Although most people consider a leisurely round of golf a relatively safe activity, the incidence of injuries to the wrist is much higher in golf than in most other sports. Various studies of professional golfers have reported a 34–37% chance of wrist injury.¹,² Most injuries occur in the left wrist (of a right-handed swinging golfer), which can be divided into two categories: (a) chronic overuse injuries such as tendonitis, impaction or impingement, stress fracture and nerve compression and (b) traumatic or acute injuries, such as fracture and ligament sprain or rupture. The following case review relates the clinical presentation of an amateur golfer who suffered a tear of the retaining retinaculum of the left extensor carpi ulnaris and the nature of the subsequent surgical repair and rehabilitation process.

**Case Study**

A 32 year-old, right-handed male injured his left wrist while playing golf. The injury occurred as he accelerated through ball impact from the downswing. At the moment of ball impact, he felt a pop in his left wrist, which was immediately painful and forced him to discontinue play. The golfer related that ulnar deviation of his wrist produced a painful popping sensation. The examination by an orthopedic surgeon at one day post-injury revealed that he was moderately tender along the extensor carpi ulnaris (ECU) tendon (Figure 1), with minimal tenderness over the ulnar aspect of the carpus and lunotriquetral ligament. He had full active and passive range-of-motion of his wrist, with extension to 75 degrees and flexion to 90 degrees. All fingers demonstrated full range-of-motion. His motor examination failed to reveal any evidence of extrinsic or intrinsic atrophy, and all musculotendinous units were functioning independently at a 5/5 strength level. Grip strength was 130 lbs. for the right extremity and 15 lbs. for the left extremity. Pinch strength was 26 lbs. for the right extremity and 22 lbs. for the left extremity. The sensory exam was normal, and x-rays failed to reveal any evidence of fracture or dislocation nor any evidence of static intercarpal instability. Provocative testing, including varus, valgus, wrist glide, and carpal tunnel tests, revealed subluxation of the ECU over the distal end of the ulna, especially with the forearm in supination and the wrist in ulnar deviation. The athlete was diagnosed with a rupture of the restraining retinaculum of the ECU tendon. Surgery was recommended, but the patient elected to delay the procedure for ten days, until his return from a golf trip.

In order to facilitate the athlete’s ability to play pain-free competitive golf, a protective strapping was fabricated. A half-moon shaped piece of 1/4-inch felt padding was placed medial to the distal ulna (Figure 2).
which was secured by transverse strips of elastic athletic tape that encircled the wrist (Figure 3). In this manner, the ECU tendon was compressed and prevented from subluxation over the distal ulna during the ulnar deviation necessary to perform the golf swing. The athlete reported no pain during play on the golf course. He stated that his only adaptations to the injury were use of a looser club grip to limit supination during the swing follow-through and “club down” on his golf shots to control distance with a smooth swing. For example, he would use a 6-iron for a situation that would normally be estimated to represent a 7-iron distance. Ice was applied post-activity to limit pain and swelling.

The surgical procedure consisted of creating a sling from one strip of the retinaculum, encircling the ECU, and then closing the tear in the retinaculum. Post-surgery, the patient was placed in a posterior long-arm splint, with the wrist in a neutral position, for a period of three weeks. Subsequently, the patient was placed in a short-arm splint and rehabilitative exercises were initiated. The patient performed active and passive wrist range-of-motion exercises, along with general strengthening exercises, for wrist flexion and extension, abduction, and forearm supination and pronation. Therapeutic exercise was performed twice weekly for one month under the direction of a hand therapist. A home-exercise regimen was continued for the subsequent three months. Ulnar deviation was limited during the first two weeks of rehabilitative exercise and then progressively increased over the duration of the patient’s rehabilitation program. Four months post-surgery, the patient returned to his professional role as a physician assistant. Five months after surgery, he returned to full participation in golf with no adverse consequence. He continues to apply a preventative taping as a protective measure.

Discussion

The golf swing consists of five phases: (a) approach/set-up, (b) backswing, (c) transition, (d) downswing, and (e) follow-through. Each phase involves a unique movement and appropriate technique. The approach, or set-up, phase is the period of time during which the golfer positions himself or herself behind the ball and prepares to swing. The ball is placed slightly ahead of the body midline and far enough away from the body to allow for a slight bend in the knees, hips, and waist of the golfer. The golfer then shifts his or her weight onto the back leg and begins the backswing. The backswing is compared to coiling a spring. With a flat back, the torso is wound around, bringing the club head away from the ball and back over the right shoulder of a right-handed golfer. The transition phase consists of the short amount of time between backswing and downswing, i.e., as the club head reaches peak potential energy and then reverses its motion to accelerate toward the ball. The downswing is the uncoiling phase, during which the club head strikes the ball with maximal energy. The trunk unwinds and both elbows extend as contact is made. The follow-through phase is simply the continuation and eventual termination of the club’s motion after contact with
the ball. Although most chronic injuries are a result of excessive play and/or improper form during a portion of the swing, acute injuries are most likely to occur during the downswing phase.4

Unfortunately, the anatomy of the wrist seemingly lends itself to traumatic injury from an improper golf swing. Even the most skilled golfers may accidentally “swing long” and contact the ground rather than the ball. The tightly packed and bundled structures of the wrist are unable to withstand the resultant reaction force, resulting in damage to the structures. “Often called the ‘back’ of the upper extremity, the wrist is one of the most complex and poorly understood joints of the body.”5

The extensor carpi ulnaris (ECU) tendon lies within the sixth dorsal compartment of the wrist. Injury to this structure can occur in conjunction with disruption of the extensor retinaculum that surrounds the wrist, bundling all tendons and ligaments tightly to the ulna and radius. Palpation of the injured ECU will elicit tenderness over the ulnar styloid. A clicking may even be heard as the tendon subluxes over the distal ulna. The clinician should palpate the tendon’s movement during supinated ulnar and radial deviation.6 Conservative treatment involves use of a long-arm cast, with the extremity in a position of wrist radial deviation and forearm supination, for up to 6 weeks.3,7 If ECU subluxation becomes chronic, which may result when a golfer chooses to continue to play, surgical repair often becomes necessary.8 The supportive device fabricated from 1/4-inch felt padding and elastic athletic tape served as a buttress restraint to subluxation of the ECU tendon until the surgical procedure was performed.

The relevant literature suggests that there are two important considerations for treatment and/or surgical repair: (a) the activity level of the golfer (i.e., occasional player vs. competitive player) and (b) the individual’s specific functional goals. The time required for recovery from the surgical procedure and the duration of rehabilitation that will be necessary for full restoration of function may also be important to informed decision making by the patient.

Oka and Handa9 reported the case of a 20-year-old golf trainee who suffered from chronic subluxation of the ECU tendon but who did not experience a traumatic event. His repair and rehabilitation were completed in an accelerated manner, with full return to activity at only one month post-surgery. In consultation with the patient, they elected to perform a surgical procedure that involved suturing the retinaculum beneath the ECU tendon. The distal ulnar styloid was also resected to prevent recurrent tendon subluxation, which was associated with a “snapping” sensation that the patient described as his primary complaint. With the position of the ECU tendon superficial to the compartment, rehabilitation time was decreased. The retinaculum healed faster and was subjected to less stress than if the ECU tendon had been contained beneath it.

Ultimately, the goals of the patient should be the primary consideration when deciding whether or not surgery is necessary, and if so, the same consideration should guide selection of the surgical procedure to be performed. In the present case, the patient needed to be able to return to his duties as a physician assistant with surgical responsibilities. Wrist range-of-motion and strength were very important, both in terms of professional and recreational considerations.

Traumatic wrist injury during golf is relatively infrequent, but the long-term implications of such an injury may affect much more than the patient’s golf game. Careful evaluation, collaborative decision making with the patient, and thorough rehabilitation can facilitate a full return to both professional and recreational activities.

References


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