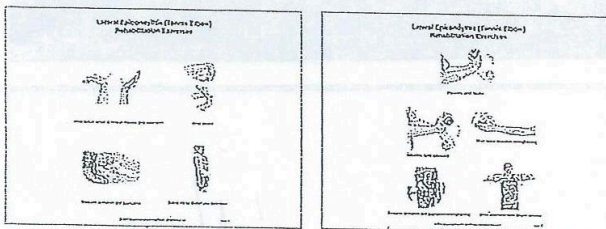


Tennis Elbow (Lateral Epicondylitis) Exercises



You may do the stretching exercises right away. You may do the strengthening exercises when stretching is nearly painless.

Stretching exercises

Wrist active range of motion: Flexion and extension: Bend the wrist of your injured arm forward and back as far as you can. Do 2 sets of 15.

Wrist stretch: Press the back of the hand on your injured side with your other hand to help bend your wrist. Hold for 15 to 30 seconds. Next, stretch the hand back by pressing the fingers in a backward direction. Hold for 15 to 30 seconds. Keep the arm on your injured side straight during this exercise. Do 3 sets.

Forearm pronation and supination: Bend the elbow of your injured arm 90 degrees, keeping your elbow at your side. Turn your palm up and hold for 5 seconds. Then slowly turn your palm down and hold for 5 seconds. Make sure you keep your elbow at your side and bent 90 degrees while you do the exercise. Do 2 sets of 15.

Active elbow flexion and extension: Gently bring the palm of the hand on your injured side up toward your shoulder, bending your elbow as much as you can. Then straighten your elbow as far as you can. Repeat 15 times and do 2 sets of 15.

Strengthening exercises

Eccentric wrist flexion: Hold a can or hammer handle in the hand of your injured side with your palm up. Use the hand on the side that is not injured to bend your wrist up. Then let go of your wrist and use just your injured side to lower the weight slowly back to the starting position. Do 3 sets of 15. Gradually increase the weight you are holding.

Eccentric wrist extension: Hold a soup can or hammer handle in the hand of your injured side with your palm facing down. Use the hand on the side that is not injured to bend your wrist up. Then let go of your wrist and use just your injured side to lower the weight slowly back to the starting position. Do 3 sets of 15. Gradually increase the weight you are holding.

Wrist radial deviation strengthening: Put your wrist in the sideways position with your thumb up. Hold a can of soup or a hammer handle and gently bend your wrist up, with the thumb reaching toward the ceiling. Slowly lower to the starting position. Do not move your forearm throughout this exercise. Do 2 sets of 15.

Forearm pronation and supination strengthening: Hold a soup can or hammer handle in your hand and bend your elbow 90 degrees. Slowly turn your hand so your palm is up and then down. Do 2 sets of 15.

Wrist extension (with broom handle): Stand up and hold a broom handle in both hands. With your arms at shoulder level, elbows straight and palms down, roll the broom handle backward in your hand. Do 2 sets of 15.

References

Svernlöv B, Adolfsson L. Non-operative treatment regime including eccentric training for lateral humeral epicondylalgia. *Scand J Med Sci Sports.* 2001 Dec;11(6):328-34.

Disclaimer

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AN ANATOMICAL AND PHYSIOLOGICAL VIEW OF TENNIS ELBOW

Anatomy

Tennis elbow is an inflammation of the common extensor tendon of the forearm. This tendon arises from the lateral epicondyle and serves as an anchor for four of the extensor muscles of the wrist.

1. *Extensor carpi radialis brevis*
2. *Extensor digitorum*
3. *Extensor digiti minimi*
4. *Extensor carpi ulnaris*

Also commonly involved is the supinator radii brevis, which also arises from the lateral epicondyle.

Physiology

Tennis elbow is an overstress phenomenon. The tendon, and at times the proximal muscle area, becomes inflamed because the athlete demands more from it than it is capable of giving.

The usual cause is hitting the backhand late with the elbow bent. This transmits excess shock and stress to the tendon. If the supinator is primarily involved, it is from cutting the serve to put spin on the ball.

Physical Exam

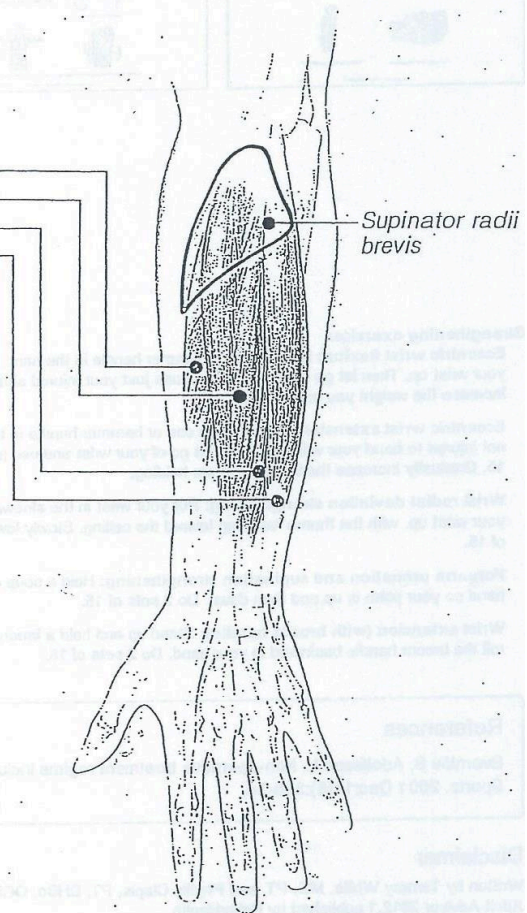
There will be point tenderness over the lateral epicondyle, which may extend down over the proximal muscle area on palpation. Pain is elicited by the following movements.

1. *Clenching the fist or squeezing the fingers.*
2. *Dorsiflexion of the wrist against resistance.*
3. *Supination of the wrist against resistance.*

Prevention

1. *Use a racquet that absorbs shock rather than transmits it. Compounds are better than metal. Wood is probably the best but is no longer available.*
2. *Reduce the tension of the stringing: the tighter, the more shock.*
3. *Don't use a racquet larger than midsize.*
4. *Correct your backhand.*
5. *Don't suddenly increase your playing time.*

Tennis is not the only activity that can cause this ailment. It is seen in golfers in the power arm and results from pulling the club through. It also can



occur in over use in daily activity, such as painting with a heavy brush or excessive use of a screwdriver

Much less commonly, tennis players will complain of medial pain (medial epicondylitis). This involves the flexors and pronators and comes from turning the wrist over too far in trying to put topspin on the forehand stroke.

Flexion and pronation against resistance will cause pain. However, the same exercise program as described for lateral epicondylitis will be effective.

DIAGNOSIS AND TREATMENT

In 90 percent of tennis elbow sufferers, the pain is at the point slightly below where the muscle origin attaches at the outer knob.

I can feel the tenderness. Touching the inflamed spot brings on pain. Next, I ask you to raise and bend your arm so that the hand touches the shoulder. It is the position you use should you flex your biceps. Straightening out your elbow brings on the pain at the elbow. With your elbow straight, I ask you to cock your wrist up. This is especially painful. Sometimes, I push gently against your hand as you attempt to cock up your wrist. This activates the muscles on the back of the forearm and pulls on the injured tendon. In my opinion, the pain produced with the elbow straight out and the wrist cocked up is the most reliable sign of tennis elbow. This duplicates the position your wrist is in as you make a backhand shot or try to pick up a heavy object.

I usually confirm the diagnosis with the "chair test." I ask you to pick up a light chair with the ailing arm. Most cannot. The pain is too great.

Finally, I take x-rays of the elbow. I am looking for bone chips or a bone tumor in the elbow, which sometimes causes pain only on the outer side of the elbow. While these cases are rare, they should be ruled out with x-ray. Most of the time, the x-rays are negative. Occasionally you will see a small calcium deposit approximately one-half an inch from the outer elbow bone. This is very much like the calcium deposit in the pitcher's elbow, but less frequent.

The best treatment for tennis elbow is rest. I do not have anything in my medical bag that can beat it. If you continue to play tennis, you will extend your injury.

Be careful not to use the affected arm. Avoid opening car doors, carrying a briefcase, or lifting milk cartons. Use the other hand. Daily use can interfere with healing. Ice the elbow twice daily for twenty minutes for two to three days. Then, start heat treatments twice daily for twenty minutes. I recommend two to three weeks of rest. The longer you wait, the better the chances that you will heal completely. It is only guess work. As far as I know, there is no scientific study on the healing process of this muscle origin. Take two aspirin with each meal. The aspirin reduces the inflammation and the pain.

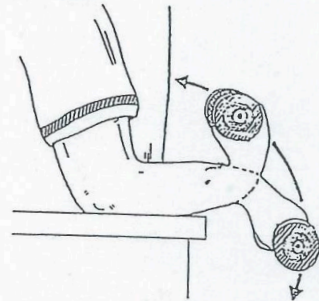
Tied with "rest" for the number one treatment in my book, is "go see a tennis coach." By learning to hit the ball with your whole arm instead of your elbow, you reduce the strain on the muscle origin. The Priest, Braden, and Gerberlich study found that 100 percent of those surveyed said that changing the tennis stroke was helpful treatment.

I have never had tennis elbow. But, I understand the problem. I am a squash player. When I have chased the ball into a corner and hit it only with the forearm muscles, I have felt the stress on the outer elbow area. I call it "coming up short." It

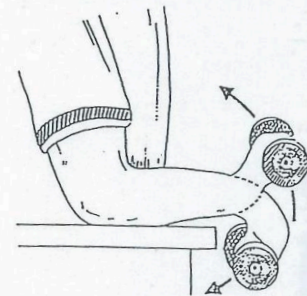
EXERCISES FOR TENNIS ELBOW

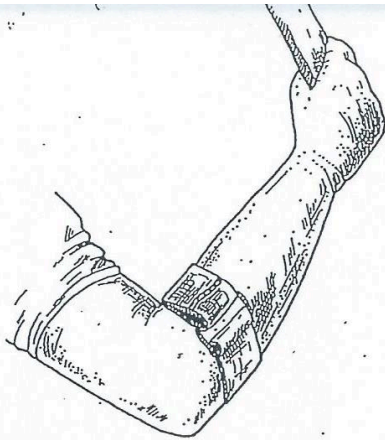
When you first develop pain in your elbow, stop playing tennis. After waiting two to seven days for the pain to disappear, start the following exercises. Perform each twice a day.

Lay your arm flat on a table, letting your hand extend over the edge, your palm facing up. With a five-pound weight, flex your wrist ten times. Do two more sets.



Lay your arm flat on a table, letting your hand extend over the edge, your palm facing down. With a five-pound weight, flex your wrist ten times. Do two more sets.





Tennis Elbow Strap

happens in tennis players who get caught at the net. The ball is smashed directly at their bodies; they cannot set themselves. They end up taking a half-swing. It is more instinct than anything else.

I have never treated a single tennis player who regularly stretches and strengthens the forearm muscles and tendons. Tennis players have not gotten the message yet—that the muscles damage slightly when they are stressed, and when they heal they are shorter. It is the same principle as a skin tear. The healing process draws the skin together. The drawing tightens the skin.

Most other athletes have the message. I have never been in the Boston Red Sox's clubhouse before a game when players were not stretching their muscles. Before marathons, I see prerace stretching.

For stretching and strengthening, I recommend wrist curls with a five-pound weight. Do not start them until the pain disappears. Perform them twice a day. It will take you ten minutes a day.

Personally, I do not stretch with weights just before playing squash or golf for a physiological reason. The weighted exercises make my muscles swell. I feel pumped up and I lose my touch. I recommend doing the curls at least two hours before playing. Ideally, it is best to do them first thing in the morning.

Always volley before you play. This allows the muscles to fill up with blood and become more pliable. The more pliable they are, the less likely they are to tear.

I always recommend the first three treatments: rest, tennis lessons, and stretching and strengthening. They are simple, painless, and they work.

Another such remedy is the tennis elbow strap, fitted with Velcro hooks. The hooks make it adjustable. It should be worn about one and a half inches below the outer knob on the forearm. It should be at least one and a half inches wide. The strap acts like a shock absorber. In the army, I learned that a tennis elbow victim could pick up a chair if he wore the strap. Without it, the pain was too great. After two weeks of wrist curls, you can return to tennis—with your tennis elbow strap.

The strap should not be made out of elastic material, because then it acts like a tourniquet, damming up the blood in the hand. As you play, loosen the strap. The exercised muscle swells with blood. The swelling varies from individual to individual. I have had very good results with the tennis elbow strap.

If all these treatments fail, I prescribe an oral anti-inflammatory medicine. The pills are taken three times a day with meals. It takes five days to reduce the pain. If the medication is going to be effective, it will happen within a two-week period.

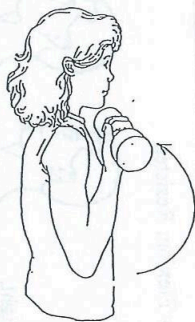
As a last resort, I inject cortisone into the muscle origin. This is the only tendon-like structure that I inject directly. I do it on the outer side near the tendon and bone. My reason: The

EXERCISE TREATMENT FOR TENNIS ELBOW

Developed by Allan M. Levy, M.D.

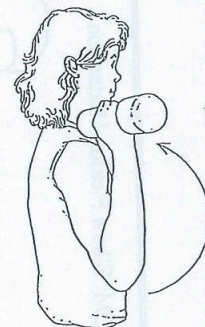
i. Arm Curl (Standing)

Hold a dumbbell with your palm facing forward and your hand at your side. Bend your elbow and lift the weight to your shoulder. Slowly lower the weight to the starting position.



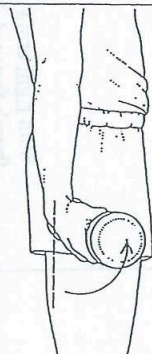
ii. Reverse Arm Curl

Hold a dumbbell with your palm facing backward and your hand at your side. Bend your elbow and lift the weight to your shoulder. Slowly lower the weight to the starting position.



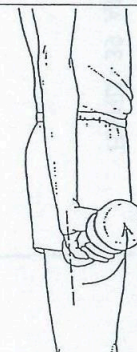
iii. Wrist Curl

Hold the dumbbell with your arm down by your side and your elbow locked. With your palm facing forward, flex the wrist forward all the way and then let it back down.



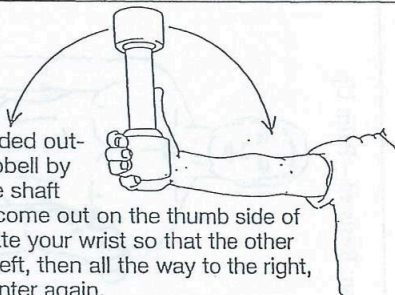
iv. Reverse Wrist Curl

Put your arm down by your side and turn your hand so that the palm faces backward. Holding the dumbbell, flex your wrist forward as far as it will go and then let it down.



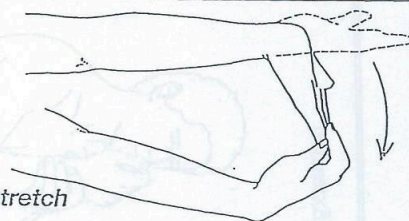
v. Unbalanced Wrist Rotation

With your arm extended outward, hold the dumbbell by one knob so that the shaft and the other knob come out on the thumb side of your hand. Now rotate your wrist so that the other knob rotates to the left, then all the way to the right, and then back to center again.



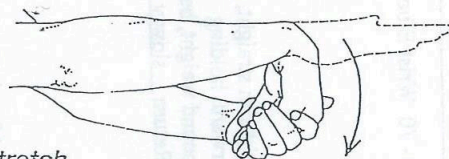
vi. Elbow Stretch (Palm Up)

Extend your arm straight out, that is, parallel to the floor with the elbow locked and palm facing up. With your other hand, push the palm and fingers of the extended hand toward the floor. Hold for 15 to 20 seconds.



vii. Elbow Stretch (Palm Down)

Extend your arm straight out, that is, parallel to the floor with the elbow locked and palm facing down. Push the top of your hand and fingers of the extended hand down toward the floor with your other hand. Hold for 15 to 20 seconds.



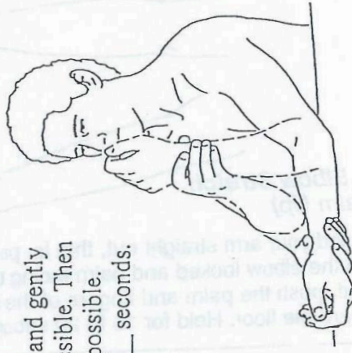
Exercises I - V should be done 50 times each, or to muscle exhaustion if this comes first. Start with 2-3 lb. dumbbell and increase weight as strength and pain allow. Try to work through pain unless it becomes severe.

Exercises VI & VII - 3-4 repetitions 6-8 times/day for each. Be sure elbow is completely straight to make stretch effective.

HAND - 38 PROM: Elbow Flexion / Extension

Grasp left arm at wrist and gently bend elbow as far as possible. Then straighten arm as far as possible. Hold each position 5 seconds.

Repeat 10 times per set.
Do 2-3 sets per session.
Do 1-2 sessions per day.



HAND - 39 AROM: Elbow Flexion / Extension

With left hand palm up, gently bend elbow as far as possible. Then straighten arm as far as possible.

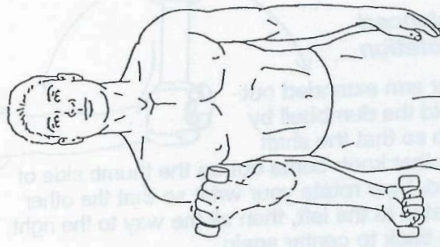
Repeat 10 times per set.
Do 2-3 sets per session.
Do 1-2 sessions per day.



HAND - 70 Wrist Elbow Flexion: Resisted - Palm Up

With right arm straight, palm forward, holding 2-5 pound weight, bend elbow. Return slowly.

Repeat 10 times per set.
Do 2-3 sets per session.
Do 1-2 sessions per day.



HAND - 67 Elbow Flexion: Resisted

With right arm straight, thumb forward, Holding 2-5 pound weight, bend elbow. Return slowly.

Repeat 10 times per set.
Do 2-3 sets per session.
Do 1-2 sessions per day.

