

# The surgical treatment of Tennis Elbow by small Incision with local anesthesia

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## Abstract

*Background:* When non-operative treatment of tennis elbow fails; a surgical procedure can be performed to improve the associated symptoms.

*Methods:* This manner was performed on 38 consecutive patients which treated surgically for lateral or medial epicondylitis. The indication for surgery was uncontrolled pain after six months of conservative treatment, more than 3 local injections of steroid and severe functional loss in occupational activities. The treatment results were assessed in terms of the pain using the visual analogue scale (VAS), Roles & Maudsley score, and Nirschl & Pettrone grade.

*Results:* in this study 38 patients of tennis elbow were involved, the preoperative VAS scores of pain were medium at rest 4.96, daily activity 5.96, and 7.6 at sports. After surgery, the VAS scores regulated significantly ( $p < 0.01$ ): 0.3 at rest, 1.53 daily activities, and 2.04 at sports. The preoperative Roles & Maudsley score was acceptable in 5 cases, and poor in 33 cases, which was changed to excellent in 22 cases, good in 14 cases, acceptable in 3 cases after surgery.

*Conclusions:* The surgical treatment of Tennis Elbow by small Incision with local anesthesia appears to be one of effective methods for intractable lateral or medial epicondylitis.

**Key Words:** Lateral and Medial epicondylitis, Local anesthesia, Small-open, Muscle resection.

**Aim:** The aim of this study was to investigate the clinical outcomes of surgical treatment for tennis elbow based on small incision.

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## Introduction:

Tennis elbow or lateral epicondylitis is the most common cause of chronic pain on the lateral side of the elbow and wrist extensor dysfunction, is the tendinosis of the common extensor origin (extensor carpi radialis brevis tendon) (1). The chief complaints in lateral epicondylitis are decreased grip strength, decreased functional activities and increased pain, which may impart significant disability in daily activities (12). Epicondylitis induce with activities requiring firm wrist stability, such as the backhand stroke in tennis, or repetitive work task that require repeated wrist extension, such as computer workers during computer keyboarding or gardeners during pulling weeds in a garden, in laborers (carpenters, plumbers), athletes (pitchers, javelin throwers, golfers, bowlers, weight lifters, and racket sports), as well as individuals that play recreational sports (2). Frequently affects the dominant extremity. Lateral epicondylitis was originally described by Major in 1883 as lateral elbow pain in tennis players (18). Peak incidence of lateral epicondylitis is between 1% and 3%. In a 2015 study published by the Mayo Clinic, the prevalence of lateral epicondylitis was noted to have decreased over the past 15 years; however, the recurrence rate remained constant at 8.5% within 2 years (19). Medial

epicondylitis occurs less frequently and may be associated with ulnar neuropathies or ulnar collateral ligament (UCL) injuries, which must be ruled out at time of diagnosis. lateral epicondylitis (tennis elbow) and medial epicondylitis (golfer's elbow) are the most common painful syndromes resulting from overuse of the elbow. Mechanical overload and repetitive stress on a tendon with a degenerative lesion are known to be the primary causes. Conservative measures using anti-inflammatory drugs, physical therapy (stretching and strengthening), counter force bracing, activity modification, wrist splint and local steroid injections (13) can be the preferred options in the early stages. However, they produce unsatisfactory outcomes that can lead to chronicity and a pervasiveness of the symptoms in many cases. In addition, considering that they are work-related disorders, the patients cannot avoid uncomfortable experiences at work due to pain and low work capacity. Therefore, a surgical approach is indicated for the treatment of lateral and medial epicondylitis in patients unresponsive to long-term conservative treatment. The currently available surgical options are open, percutaneous, and arthroscopic. The most widely used technique remains an open extra-articular approach to lateral epicondylitis, Basic principles include excision of pathologic tissue, decortication or drilling the lateral epicondyle, and repair of the extensor mechanism (16). Although Shin et al.(3) and Cho et al.(18) Reported the clinical outcomes of open surgery, there have been few domestic studies addressing the surgical treatment outcome compared to foreign studies. Moreover, these studies failed to provide information on the anesthesia, hospital stay, and size of the skin incision. In addition, there are very few reports on a mini-open muscle resection procedure under local anesthesia. This study evaluated the surgical outcome and efficacy of a mini-open muscle resection procedure under local anesthesia for lateral and medial epicondylitis in patients unresponsive to conservative treatment. Lateral epicondylitis, commonly referred to as "tennis elbow", affects 1-3% of adults in the United States each year (1). While a variety of treatment options exist, the majority of patients with this condition undergo conservative treatment prior to considering surgery, and approximately 90% of patients with lateral epicondylitis are treated successfully through non-operative methods (14).

## Methodology

The study consisted of 38 patients who were treated with surgical treatment by local anesthesia for lateral or medial epicondylitis. at The Nangarhar medical faculty and Nangarhar public health hospital's surgery wards which is started in 3/7/1395 and ended in 5/5/1397.

The research is designed as an analytical study. The study consisted of 26 females and 12 males. The mean age was 44.78 years (string, 30 to 75) and more than 50% of patients were aged between 37 - 75 years. 26 were right elbows and 12 were left elbows. The symptomatic elbow was on the dominant side except for 3 cases. 29 patients have lateral and 11 patients have medial epicondylitis. All patients were unilaterally affected except for 1 patient. the patients were divided according to mission, 16 were homewives, 20 were workers, 1 was catches in sports activities, and 1 was teacher. local steroid injections were administered before surgery. All patients were follow-up for 12.4 months (string, 11.12 to 23.17 months) post operatively. surgery indications included: more than 6 months of persistent symptoms

with conservative treatments. like rest, drug therapy, splinting, physiotherapy, and more than 3 steroid injections for treatment, and functional damage at work in the home.

The pain was assessed pre and postoperatively using a visual analogue scale (VAS: 0 = no pain, 10 = unendurance pain) at the rest, daily activities, sports or work. The preoperative and postoperative VAS scores were compared to determine the rectification in pain. The Roles and Maudsley score and the Nirschl and Pettrone's grading system) were used for the postoperative clinical assessment. According to the Roles and Maudsley score, the level of pain, joint movement, and activity were rated by four grades (excellent, good, acceptable, and poor). According to the Nirschl and Pettrone's grading system, excellent was defined as a full return to all activities without pain, good as a full return to all activities with occasional mild pain, fair as normal activity without pain, significant pain with heavy activity but an overall improvement in pain, and failure as no improvement in symptoms. Excellent and good results were considered satisfactory. Statistical analysis was performed using paired t-test on SPSS ver. 10.0. A p-value < 0.05 was considered significant.

**Results**

In this research 38 from 39 of tennis elbow patients were involved who were 26 females and 12 were males and mean aged were 44,78 (string 30-75) years old. The mean VAS score for pain at rest improved from 4.96 (string, 2.78 to 6. 48) preoperatively to 0.27 (string, 0 to 1.85) at the last follow-up (p = 0.006). The mean VAS score during daily activities improved from 5.96 (string, 2.78 to 7.41) preoperatively to 1.53 (string, 0 to 2.78) at the last follow-up (p = 0.001). The score during sports or work improved from 7.6 (string, 4.63 to 9.26) preoperatively to 2.04 (string, 0 to 4.63) at the last follow-up (p = 0.003). Overall, the level of pain improved significantly at rest, during daily activities and during sports or work.

Table 1: Comparison of the Pain Intensity Level Using a Visual Analogue Scale (VAS).

No	VAS	Preoperative	Postoperative	P – value
1	Rest	4.96	0.27	0.006
2	Daily activities	5.96	1.53	0.001
3	Occupational activities	7.6	2.04	0.003

Based on the Roles and Maudsley score, 5 and 33 patients showed acceptable and poor outcomes, respectively, before surgery. At the last follow-up, 22, 14, 2, and 0 were assessed as excellent, good, acceptable, and poor, respectively.

Table 2: Preoperative and Postoperative Roles & Maudsley Scores

No	Grad	Maudsley scores	Cases	
			Preoperative	Postoperative
1	Excellent	No pain ,full movement, full activity	0	22
2	Good	Occasionally discomfort, full move &activity	0	14
3	Acceptable	Some discomfort after prolonged activity	5	2
4	Poor	Pain limiting activity	33	0

Based on the Nirschl and Pettrone's grading system, 38 (97.43%) of the 39 cases had satisfactory results: 22 (57.89%) cases were excellent, 14 (36.84%) were good and 2 (5.26%) was fair with the exclusion of one patient with a fair result, most patients showed remarkable improvement in pain and could return to their original occupation within 2-3 months after surgery.

Table 3: Postoperative Nirschl and Pettrone Grades

No	Grad	Nirschl and Pettrone Grades	Case
1	Excellent	Full return to all activity with no pain	22
2	Good	Full return to all activity with mild pain	14
3	Fair	Normal activity with no pain , significant with heavy activity & 75% or better subject overall improvement in pain.	2
4	Failure	No relief of postoperative symptom	0

The postoperative complications included two patients of subcutaneous Seroma due to the leakage of joint fluid treated by insertion tube drainage and one patient have continuous pain Although the pain improved after surgery, in 3 patients were noticed the skin suture was removed, were managed with revision under local anesthesia.

**Discussion:**

If we compare the results of our research with the results of the research that was conducted in the General Research Fund of Clinical Medicine from Chungbuk National University hospital between February 2003 and June 2007. The study population consisted of 41 patients (42 cases) who were treated with a mini-open muscle resection procedure under local anesthesia for lateral and medial epicondylitis There were 28 females (29 elbows) and 13 males (13 elbows). The mean age was 47.5 years (range, 38 to 61) and more than 50% of patients were aged between 40 - 49 years. Twenty-eight were right elbows and 14 were left elbows. The symptomatic elbow was on the dominant side except for 4 cases. There were 32 and 10 cases of lateral and medial epicondylitis. All patients were unilaterally affected except for 1 patient. When the patients were divided according to occupation, 17 were housewives, 21 were laborers, 2 were involved in sports activities, and 2 were office workers. The mean duration of morbidity was 28 months (range, 8 to 10 years). An average of 4.2 (range, 2 to 10) local steroid injections were administered before surgery. The mean postoperative follow-up period was 13.4 months (range, 12 to 25 months).The indications for surgery were as follows: more than 6 months of persistent symptoms despite the aggressive conservative treatments, such as rest, drug therapy, splinting, physiotherapy, and a history of more than 3 steroid injections for treatment, and functional impairment at work and home. so there isn't so much difference between them. In our research which perform at The Nangarhar medical faculty and Nangarhar public health hospital's surgery wards is started in 3/7/1395 and ended in 5/5/1397, 38 patients from 39 of tennis elbow patients were involved who were 26 females and 12 were males and mean aged were 44,78 (string 30-75) years old. The mean VAS score for pain at rest improved from 4.96 (string, 2.78 to 6. 48) preoperatively to 0.27 (string, 0 to

1.85) at the last follow-up ( $p = 0.006$ ). The mean VAS score during daily activities improved from 5.96 (string, 2.78 to 7.41) preoperatively to 1.53 (string, 0 to 2.78) at the last follow-up ( $p = 0.001$ ). The score during sports or work improved from 7.6 (string, 4.63 to 9.26) preoperatively to 2.04 (string, 0 to 4.63) at the last follow-up ( $p = 0.003$ ). Overall, the level of pain improved significantly at rest, during daily activities and during sports or work.

Lateral and medial epicondylitis are syndromes that are characterized by local pain and tenderness over the elbow, which is the origin of the tendons that move the wrist and fingers. They are associated with housework, occupation and sporting activities, and cause great discomfort during daily activities. The cause of these syndromes is unclear but some suspected causes<sup>3, (4-8)</sup> are multiple ruptures at the origin of a muscle, bursitis, ossification at the origin of a muscle, synovial fold in the radio humeral joint, entrapment of the radial nerve, and degeneration of the annular ligament. Many surgical approaches have been introduced to deal with these causes.

With regard to the pathophysiology of epicondylitis, Cyrix (5) reported that tendinous changes occurred after the pathological healing of microscopic tears caused by repetitive and severe overuse, and Nirschl<sup>3</sup>) described it as ultimate ruptures of the tissues already affected by a circulation disturbance, nutritional changes, and overuse. It is believed that the overuse of degenerative tissues results in ruptures, as Nirschl (12) stated, and that the high morbidity among housewives in their 40s and 50s can be explained by this theory

Good results were obtained by performing a resection of the imperfect tissue after identifying the anatomical lesion at the origin of the common flexor through a small skin incision under local anesthesia has good results. In addition, this technic is less with postoperative pain, shorter hospital stay, and faster recovery and return to daily activities.

### **Conclusion:**

38 patients (97.43%) out of 39 elbows with medial or lateral epicondylitis, which were unresponsive to long-term conservative treatments, were managed successfully with small-open muscle resection technique under local anesthesia. Overall, it is believed that this procedure is an effective treatment option that reduces the time and expense required for conservative treatments, allays the patient's concerns regarding anesthesia, and promotes a rapid return to work.

### **Suggestions**

1. if you have tennis elbow, stop doing the activity that is causing pain, or find an alternative way of doing it that does not place stress on your tendons
2. avoid using your wrist and elbow more than the rest of your arm. Spread the load to the larger muscles of your shoulder and upper arm
3. if you play a sport that involves repetitive movements, such as tennis or squash, getting some coaching advice to help improve your technique may help you avoid getting tennis elbow
4. before playing a sport that involves repetitive arm movements, warm up properly and gently stretch your arm muscles to help avoid injury

5. use lightweight tools or racquets and enlarge their grip size to help you avoid putting excess strain on your tendons
6. wear a tennis elbow splint when you are using your arm, and take it off while you are resting or sleeping to help prevent further damage to your tendons. Ask your GP or physiotherapist for advice about the best type of brace or splint to use
7. increasing the strength of your forearm muscles can help prevent tennis elbow. A physiotherapist can advise you about exercises to build up your forearm muscles

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