

Review

Four Common Upper Body Injuries in Tennis Players: Prevention, Description, and Treatment

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The average tennis player gets injured 2-3 times every two years. This may not seem relevant but when added over a lifetime career in tennis these numbers become significant. This is why it is important to be aware of the most common tennis injuries, as well as the best prevention and treatment methods for each injury. This literature review will discuss four of the most common tennis injuries, which include tennis elbow, tendonitis, shoulder bursitis, and a rotator cuff tear. This review covers how to prevent and treat them, with a focus on the elbow and shoulder as two of the most common places for injury in tennis players.



Figure 1. Location of lateral epicondylitis pain (red)

REVIEW

Tennis elbow, or lateral epicondylitis, occurs when the elbow is overloaded with repetitive motion and represents an inflammation of the tendons: symptoms include burning or pain on the outer elbow, a swollen elbow, and stiffness or pain in the area.¹ Tennis elbow mainly affects grip strength and may cause pain while swinging the racket over the shoulder. This pain mostly occurs from the repetitive impact of the tennis ball on the racket, which sends vibrations up to the elbow, and thus over time, wears down the tendons and causes swelling and pain. Tennis elbow injuries appear in everyday jobs outside of tennis as well. Many times, workers who handle equipment that requires repetitive arm movement also develop injuries very similar to tennis elbow [Figure 1].

There are two main types of tennis elbow: inflammatory and non-inflammatory. Inflammatory injury involves swelling and warmth in the injured area as well as slight tenderness while non-inflammatory injury does not have any warmth or swelling. Treatment for both injury types follow the steps of strengthening for stability as well as

rest.¹ If pain persists, sometimes ultrasound therapy and sports tapes can be used to decrease pain.² Some of the most common risk factors of tennis elbow include poor mechanics, gripping the racket too tightly, older age and smoking. Poor mechanics, such as overswinging, may put extra stress on tendons which causes more wear and tear on affected areas. Smoking and older age both decrease the ability of the body to heal damaged tendons which is why they increase the risk of injury. In most scenarios, recovery from tennis elbow can be measured by testing grip strength. In rare cases, cervical radiculopathy can sometimes be mistaken for tennis elbow as well as ligamentous instability and posterior interosseous nerve entrapment.³ These injuries will not resolve with the Protection, Rest, Ice, Compression and Elevation (PRICE) method and won't have the same risk factors as tennis elbow. Patients with symptoms of tennis elbow should keep these injuries in mind, as they may pose a large threat to physical health if they go untreated.

Tendinopathy in tennis players includes a variety of tendon-associated injuries which are commonly localized to the shoulders in response to overuse. There are two main types of tendinopathy in tennis players that tend to occur in the shoulder: tendonitis and tendinosis. Tendonitis is irritative inflammation of the tendons primarily affecting players' shoulders due to serving and overhead motions during tennis play inflammation associated with tendonitis can cause pain, swelling, and warmth in the affected areas.⁴ Lack of adequate stretching and movement before intense training alongside tendon impingement can greatly increase the risk of tendonitis in tennis players. The first step for treatment of shoulder tendonitis is resting and stopping painful movements. Then, ice can be used to calm inflammation and swelling as well as reduce discomfort. For tennis athletes, shoulder tendonitis can be the first symptom of a more severe tendon-related injury, tendinosis.

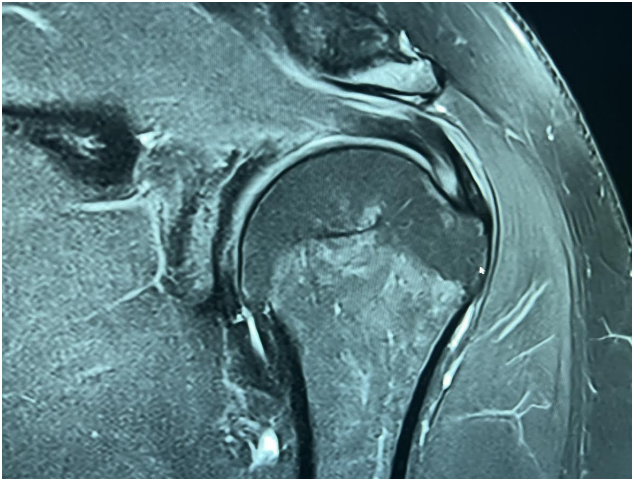


Figure 2. Location of shoulder bursitis (Orange) and partial tear of the supraspinatus (Red)

Tendinosis is the breakdown or degeneration of collagen fibers in the tendon. In contrast to tendonitis, tendinosis has much more severe symptoms which lead to weakened motion and higher levels of pain.⁵ Tendinopathy of the shoulder is mainly caused during the deceleration portion of serves. Due to many tennis players' decreased external rotation strength, athletes overwork their shoulders more often, and thus degenerative injury occurs more frequently. In higher level athletes this muscle imbalance may be more pronounced due to a much stronger pectoralis muscle accelerating the shoulder. Players ages 20-33 years are most prone to this injury because they have developed pectoral muscles and tend to accelerate their shoulders faster than younger athletes and older athletes. Tendinopathy can also lead to impingement, which may cause tears in the future. The most effective treatment methods for tendinosis are rest, ice, and anti-inflammatory medication as well as physical therapy and refraining from moving the injured shoulder.

Bursitis is a condition caused by inflammation of the bursa, which are sac-like structures that contain fluid and provide cushioning between joints.⁶ Tennis players are particularly susceptible to bursitis due to the repetitive nature of serving and other overhead motions. This injury is most common in the shoulder area, particularly the acromioclavicular joint and the glenohumeral joint, which are put under stress during serves and other overhead motions [Figure 2]. It is also very common at the elbow joint [Figure 3]. Common symptoms of bursitis include pain, swelling, tenderness, limited range of motion, and redness in the affected area. There are two types of bursitis: aseptic and septic.

Aseptic bursitis is characterized by swelling of the bursa without any accompanying infection.⁶ This is the more common form of bursitis experienced by tennis players. Nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or aspirin, as well as RICE (rest, ice, compression, and elevation), can be used to treat aseptic bursitis. In more severe cases, steroid injections, splints, or braces might be necessary to provide additional support and pain relief.



Figure 3. Clinical photograph (left) and radiograph (right) demonstrating the inflammation associated with elbow bursitis.

Septic bursitis, on the other hand, is caused by bacteria infecting the site of the injury and inflaming the bursa.⁶ This requires more intensive treatment such as antibiotics to address the infection. In severe cases, surgical removal of the bursa may be necessary. In less severe cases, fluid extraction via needle aspiration may be employed. Preventing bursitis is essential, especially for tennis players. Proper warm-up exercises, maintaining good posture and form, and taking adequate rest breaks during repetitive activities such as serving are key preventive measures. Early diagnosis and treatment of bursitis symptoms are crucial to effective management.

A rotator cuff tear is where the tendons that cross the humerus develop either a partial or full tear.⁷ A partial tear is when the tendon is thinned out but still connects the bone and muscle [Figure 4]. A full-thickness tear occurs when the tendon no longer connects the bone and muscles [Figure 5]. These two types of tears, most commonly partial articular-sided tears, are very common in tennis players' shoulders and mainly occur from overheads and serves.⁸ These two shots induce substantial, degenerative damage to the rotator cuff tendon, and therefore make tennis players very prone to injury. In most cases, non-operative treatment will resolve the injury, but in severe cases, operative treatment is the only option. Non-operative treatment involves rehabilitation therapy and rest; in older patients, corticosteroid injections can help, but research has shown that in elite and youth athletes these injections are ineffective.⁸ Operative treatment includes debridement and partial or full rotator cuff repair. These treatment options are very rare and are only necessary in the most severe cases.

To prevent rotator cuff injury, it is important to rest and give muscles ample recovery time. The most important prevention method though, is rest; Alrabaa, et al. state "adequate rest between tennis matches can help minimize injury as studies have shown alterations in shoulder range of motion and scapular kinematics after prolonged play that self-resolve with rest".⁸ It is also important to be aware of risk factors that may greatly increase the chances of rotator cuff tears and increase the severity of those injuries. Internal impingement is the leading cause of rotator cuff tears, and studies have shown that athletes with impingement are even more likely to have rotator cuff tears from overhead throwing motions such as serving and overhead motions; this requires a holistic approach to the evaluation of injuries, ensuring to account for the possibility of full-thickness rotator cuff tears with less severe shoulder pain.⁹ To



Figure 4. Location of Shoulder pain from rotator cuff tear

prevent injury it is always best to consider individual risk factors and leave adequate time for rest and muscle and joint recovery.

Injury in athletes is always lurking around the corner, and that is why it is important to know what the most common tennis injuries are and how to best avoid them. One should take into account rituals that may help reduce the likelihood of getting injured such as actively stretching every time before playing and giving their muscles adequate time to rest and recover before the next tennis ses-

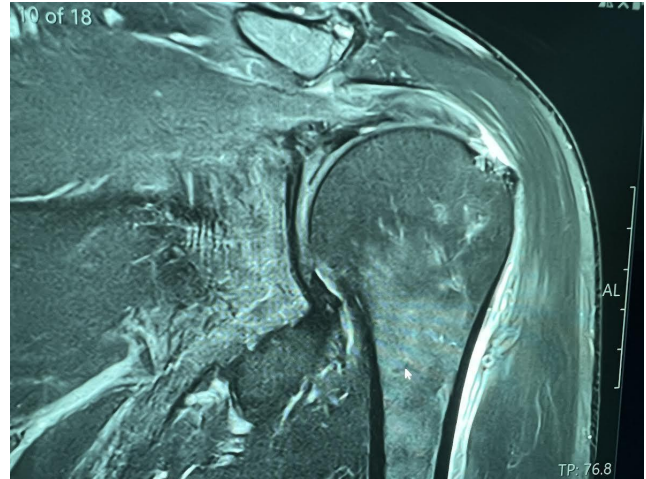


Figure 5. Full thickness tear of the supraspinatus

sion. Most of all, it is important to know the capabilities of your own body, and a doctor or medical professional should always be consulted to determine the diagnosis and best course for treatment.

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