Hand Injuries in Sports Medicine

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Hand injuries are very common in athletes. Depending on the sport, the percentage of injuries involving the hand and wrist can vary greatly. In inline skating, up to half of all the musculoskeletal injuries are to the hand or wrist, and in football the range is from 15% to 20% [1]. Athletic injuries of the hand and wrist can be categorized by the structures involved, the etiology, and the acuity. This article describes the assessment and management of common bone, ligament, tendon, and neurovascular injuries to the hand in sports medicine. Traumatic and repetitive etiologies, and acute and chronic presentations are discussed.

The objectives of the article are: (1) to describe the more common athletic injuries to the hand, (2) to aid the primary care physician in their proper diagnosis and assessment, and (3) to discuss their management in acute and chronic presentation, including when to refer.

History

As with other musculoskeletal conditions, a good history of the hand or wrist complaint is very helpful in making an accurate assessment of the injury and in its subsequent management. Was the onset acute or chronic, and when did it start? Was there trauma, either at the onset or in the distant past?

If there was a specific acute injury, what was the mechanism? The patient may not recall what the exact wrist or hand position was at the time of injury, but certain activities at the time of injury are important diagnostically (eg, catching a ball, grabbing a jersey, falling on an outstretched hand, falling while downhill skiing, crashing into the boards). Is there swelling, and if so, when did the swelling start?
Inquire about an overuse history—a new sport or job, or a change in frequency, duration, or intensity of existing activities. New changes in equipment in sports or at work, a new grip position, or a new technique may all be significant not only in assessment and management, but also in future prevention. Even if there is no activity specifically related to the complaint, there is often something in a history that is revealing in a biomechanical sense. Is there a new baby in the house, requiring repetitive lifting and causing deQuervain’s tenosynovitis? Was there a recent work or school project that made the patient triple his time spent typing on a keyboard?

What makes the pain worse and what makes the pain better? Have the patient describe certain specific activities or exact positions that exacerbate or alleviate the symptoms. Is there a “click,” “pop,” or “clunk” sensation in the hand or wrist? Is it reproducible by the patient or the examiner? Joints can be unstable in the wrist, and tendons can sublux (extensor carpi ulnaris) or get mechanically trapped (trigger finger).

Have the patient describe the symptoms and then point to or outline where the pain or symptoms are felt. Examine the painful area last, and tell the patient you will do so; helping the patient to relax will only increase the clinical yield of the examination. Does the pain radiate proximally or distally?

The presence of parasthesias, weakness, or pallor could be consistent with neurovascular involvement, whether central or peripheral in nature. Night pain, unexplained fever or chills, or other systemic complaints (rash, polyarthralgias, subcutaneous nodules) may be nonspecific but may be markers of infection, tumor, or other systemic medical disease processes. The complete list of pathologies that can present with hand or wrist pain is too long to be presented here.

Hand dominance should be noted. Occupation, sports, and hobbies are all important; often in sports medicine the decision of when to allow return to play is a critical part of management, because the athlete, with the input of the physician, is trying to return to play as soon as possible, yet as safely as possible. Differences in management for an athlete who is “in season” or “out of season” for certain conditions are described below—for example, in jersey finger injuries.

Age as an indicator of skeletal maturity is also taken into account. In general, open physeal growth plates are subject to injury at lower forces compared with ligaments or mature bone. In the pediatric or adolescent athlete presenting with a “wrist sprain,” a growth plate injury should be at least considered and ruled out by examination, with or without imaging studies.

Anatomy and biomechanics

On initial consideration, reviewing the anatomy appears at best tedious or at worst daunting; however, because of the multiple structures and functions of the hand, there is a lot of potential pathology. Keeping a good
musculoskeletal anatomy reference nearby can be invaluable in the office. What follows is a brief anatomical review of the hand and wrist. The sports medicine maxim of “know your anatomy” definitely holds true in the assessment of hand and wrist injuries.

The radius averages 9 mm longer than the ulna. Ulnar variance refers to the relative length of the ulna with respect to the radius, determined at the carpal surface. Neutral variance occurs when the bones are of equal length, negative variance occurs when the ulna is shorter, and positive variance occurs when the ulna is longer. Ulnar variance affects the distribution of force across the wrist. Increased ulnar negative variance is associated with lunate avascular necrosis, and positive ulnar variance is associated with triangular fibrocartilage complex (TFCC) injuries. Approximately 80% of weight-bearing load across the wrist is through the radial side, and the remaining 20% is transmitted on the ulnar side [2]. The joints of the wrist are the radiocarpal, radioulnar, intercarpals, and carpometacarpals.

There are six dorsal wrist compartments, fibro-osseous tunnels through which travel the extensor tendons of the wrist, hand, and fingers. The three flexors of the wrist are the flexor carpi ulnaris, palmaris longus (congenitally absent in 10% of people), and flexor carpi radialis. The palmaris is not as functionally important, and is sometimes removed to provide a tendon autograft for elsewhere in the body.

Eight carpal bones are in two rows: the proximal row is formed by the scaphoid, lunate, triquetrum, and pisiform; and the distal row consists of the trapezium, trapezoid, capitate, and hamate. The second row articulates distally with the metacarpals. The thumb has two phalanges, and the fingers each have three.

Nine finger-flexor tendons (two for each finger and one for the thumb) run through the carpal tunnel, as does the median nerve. The ulnar nerve and artery pass through Guyon’s canal in the wrist. The landmarks for both are described elsewhere in this article. The blood supply to the hand is via arches formed by collaterals of the ulnar and radial arteries. The median, ulnar, and radial nerves all enervate the hand and wrist, and the central nerve distribution is C6, C7, C8, and T1 for both motor and sensory function. Further relevant anatomy is given in each section below.

The functional demands on the hand and wrist vary greatly among sports and different activities. Most daily activities can be performed with 40° of wrist extension, flexion, and ulnar and radial deviation. The necessary ranges of motion of basketball free throws, baseball pitching, and golf swings have all been studied. Wrist pain in gymnasts is very common, with a greater than 50% incidence rate in some reports [3].

Physical examination

The physical examination of the hand and wrist starts at the neck, moves down to shoulders and elbows, continues to the forearm, and finally moves
to the wrist and hand. The examiner should be familiar with the central and peripheral nerve distribution for sensory and motor function of the upper extremity. Cervical radiculopathy is less likely in an acute traumatic distal upper extremity injury; however, assess the cervical spine active range of motion, cervical spine palpation, and Spurling’s maneuver for neural foramina encroachment, as well as conducting neurovascular assessment of the entire extremity. Fortunately, most patients will have bilateral upper extremities—it is important that both sides are examined and compared.

The principles of musculoskeletal examination remain the same as those learned in medical school: inspection, active and passive range of motion, strength testing, ligament laxity assessment, neurovascular assessment, and careful directed palpation. Special provocative or pathognomic examination tests for certain conditions are given in each section below. Inspect for obvious deformity, swelling, atrophy, masses, or other asymmetry. Note skin changes such as pallor, ecchymoses, lacerations, or abrasions. Active range of motion (AROM) is next: wrist extension, flexion, supination, pronation, radial deviation and ulnar deviation; hand metacarpalphalanges flexion, extension, and rotation; and finger extension and flexion of all interphalangeal joints. Note symptoms that are reproduced with AROM. If full AROM of particular area is limited, assess passive range of motion (PROM) of that joint.

To isolate the flexor digitorum profundus function (FDP), hold the involved the finger in full extension at the proximal interphalangeal (PIP) and metacarpalphalangeal joints (MCP). To isolate flexor digitorum superficialis function of a particular finger, hold the other fingers in full extension and have the patient flex the free finger at the PIP joint.

To be able to pinch the thumb and forefinger, the median, ulnar, and radial nerves all must be functional. To oppose the thumb and little finger, the median and ulnar nerve must be intact. Place a piece of paper between the patient’s fingers and try to remove it to test intrinsic hand-muscle adduction strength.

Test sensory distribution by checking the index finger tip for the median nerve, the little finger tip for the ulnar nerve, and the dorsal first web space between the thumb and index for the radial nerve. The motor peripheral nerve distribution is: ulnar nerve for hand intrinsic muscles, median nerve for thenar function, and radial nerve for wrist and finger extension. It is of interest that the posterior interosseous nerve (PIN), a branch of the radial nerve, actually supplies motor innervation of wrist extension, but not sensory innervation of the dorsum of the hand. PIN syndrome is compression of the PIN after the branch separates from the radial nerve in the proximal forearm—the patient presents with inability to extend the wrist but with normal radial sensation of the hand.

The radial and ulnar arteries provide the blood supply to the hand, passing through the carpal tunnel and Guyon’s canal respectively. Allen’s test assesses collateral circulation of the arcade formed by these two arteries.
Compress both ulnar and radial arteries at the wrist and have the patient clench his fist; then have the patient open his hand palmar side up (the palm will be pale) and then release the compression on the ulnar artery. With good ulnar flow, the palm will turn pink right away. Repeat, releasing the radial artery first to check radial artery patency.

**DeQuervain’s tenosynovitis: golf, fly fishing, racquet sports**

DeQuervain’s is tenosynovitis of the thumb’s abductor pollicis longus (APL) and the extensor pollicis brevis (EPB), and was first described in 1895. The condition arises with repetitive activity that requires a forceful grasp with ulnar deviation or repetitive thumb use. Patients localize pain at the radial side of the wrist and thumb, and the symptoms can extend proximally. Parasthesias distally or associated conditions like carpal tunnel or trigger finger are not uncommon.

Pain is reproduced with resisted thumb extension and abduction. A positive Finkelstein’s test is pathognomic for DeQuervain’s—that is, reproduced pain with passive ulnar deviation of a closed fist (Fig. 1). Maximal tenderness is usually around the radial styloid. It is important to distinguish between snuff box tenderness, where the scaphoid bone lies, and tendon tenderness. The two tendons (APL and EPB) together form the radial border of the anatomic snuff box. If there is a trauma history, a fall on an outstretched arm, or tenderness on the distal radius or over the scaphoid, plain radiographs should be considered.

Treatment includes nonsteroidal anti-inflammatory drugs (NSAIDs), ice, rest and immobilization with a wrist splint with thumb spica. For injection, use 0.5 cc of triamcinolone acetonide (Kenalog, 40 mg/ml) and 0.5 cc of 0.5% bupivicaine with a 25-gauge 1" needle, and inject along the tendon sheath at the point of maximal tenderness.

Fig. 1. Finkelstein’s test.
Skier’s thumb (ulnar collateral ligament): collision sports

Commonly referred to as a skier’s thumb or gamekeeper’s thumb, this is an injury to the ulnar collateral ligament (UCL) of the thumb at the metacarpophalangeal joint. The UCL attaches proximally to the distal thumb metacarpal and distally to the proximal thumb proximal phalanx. It provides stability to the joint, especially in gripping and pinching, by preventing overabduction and extension.

The mechanism of injury is forced abduction and extension, such as in a fall holding a ski pole or a fall on an outstretched hand with thumb extended. On examination, there will be swelling and tenderness over the UCL. The MCP joint is stressed by gently applying radially directed force to the thumb while stabilizing the metacarpal—do this with the MCP both at 0° and slightly flexed at 30°. At 0° there is more natural stability to the joint, while the flexed position isolates the UCL as a joint stabilizer. Feel for increased laxity, a soft or nonexistent end point, and gaping of the joint, as compared with the other side. Most UCL ruptures will occur at the distal attachment.

Differentiating between a partial and full-thickness UCL tear on examination presents a challenge. Stress radiographs have been advocated by some, with a greater than 30° difference between the injured and uninjured thumb on stress views proposed to be significant for a complete UCL tear [4]. Other diagnostic imaging techniques, such as MRI, are not routinely ordered, and MRI’s usefulness in differentiating a complete versus incomplete tear has not been definitively demonstrated.

The other difficult diagnostic challenge for the examiner is whether a Stener lesion is present. A Stener lesion occurs when the thumb adductor muscle aponeurosis interposes between the two ends of the ruptured UCL, preventing UCL healing by immobilization alone. Again, even with the development of MRI wrist-specific coils, the accuracy is unclear and the role for MRI here still lacks consensus. In the future, better technology may change the role of diagnostic MRI imaging. The presence of a Stener lesion is a prime indication for surgical intervention. Unfortunately, the most reliable way to diagnose a Stener lesion is at the time of surgery.

The provider examining the athlete who has an injured hand after a fall should have a high index of suspicion for a UCL injury. If a UCL injury is suspected, immobilize the patient with a thumb spica splint, obtain radiographs to rule out an associated fracture, and start oral NSAIDs. Re-examine after 2 weeks. If there is persistent laxity and gaping of the MCP joint with stress testing, consider referral to a hand surgeon. Although a complete UCL tear can continue to heal nonoperatively, the presence or absence of a Stener lesion cannot be determined externally. Depending on the clinician’s level of comfort, the patient can continue to be immobilized for up to 6 weeks with regular examination intervals. Primary surgical repair can be performed from 6 to 8 weeks after injury without affecting outcome, so there is a window for a trial of nonoperative management [5].
If there is improvement in the symptoms and examination at 2-week follow-up, with negative radiographs or an undischplaced avulsion fracture, continue thumb spica immobilization for another 2 to 4 weeks. Once there is no tenderness and no MCP laxity, the thumb can be splinted during sports only (if possible) for another month for protection during the maturation healing stage of the UCL. An avulsion fracture can also occur. If it is minimally displaced, less than 3 mm, the treatment is the same.

Mallet finger: ball sports

A rupture of the distal extensor tendon in a finger is termed a mallet finger. This occurs when the distal phalanx is forced into flexion while at the same time the distal interphalangeal joint (DIP) is being actively extended, such as when an athlete is catching a ball. It is not unusual in basketball, football, or the like—the athlete may describe getting his or her finger “jammed.” Given the mechanism, it makes sense that the middle finger, the longest one, is most commonly involved, although a mallet finger may involve any of the digits, including the thumb. Physical examination reveals some local swelling and tenderness in the acute presentation, and an inability to extend at the DIP joint; at rest the distal phalanx is in slight flexion. Passive extension at the joint is possible. In a chronic presentation of distal extensor tendon injury, a swan-neck deformity appearance can occur with hyperextension at the PIP (caused by a retraction of the avulsed extensor mechanism) and flexion at the DIP.

Plain radiographs should be obtained for a mallet finger, because a bony avulsion of the distal phalanx can occur. A bone fragment that involves more than a third of the articular surface of the DIP joint may be unstable and should be referred for possible surgical fixation (Fig. 2).

If the avulsion fragment is small or there is no bone involvement, nonoperative treatment is preferred. Splint the DIP in full extension, applying the splint to the dorsal side, leaving the PIP free. The splint should be left on at all times and the joint protected, for a full 6 to 8 weeks. An additional 6 weeks of splinting can follow if there is not a full ability to extend against resistance. After full active DIP extension is achieved, a gradual withdrawal of the splint can be instituted, with wearing of the splint only at night and with sports, for another 6 weeks. Participation in sports is acceptable as long as the DIP is firmly immobilized in extension and is protected against further injury.

In chronic mallet finger presentations, without significant bone involvement, splinting in extension should still be attempted. In the chronic case, however, the DIP should be splinted for a longer time period—anywhere from 2 to 3 months in continuous extension, depending on the response to immobilization.

Mallet thumb can be treated similarly to mallet finger, with a trial of splinting in extension; however, because larger forces are required to cause
Mallet thumb, check imaging to evaluate for fracture and consider earlier surgical intervention than with the same injury in a triphalangeal digit.

Jersey finger: tackling sports

A disruption of the flexor digitorum profundus is termed a jersey finger. As in trying to grab someone by the jersey while making a tackle, the mechanism of injury is the finger being pulled or forced into extension while at the same time the DIP is being actively flexed. Contrary to my belief as a medical student, the term does not refer to the state of New Jersey. The ring finger is commonly involved (in up to 75% of cases), although as with mallet fingers, any of the digits can be so injured. Certain rugby jerseys available are made of a material that the players believe will tear less easily and therefore predispose one’s opponent to “breaking their fingers” (Kathy Stahl, personal communication, 2004).

There is localized tenderness on examination and an inability to flex the DIP. There may be tenderness or a complaint of pain more proximally anywhere along the flexor tendon sheath, because the FDP can retract after rupture. Hold the PIP in extension to isolate the action of the FDP and ask the patient to flex the DIP—with a FDP rupture, the patient will be unable to do so. Be careful to check FDP function in the patient complaining of pain and tenderness even in the palm. Radiographs should be obtained to evaluate for chondral involvement.

In contrast to the mallet finger presentation, surgical referral is the treatment of choice upon presentation, especially in an acute setting. Depending on the level of FDP retraction, full functional outcome is best with early surgical intervention. In the acute rupture, if the tendon retracts
to the palm, surgery should be considered within 7 to 10 days. If the ruptured tendon retracts to the PIP joint, and the athlete is in the middle of season and cannot be out of sports for the 8 to 12 weeks of postoperative recovery, a 6- to 8-week delay in surgery may be considered, accepting the risk of suboptimal result [6]. In the chronic presentation, the functional impairment is fortunately often minimal or negligible, and benign neglect by the provider and athlete may be the treatment of choice. Operative intervention is also an option in the delayed or chronic case, but if there is no pain or disability, this is a less attractive treatment to both surgeons and patients alike.

**Trigger finger: racquet and club sports**

Trigger finger refers to a flexor tenosynovitis. A nodule can form by overuse or by direct pressure in the flexor tendon sheath. Mechanical catching occurs usually under the A1 pulley at the MCP level, although triggering can also occur at the PIP level. The patient complains of inability to extend the joint, often in the morning, and can usually reproduce the triggering in the office. A cortisone injection directly into the palpable nodule or thickened tendon sheath can be very helpful, and can be repeated once or twice. Most cases, up to 90%, will improve this way nonoperatively.

**Boutonnière deformity/pseudoboutonnière/volar plate injury**

The boutonnière injury or deformity refers to a rupture of the central slip of extensor tendon at the PIP joint. There is a similar mechanism of injury as in a mallet finger—forced PIP flexion at the same time the PIP is being actively extended. The athlete is unable to extend the PIP, but full passive extension is easily obtained. The DIP is in slight hyperextension at rest. The treatment is also similar to the mallet finger—splint the PIP in full extension for 6 to 8 weeks in the acute injury. In the chronic boutonnière injury, there may be a PIP flexion contracture, and serial splinting may be needed to achieve full active extension.

A pseudoboutonnière deformity looks similar to the boutonnière, with the PIP in flexion and the DIP in extension; however, the mechanism and etiology are different. The pseudoboutonnière deformity results from a PIP volar plate injury (from PIP hyperextension) and resulting PIP flexion contracture, rather than an injury to the extensor side central slip. In the pseudoboutonnière, the DIP extension is a consequence of the PIP flexion contracture, and is generally less severe than in a true boutonnière deformity. A radiograph may reveal an old volar plate injury, and help differentiate a pseudo from a true boutonnière deformity. Treatment of a pseudoboutonnière deformity is similar to that for other flexion contractures: progressive stretching of the contracture with dynamic splinting is performed before consideration of surgical release.
Boxer’s knuckle

Boxer’s knuckle is an injury to the extensor hood of the MCP joint. The extensor hood is composed of the central extensor tendon (extensor digitorum communis) and transverse sagittal bands; the extensor hood glides over the underlying MCP joint. A disruption of the extensor hood may be accompanied by a joint capsule injury, as well as subluxation of the extensor tendon. The mechanism is repetitive direct trauma to the MCP, and occurs most frequently in the middle finger.

History and physical may reveal pain, swelling, a decreased ability to extend the joint, and a palpable defect over the MCP. Left alone, boxer’s knuckle can lead to significant disability, and could be career ending in someone like the professional boxer. Treatment in the past has included splinting in extension for 6 weeks, with mixed results. A more recent case series demonstrated successful outcomes with going right to surgical repair and stabilization, with return to sport and full range of motion occurring at about 5 months; interestingly, associated capsular tears did not need to be repaired surgically [7]. As with other hand injuries, prevention is the best approach, and includes protection and appropriate training and supervision for those athletes at risk.

Other fractures and dislocations of the wrist and hand

A complete review of all hand and wrist fractures and dislocations would and does fill entire textbooks. There are a number of bony injuries that are commonly seen in athletic injuries and that can be managed by the primary care physician in the office. The principles of assessment, management, and knowing when to refer are important: a high index of suspicion, especially with trauma; neurovascular examination; associated or related injuries; appropriate imaging; protection of the injured area; close follow-up; and an awareness of possible complications. Fractures that are significantly displaced, comminuted, unstable, or with significant intra-articular involvement should be referred; evidence of neurovascular compromise or open fractures should be referred emergently. The goal of fracture management is successful union of the bone.

Boxer’s fifth metacarpal fracture

A fracture of the neck of the fifth metacarpal is termed a boxer’s fracture. This is somewhat of a misnomer, because boxers learn not to punch this way, and the injury is seen more commonly in a lay person striking a hard object with a closed fist. The fracture is just below the metacarpal head and is usually displaced in a volar direction. Also assess for malrotation by examining the direction of the fingers in flexion. No malrotation is acceptable in treatment, as in phalangeal fractures. Fortunately, however,
a fair amount of volar angulation is acceptable for nonoperative management—up to 40° in the fifth metacarpal. Less angulation is acceptable in the second and third metacarpals, because they are less able to compensate. Immobilize in splint initially to allow for swelling. Use an ulnar gutter splint, with the fourth and fifth MCP joints in a 90° flexed position. Close follow-up with repeat radiographs is indicated to check for further displacement. Immobilization is necessary for 4 to 6 weeks.

**Phalangeal fracture**

A fracture of the shaft of the proximal or middle phalanx can be traverse, oblique, or spiral. Oblique and spiral fractures have more associated malrotation. No malrotation is acceptable; assess in the same way as for a metacarpal fracture. All the flexed fingers should be pointing in the same direction if there is no malrotation. Nondisplaced shaft fracture should be splinted using an aluminum finger splint, including the joint above and below the fracture, with the joints at 30° flexion. Continue for 2 to 3 weeks, and if improved clinically, when the fracture site is non-tender advance to buddy taping to the adjacent finger. Sports may be allowed as long as adequate protection of the fracture is possible. Displaced or malrotated fractures should be reduced; closed at first, but then surgically if indicated.

**Proximal interphalangeal dislocation**

Most are dorsal dislocations, with the middle phalanx dislocating dorsally, and involve disruption of the volar plate. Often the athlete reduces the finger himself, or a coach does it (hence the term “coaches’ finger”)—reduction can be obtained with traction and flexion of the middle phalanx. Precede the reduction with gentle hyperextension of the PIP to free the middle phalanx from its dislocated position on the proximal one; then, applying gentle axial traction, flex the middle phalanx till it reduces. The main goals are to enable volar plate and collateral ligament healing, and to restore normal joint function.

After reduction, splint the finger with the PIP in 30° flexion. Extension block splinting can be used alternatively. Check plain radiographs. If there is a intra-articular fracture involving more than a third of the joint, consider referral for an unstable fracture. Otherwise, allow 2 to 4 weeks for the volar plate, joint capsule, and collateral ligaments to heal. Ice, elevation, and NSAIDS are indicated. Follow up the splinting with buddy taping to the adjacent finger for another 2 to 4 weeks. Isolated PIP volar plate injuries from a hyperextension injury can be treated the same way. Complications can include a swan-neck deformity or a flexion contracture (pseudo-boutonnière deformity), from a chronically dislocated PIP joint with compensatory changes or a volar plate injury, respectively. Another less desirable outcome is a nonunion of a fracture/dislocation of the PIP,
perhaps resulting in a deformity in appearance and an impairment in joint function.

**Distal phalangeal injuries**

Injury to the distal phalanx includes nail or nail bed trauma, as well as fracture of the distal phalangeal shaft or tuft. These usually occur from a crush type mechanism. For a closed tuft fracture or minimally displaced shaft fracture, protection and pain relief are the treatment. An aluminum finger splint can be applied, covering the dorsal and volar side to protect from further trauma and to allow bony healing to take place.

Injuries to the nail bed can be repaired with 5-0 or 6-0 suture after removing the nail, otherwise abnormal nail growth can occur. Subungal hematomas can be drained for pain relief in sterile fashion, using a heated 18-gauge needle or other similarly sterilized object to drill a hole through the nail itself. If the nail is removed after injury, consider placing a “splint” such as sterile petroleum gauze under the eponychium to prevent premature closing of this space, which would interfere with new nail growth. A new nail can take 3 to 6 months to grow.

**Bennett fracture**

A Bennett fracture is an avulsion injury of the proximal thumb metacarpal bone, on the ulnar side. The mechanism is classically an axial load to the flexed and adducted thumb, occurring in a throwing athlete on follow-through, with the thumb striking a helmet, the ground, or another athlete. This is an unstable fracture and should be referred for consideration of surgical intervention. The thumb metacarpal is stabilized by a ligament at the ulnar base that attaches to the trapezium; a proximal metacarpal fracture on the ulnar side allows the rest of the metacarpal to move out of anatomic alignment. Rolando fractures are similar in location and etiology, but are comminuted—refer this injury for surgical consideration also.

**Summary**

Many athletic injuries of the hand commonly present to, and can be managed by, primary care physicians. Knowing when to refer is also obviously important. This article is not meant to be an exhaustive list of all possible hand injuries. Rather, it is meant to serve as a useful guide to the primary care physician.

For the busy primary care physician, a thorough assessment of the hand or wrist complaint includes a focused history and physical and the judicious use of supportive diagnostic testing. Know your anatomy and sport. This will set the foundation clinically for the best possible outcome. Ultimately, the goals of assessment and management are to restore, maximize, and preserve function.
References