneously in 52% of cases.³ Most patients experience relief in 8 to 12 months.³

First-line treatment is injection of a corticosteroid into the flexor tendon sheath, which often alleviates symptoms.^{4,5} Injection is performed at the level of the A1 pulley on the palmar surface, just proximal to the MCP joint at the level of the distal palmar crease⁶ (FIGURE 1). The needle is inserted at an oblique angle until there is an increase in resistance. The needle is then slightly withdrawn to reposition it in the tendon sheath; 0.5 to 1 mL of 50% corticosteroid and 50% local anesthetic without epinephrine is then injected.⁶

The cure rate of trigger finger is 57% to 70% with 1 injection and 82% to 86% after 2 injections.^{3,4,19}

Many patients experience symptom relief in 1 to 4 weeks after a corticosteroid injection; however, as many as 56% experience repeat triggering within 6 months—often making multiple injections (maximum, 3 per digit) necessary.^{19,20} Patients who have a longer duration of symptoms, more severe symptoms, and multiple trigger fingers are less likely to experience relief with injections.^{3,5}

Splinting is an effective treatment for patients who cannot undergo corticosteroid

IMAGE: BRIAN STAUFER

TABLE

4 finger and thumb soft-tissue injuries: What you'll see, how you'll treat²⁻¹⁸

Injury	Definition and anatomy	Pathophysiology	Presentation	Exam and pertinent tests	Imaging	Management
Trigger finger	Impingement of the flexor tendon at the level of the A1 pulley ^{3,4}	Thickening of the A1 pulley or a nodule on the flexor tendon causes the tendon to catch on the A1 pulley ^{3,4}	Pain over the volar MCP joint Presence of clicking, catching, or locking of the affected digit ^{3,5}	Pain, nodule, or both, at the volar MCP joint Repeated finger flexion or slowly opening clenched fist can provoke triggering ⁵	Radiographs are not necessary for diagnosis If ordered, they will be negative for pathology	Corticosteroid injection into the flexor tendon sheath ^{4,5} Consider splinting if the patient is a poor candidate for injection ^{3,7} Refer for surgery if no improvement is seen after 2 or 3 injections ⁴
Jersey finger	Avulsion of the flexor digitorum profundus tendon from the distal phalanx ^{8,9}	Flexed finger is forced into extension, as can occur during a tackle ^{9,10} Ring finger is commonly affected ^{8,9}	Inability to actively flex the DIP joint ^{8,9}	Affected finger might lie in extension DIP joint can be passively (but not actively) flexed Might have tenderness over the distal phalanx ^{8,9}	Radiographs might show avulsion fragment from the dorsal base of the distal phalanx ^{9,11}	Refer for surgery ⁹
Mallet finger	Disruption of the extensor tendon due to injury or laceration of the tendon ^{6,14}	Usually due to a forced flexion or hyperextension injury Can occur after laceration of the dorsal surface of the finger ^{12,15}	Pain and swelling at the DIP joint Inability to actively extend the DIP joint ^{6,12}	DIP joint is flexed and can be passively (but not actively) extended ^{12,13}	Radiographs might show fracture at the dorsal base of the distal phalanx if the injury is due to hyperextension ¹²	6-8 wk of splinting the DIP joint in extension; splint must be worn continuously ¹² Refer for surgery if there is subluxation of the distal phalanx or a fracture greater than one-third of the articular surface, or the flexor tendon is lacerated ^{12,14}
Skier's thumb	Tear of the thumb UCL at the MCP joint ¹⁶	Valgus force hyperabducts the thumb ¹⁶	Swelling and pain at the MCP joint Weakness of grip or pinch ^{2,16,18}	Stress exam of the thumb UCL reveals laxity or a soft endpoint, or both; a firm endpoint is found in Grade 2 injury ^a Stener lesion ^b might be palpable if the tear is Grade 3 ^{c,2,16}	Order radiographs to evaluate for subluxation of the proximal phalanx ^{16,17} Order magnetic resonance imaging if the stress exam is equivocal ^{2,18}	<i>Grades 1^d and 2^a injuries:</i> Manage with a thumb spica splint for 4-6 wk ^{16,18} <i>Grade 3^c:</i> Refer for surgery ¹⁶

DIP, distal interphalangeal; MCP, metacarpophalangeal; UCL, ulnar collateral ligament.

^a Partial tear marked by laxity on the stress exam, with a firm endpoint.

^b Palpable mass over the ulnar side of the MCP joint.

^c Complete tear showing laxity and a soft endpoint on a stress exam.

^d Partial tear characterized by pain upon palpation but no instability on the stress exam.

injection or surgery. The MCP or PIP joint is immobilized in extension while movement of the distal interphalangeal (DIP) joint is maintained. Instruct the patient that the splint must be worn day and night; splinting is continued for ≥ 6 weeks.²¹ Splinting relieves symptoms in 47% to 70% of cases and is most effective in patients whose symptoms have been present for < 6 months.^{3,7}

Patients whose trigger finger is locked in flexion and those who have not experienced improvement after 2 or 3 corticosteroid injections should be referred for surgery.⁴ The surgical cure rate is nearly 100%; only 6% of patients experience repeat triggering 6 to 12 months postoperatively.^{4,7,22}

Jersey finger

Causes and incidence. Jersey finger is caused by avulsion injury to the flexor digitorum profundus (FDP) tendon at its insertion on the distal phalanx.^{8,9} It occurs when a flexed finger is forced into extension, such as when a football or rugby player grabs another player's jersey during a tackle.^{9,10} This action causes the FDP tendon to detach from the distal phalanx, sometimes with a bony fragment.^{9,11} Once detached, the tendon might retract proximally within the finger or to the palm, with consequent loss of its blood supply.⁹

Although jersey finger is not as common as the other conditions discussed in this article,⁹ it is important not to miss this diagnosis because of the risk of chronic disability when it is not treated promptly. Seventy-five percent of cases occur in the ring finger, which is more susceptible to injury because it extends past the other digits in a power grip.^{8,9}

Presentation and exam. On exam, the affected finger lies in slight extension compared to the other digits; the patient is unable to actively flex the DIP joint.^{8,9} There may be tenderness to palpation over the volar distal phalanx. The retracted FDP tendon might be palpable more proximally in the digit.

Imaging. Anteroposterior (AP), oblique, and lateral radiographs, although unnecessary for diagnosis, are recommended to assess for an avulsion fragment, associated

FIGURE 1
Trigger finger injection technique



IMAGES COURTESY OF CATHLIN A. NICHOLSON, MD, AND JEREMY A. ALLAND, MD

Insert the needle at an oblique angle just proximal to the metacarpophalangeal joint at the level of the distal palmar crease. Advance the needle until an increase in resistance is felt. Withdraw the needle slightly and inject 0.5 to 1 mL of 50% corticosteroid and 50% local anesthetic into the tendon sheath.

fracture, or dislocation.^{9,11} Ultrasonography or magnetic resonance imaging is useful in chronic cases to quantify the degree of tendon retraction.⁹

Treatment. Refer acute cases of jersey finger for surgical management urgently because most cases require flexor tendon repair within 1 or 2 weeks for a successful outcome.⁹ Chronic jersey finger, in which injury occurred > 6 weeks before presentation, also

FIGURE 2

Volar-based splint for mallet finger



IMAGES COURTESY OF CAITLIN A. NICHOLSON, MD, AND JEREMY A. ALLAND, MD

Splinting is the first-line treatment for almost all mallet finger injuries that are not the result of a laceration or crush injury. The splint must be worn continuously for 6 to 8 weeks, even when the patient is performing daily hygiene.

requires surgical repair, although not as urgently.⁹

■ **Complications** of jersey finger include flexion contracture at the DIP joint and the so-called *quadriga effect*, in which the patient is unable to fully flex the fingers adjacent to the injured digit.⁸ These complications can cause chronic disability in the affected hand, making early diagnosis and referral key to successful treatment.⁹

Mallet finger

Also called *drop finger*, mallet finger is a result of loss of active extension at the DIP joint.^{12,13}

■ **Causes and incidence.** Mallet finger is a relatively common injury that typically affects the long, ring, or small finger of the dominant hand in young to middle-aged men and older women.^{12,14,23} The condition is the result of forced flexion or hyperextension injury, which disrupts the extensor tendon.^{6,14}

Sudden forced flexion of an extended DIP joint during work or sports (eg, catching a ball) is the most common mechanism of injury.^{12,15} This action causes stretching or tearing of the extensor tendon as well as a possible avulsion fracture of the distal phalanx.¹³ Mallet finger can also result from a laceration or crush injury of the extensor tendon (open mallet finger) or hyperextension of the DIP joint, causing a fracture at the dorsal base of the distal phalanx.¹²

■ **Presentation.** Through any of the aforementioned mechanisms, the delicate balance between the flexor and extensor tendons is disrupted, causing the patient to present with a flexed DIP joint that can be passively, but not actively, extended.^{6,12} The DIP joint might also be painful and swollen. Patients whose injury occurred > 4 weeks prior to presentation (chronic mallet finger) might also have a so-called *swan-neck deformity*, with hyperextension of the PIP joint in the affected finger.¹²

■ **Imaging.** AP, oblique, and lateral radiographs are recommended to assess for bony injury.

■ **Treatment.** Splinting is the first-line treatment for almost all mallet finger injuries that are not the result of a laceration or crush injury. Immobilize the DIP joint in extension for 6 to 8 weeks, with an additional 2 to 4 weeks of splinting at night.^{6,12} The splint must be worn continuously in the initial 6 to 8 weeks, and the DIP joint should remain in extension—even when the patient is performing daily hygiene.¹² It is imperative that patients comply with that period of continuous immobilization; if the DIP joint is allowed to flex, the course of treatment must be restarted.¹³

Many different types of splints exist; functional outcomes are equivalent across all of them.^{24,25} In our practice, we manage mal-

let finger with a volar-based splint (FIGURE 2), which is associated with fewer dermatologic complications and has provided the most success for our patients.²³

Surgical repair of mallet finger injury is indicated in any of these situations^{12,14}:

- injury is caused by laceration
- there is volar subluxation of the DIP joint
- more than one-third of the articular surface is involved in an avulsion fracture.

Patients who cannot comply with wearing a splint 24 hours per day or whose occupation precludes wearing a splint at all (eg, surgeons, dentists, musicians) are also surgical candidates.¹²

Surgical and conservative treatments have similar clinical and functional outcomes, including loss of approximately 5° to 7° of active extension and an increased risk of DIP joint osteoarthritis.^{12,14,24} Patients with chronic mallet finger can be managed with 6 weeks of splinting initially but will likely require surgery.^{6,12,13}

Skier's thumb

This relatively common injury is a tear of the ulnar collateral ligament (UCL) at the MCP joint of the thumb.¹⁶

■ **Causes and incidence.** Skier's thumb occurs when a valgus force hyperabducts the thumb,¹⁶ and is so named because the injury is often seen in recreational skiers who fall while holding a ski pole.¹⁵⁻¹⁷ It can also occur in racquet sports when a ball or racquet strikes the ulnar side of thumb.¹⁶

In chronic cases, the UCL can be injured by occupational demands and is termed *gamekeeper's thumb* because it was first described in this population, who killed game by breaking the animal's neck between the thumb and index finger against the ground.^{16,18} A UCL tear causes instability at the thumb MCP joint, which affects a person's ability to grip and pinch.^{2,16,18}

■ **Presentation.** On exam, the affected thumb is swollen and, possibly, bruised. There might be radial deviation and volar subluxation of the proximal phalanx. The ulnar side of the MCP joint is tender to pal-

FIGURE 3

Stress exam of the thumb ulnar collateral ligament



Stabilize the metacarpal neck and apply valgus force on the proximal phalanx (in the direction of the arrow) to assess for laxity.

pation.¹⁶ If the distal UCL is torn completely, it can displace proximally and present as a palpable mass over the ulnar side of the MCP joint, known as a *Stener lesion*.¹⁶

Stress testing of the MCP joint is the most important part of the physical exam for skier's thumb. Stabilize the metacarpal neck and apply a valgus stress on the proximal phalanx at both 0° and 30° of MCP flexion (FIGURE 3), which allows for assessment of both the proper and accessory bands of the UCL.^{2,16} (A common pitfall during stress testing is to allow the MCP joint to rotate, which can mimic instability.²) Intra-articular local anesthesia might be necessary for this exam because it can be painful.^{16,18,26} A stress exam should assess for laxity and a soft or firm endpoint; the result should be compared to that of a stress exam on the contralateral side.^{16,17}

■ **Imaging.** AP, oblique, and lateral radiographs of the thumb should be obtained to assess for instability, avulsion injury, and associated fracture. Subluxation (volar or radial) or supination of the proximal phalanx relative to the metacarpal on imaging sug-

IMAGE COURTESY OF CATHLIN A. NICHOLSON, MD, AND JEREMY A. ALLAND, MD



Symptoms of trigger finger are pain at the metacarpal head or in the MCP joint, difficulty grasping objects, clicking and catching of the digit, and locking of the digit in flexion.

A guide to the anatomic structures of the digits of the hand

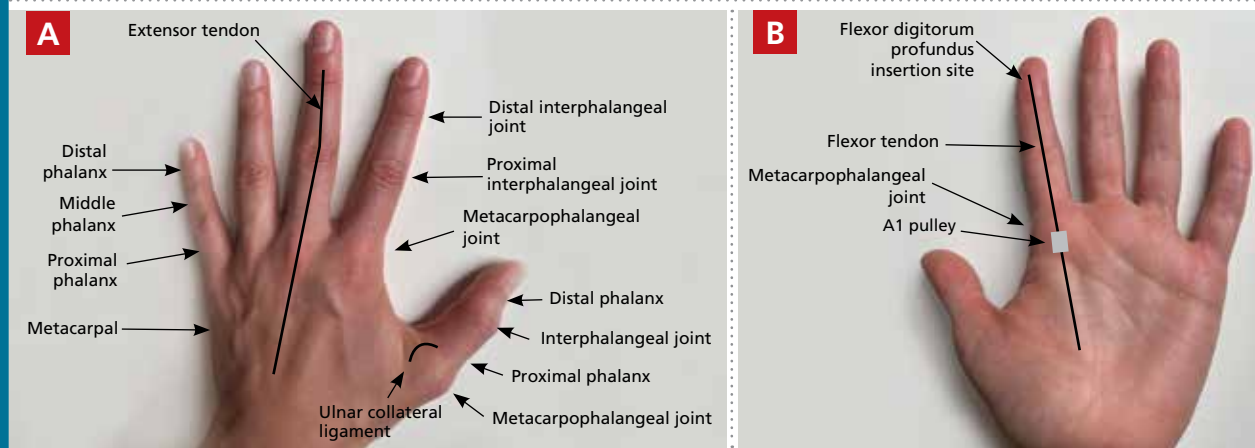
■ **Phalanges.** The fingers are composed of bony phalanges: The second through fifth digits have 3 (proximal, middle, and distal); the thumb has 2 (proximal and distal).¹

■ **Articulations** between the phalanges are described anatomically: The second through fifth digits have proximal interphalangeal joints (PIPs; between the proximal and middle phalanges) and distal interphalangeal joints (DIPs; between the middle and distal phalanges). The thumb has a sole interphalangeal joint. Each proximal phalanx articulates with a metacarpal bone at the metacarpophalangeal (MCP) joint (A).

■ **Ligaments.** The MCP joints of the second through fifth digits are stabilized by cruciate ligaments and collateral ligaments. The thumb MCP joint has no cruciate ligaments; the radial collateral ligament and the ulnar collateral ligament stabilize this joint against varus and valgus forces, respectively² (A). Each of these ligaments has a proper band and an accessory band. The proper band stabilizes the joint at 30° of MCP flexion; the accessory band provides stability at 0° of MCP flexion.²

■ **Tendons.** Extensor tendons run along the dorsal aspect of each finger; flexor tendons run along the volar (palmar) aspect (B). Flexor tendons course through a retinacular sheath comprising 5 annular ligaments (A1-A5, from proximal to distal). These ligaments function as pulleys and guide the tendons along the bony phalanges, facilitating smooth finger flexion.¹

IMAGES COURTESY OF CAITLIN A. NICHOLSON, MD, AND JEREMY A. ALLAND, MD



gests MCP instability of the MCP joint.^{16,17}

If the stress exam is equivocal, magnetic resonance imaging is recommended for further assessment.^{2,18}

Stress radiographs (ie, radiographs of the thumb with valgus stress applied at the MCP joint) can aid in diagnosis but are controversial. Some experts think that these stress views can further damage the UCL; others recommend against them because they carry a false-negative rate $\geq 25\%$.^{15,16} If you choose to perform stress views, order standard radiographs beforehand to rule out bony injury.¹⁷

■ **Treatment.** UCL tears are classified as 3 tiers to guide treatment.

- *Grade 1 injury* (a partial tear) is characterized by pain upon palpation but

no instability on the stress exam.

- *Grade 2 injury* (also a partial tear) is marked by laxity on the stress exam with a firm endpoint.
- *Grade 3 injury* (complete tear) shows laxity and a soft endpoint on a stress exam^{16,17}; Stener lesions are seen only in grade 3 tears.^{16,17}

Grades 1 and 2 UCL tears without fracture or with a nondisplaced avulsion fracture can be managed nonoperatively by immobilizing the thumb in a spica splint or cast for 4 to 6 weeks.^{16,18} The MCP joint is immobilized and the interphalangeal joint is allowed to move freely.^{2,16,17}

Grade 3 injuries should be referred to a

hand specialist for surgical repair.¹⁶ Patients presenting > 12 weeks after acute injury or with a chronic UCL tear should also be referred for surgical repair.¹⁶ **JFP**

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LETTERS

Taking the time to get it right

I cannot agree more with Dr. Hickner's editorial, "The power of the pause to prevent diagnostic error" (*J Fam Pract*. 2022;71:102). In 1974, when I started at the Medical College of Virginia, I thought I was going to be a medical researcher. By mid-1978, I had completely changed my focus to family medicine. Fortunately, my drive for detail and accuracy remained, albeit at odds with a whirlwind residency and solo practice. I drove my staff (and wife) crazy because I frequently spent

more than the "allotted" time with a patient. The time was not wasted; it was most important for me to gain the trust of the patient and then to get it right—or find a path to the answer.

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Don't overlook this cause of falls

I enjoyed reading "How to identify balance disorders and reduce fall risk" (*J Fam Pract*. 2022;71:20-30) from the January/February

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