Lateral Epicondylitis

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Abstract

Lateral epicondylitis, commonly known as “Tennis Elbow,” is a common condition that typically affects active individuals in their 30s to 50s. Pain on the lateral (outside) aspect of the elbow is the most common presenting symptom. The diagnosis can be made based on patient history and physical exam. The overall prognosis is excellent. Although symptoms can last up to eighteen months, the vast majority of patients don't require surgery to improve. For the small percentage of patients with persistent symptoms, despite non-operative treatment, surgery can be effective with minimal risk.

Background Information

Lateral epicondylitis is the medical term for the condition commonly known as “Tennis Elbow.” In the past, this condition was called “Lawn Tennis Arm.” Despite these popular terms, over 90% of patients diagnosed with lateral epicondylitis do not play tennis. Lateral epicondylitis is a common disease that affects a different range of people.

It is estimated that about 1%-3% of adults in the United States develop symptoms from lateral epicondylitis each year. Typically, patients develop these symptoms between the ages of 35 and 55. Men and women are affected equally; however, there is a higher frequency of lateral epicondylitis among manual laborers who use heavy tools (i.e. construction workers). The dominant arm is most commonly affected.

On the lateral (outside) aspect of the elbow, a group of muscles originate from the lateral epicondyle (bony prominence) of the humerus (arm bone). These muscles aid in extending (straightening) the wrist and the fingers. The beginning of these muscles is commonly referred to as the “common extensor origin.” These muscles, along with the ligaments of elbow, help to provide stability to the elbow joint. One of these muscles, the extensor carpi radialis brevis (ECRB), is most commonly affected by lateral epicondylitis. In approximately 50% of patients, the extensor digitorum communis (EDC) is also affected.
Why do we get it?

Lateral epicondylitis or tennis elbow is actually not a true “-itis.” The suffix “-itis” typically indicates an inflammatory process. Tennis elbow is actually caused without true inflammation. The disease is characterized by a non-inflammatory tendinosis of the beginning of the ECRB muscle. Wearing and breakdown of the muscle origin causes the body to create new blood vessels. This healing response, however, is abnormal. During the healing process, new collagen is formed. However, the new collagen is disordered, which causes degeneration.

The actual cause of pain is not fully understood. It is believed to be due to multiple reasons. Increased activity of the ECRB muscle (such as with swinging a racket) causes repetitive microtrauma to the muscle origin. Nerve endings within the origin are stimulated with the repetitive trauma causing pain. Also, with repetitive trauma, inflammation within the elbow joint (synovitis) may develop and contribute to the pain.

How do we diagnose it? What are the symptoms?

The most common presenting symptom is pain over the lateral (outside) aspect of the elbow. Typically, the pain is worse with extension (cocking back) of the wrist. Also, repetitive activities that involve flexion and extension of the elbow often elicit the symptoms. A single, traumatic event causing pain is not often the cause. Patients may also complain of difficulty holding objects, pain moving down their arm, or a feeling of elbow instability.

On physical examination, patients usually feel soreness over the prominence, slightly anterior (in front of) and distal (closer to the hand) to the lateral epicondyle (the bony prominence on the outside aspect of the elbow). Sometimes, the patient may have the feeling of warmth in the same area. Certain stimulating tests will reproduce the pain. These tests include: wrist extension against resistance, long finger (middle) extension against resistance, and wrist supination (so the palm faces up) against resistance.

Other conditions that may cause similar symptoms include: radial tunnel syndrome (compression of a nerve in the same area), cervical radiculopathy (pain radiating from nerve irritation in the neck), or a problem within the elbow joint.

Diagnostic studies/testing

The diagnosis of lateral epicondylitis is typically made based upon patient history and physical exam. Occasionally, imaging studies can aid in the diagnosis. X-rays of the elbow may show calcifications.
within the ECRB origin. X-rays are also very useful to help rule-out other causes of pain, such as stress fractures. Magnetic Resonance Imaging (MRI) can also be helpful. MRI may show edema (fluid) and thickening in the muscle origin. It must be recognized that up to 54% of MRIs demonstrate false-positives results (i.e. they make it look like the patient has lateral epicondylitis, when in reality they do not)\. Ultrasound, in the hands of an experienced ultrasonographer, has been shown to help diagnose lateral epicondylitis in approximately 70% of cases\^5. 

**Treatment Options**

In over 90% of cases of lateral epicondylitis, the body will heal the injury without surgery and the patient will become symptom-free\^4. Therefore, the goal of treatment is to help and improve the natural healing process. The progress of treatment follows along with the natural healing response.

The mainstay of treatment is non-surgical. Currently, widely accepted methods of treatment include activity modification (avoiding the activities that cause pain), bracing, non-steroidal anti-inflammatory drugs (i.e. Ibuprofen), physical therapy, injections, and shockwave therapy\^1, 2, 6, 7. Other methods, such as acupuncture, low level laser treatment and massage, have aided in pain-control anecdotaly, but there is no scientific evidence of their effects\^8. More recent methods include denervation, percutaneous tenotomy (tiny incision with cutting of the tendon) and ultrasonic percutaneous tenotomy. These methods need more head to head studies to determine their usefulness.

Surgical treatment is the last resort in regards to treatment of lateral epicondylitis. Surgery is indicated if pain and disability persist after at least six months, and many times twelve months, despite attempting non-operative modalities\^1, 2, 7, 9-11.

**Treatment Outcomes**

*Rest and Anti-inflammatory medication*

As discussed previously, a very large majority of patients have an excellent overall prognosis and will eventually become symptom-free. Rest and anti-inflammatory medications help aid in this process. Anti-inflammatory medications target inflammation both in the elbow joint (synovitis) and within the surrounding tissues. Controlling this inflammation helps to reduce pain. One large study looked at 129 patients who received 28 days of either anti-inflammatory medications or a placebo\^12. Those who received anti-inflammatories had better pain relief, but had more gastrointestinal complications. Overall, there was no improvement in long-term functions\^13. Other studies have shown that rest and medication, although helpful in the short-term, do not alter the natural course of lateral epicondylitis\^1, 2, 12.
Physical Therapy

Physical therapy remains one of the most commonly prescribed, and most effective, treatment options. Classically, physical therapy focused on increasing forearm strength, flexibility and endurance, as well as stretching of the affected muscles. Recently, it has been shown that the addition of a different form of exercise, termed eccentric exercises, aid in the reduction of symptoms. These exercises focus on using various flexible bars to increase the strength and length of muscles and tendons of the forearm. One study showed that the addition of eccentric exercises improved pain, strength, and overall functional scores.  

Injections

The use of injections in the treatment of lateral epicondylitis remains controversial. In regards to corticosteroid injections, published results are mixed. One study, looking at 185 patients treated with injection, observation, or physical therapy, showed significant improvements in the steroid-treated group at six weeks. Long-term follow-up, however, demonstrated that those treated with physical therapy or observation had lower rates of recurrence (9% and 17%, respectively) compared to steroid injection (48%). Other studies showed no benefit at one and six months. Common side effects of corticosteroid injection include skin color changes and the death of protective fat under the skin. Corticosteroid injections can also weaken tendons over time and may cause tendon rupture.

Botulinum toxin (Botox) has also been used in the treatment of lateral epicondylitis. Botox works by blocking the release of important neurotransmitters (acetylcholine) that enable muscles to contract. Like corticosteroids, the results are mixed. One study showed pain improvement with Botox injections over 3 months. Other studies have shown no improvement when compared to placebo. Since Botox works by paralyzing the muscle, the most common side effect is weakness with wrist extension and finger extension.

Most recently, the injection of platelet rich plasma (PRP) has been added to the list of treatment options. Platelet rich plasma is formed by taking a sample of the patient’s blood and removing certain elements so that the final product has high concentrations of platelets and growth factors. This product has been shown to stimulate tendon healing in laboratory studies. As with the other injections, the results have been mixed. Some studies have shown improved pain and function scores compared to steroid injections, while others have found no statistical difference. Importantly, PRP has not been shown to weaken tendons and has nearly no side effects. Plasma rich protein injections, however, could be costly if not covered under the patients insurance.
Surgery

Surgical treatment is reserved for those patients who have failed non-operative treatment modalities and continue to have symptoms at least six months from the onset of symptoms. Some surgeons will wait twelve to eighteen months before proceeding to surgery. Surgical treatment entails debriding (cleaning up) the origin of the ECRB muscle. This procedure can be done through an open incision, percutaneous (very small holes), or arthroscopically (with the aid of a camera).

Overall, the results of surgery are good. One study demonstrated improvement in 97% of patients whom underwent open debridement, with 93% of patients returning to athletic participation. One study of forty patients whom underwent arthroscopic debridement showed that 77% felt "much better" after surgery, and 93% would have surgery again. Comparing open debridement to arthroscopic debridement, some studies suggest that patients have better functional scores and overall results following arthroscopic debridement. Other studies have shown no difference between the various surgical options.

Complications

The risk of complications from surgery remains very low. There is a risk of producing elbow instability, as well as nerve damage, with an open debridement. Percutaneous debridement carries a very small risk of nerve damage. Arthroscopic debridement also carries a small risk of nerve damage and elbow instability. Overall, these risks are less than 1%.

Authors Preferred Treatments

Initial treatment for lateral epicondylitis should always be non-operative. In our experience, we recommend an initial period of rest and anti-inflammatory medications. This allows the initial inflammation associated with lateral epicondylitis to subside. Physical therapy, focusing on eccentric muscle conditioning, should then be initiated. Steroid and PRP injections are reserved for those who continue to have symptoms and are required to perform manual labor to stay employed or support themselves. Operative treatment is rarely performed. We suggest consideration of operative treatment if a patient fails multiple non-operative modalities over the course of a year.

Conclusion

Lateral epicondylitis, “Tennis Elbow,” is a common condition that typically affects active patients in their 30s-50s. For a majority of patients, the overall prognosis is excellent. The typical natural history of lateral epicondylitis is to improve over time. Treatment options work along with the natural history, aiding the steps of healing. Surgery is reserved for the rare cases in which symptoms remain after at least six months of non-operative treatment. If surgery is required, risks are low and patients typically...
do quite well. There are many research studies evaluating the various treatment options with varied results. Lateral epicondylitis is one of the most common problems seen in the office, being the most common cause of elbow pain but at this time there is no perfect treatment option.

Bullet Points

Lateral epicondylitis, also known as “Tennis Elbow,” is common disorder that affects active individuals in their 30s-50s.

The most common symptom is pain on the outside part of the elbow with elbow and/or wrist motion.

Overall scenario is typically excellent, with a vast majority of patients’ symptoms resolving over twelve to eighteen months.

Anti-inflammatories, physical therapy, shockwave therapy and occasionally injections are the preferred non-operative treatment modalities.

Surgery is reserved for those patients who continue to have symptoms despite extensive non-operative treatment.

References


