

# Medium-term results after treatment of percutaneous tennis elbow release under local anaesthesia

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**Summary.** *Background:* The purpose of this study was to evaluate the results of the technique of percutaneous release of common extensor procedure under local anesthesia for lateral epicondylitis and to emphasize its simplicity. *Methods:* Forty seven elbows (41 patients) were treated surgically for lateral epicondylitis in the outpatient minor procedure room under local anaesthesia. The indication for surgery was continuation of symptoms (such as pain, movement and power loss) despite conservative treatment lasting more than six months. The treatment results were assessed using the visual analogue scale (VAS) and Mayo Elbow Performance Score (MEPS). *Results:* Twentysix right elbows and fifteen left elbows were treated surgically. Dominate elbow rate was 74%. The follow-up period was 36 to 72 months (mean 52 months). All patients had full range of motion. The average post operative pain score was 2.6(range 0 to 9).The average post operative MEPS score was 82 (range 40 to 100). ). Sixteen patients had excellent, twenty patients had good, two patients had fair and three patients had poor outcomes (repetitive problems). *Conclusion:* The percutaneous release of the common extensor origin is an important treatment option with minimal morbidity, safety, simplicity and good to excellent results in most patients. The procedure can be performed under local anaesthetic and leave a rarely visible scar. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** lateral epicondylitis, percutaneous release, common extensor origin, local anesthesia, the Mill's manipulation

## Introduction

The lateral epicondylitis (LE) or tennis elbow causes localized pain and dysfunction in the elbow. The first definition of lateral epicondylitis was performed by Runge in 1873 (1). The incidence of lateral epicondylitis is% 1-3 (2). It is most commonly seen in the fourth decade (2). The dominant side(right-handed or left-handed ) is affected in 75% of cases (3). Cyriax announced that the tennis elbow had 26 etiological factors (4). The most accepted cause is mechanical overload and recurrent stress on a tendon, causing microscopic tears with the formation of restorative tissue on the lateral epicondyle (3,5).

Lateral epicondylitis is often treated with conservative measures. Conservative measures included

oral anti-inflammatory agents, splints, local cortisone injections, local ultrasound and stretching extensor exercises. Surgery may be considered in patients with ongoing pain and weakness. There are various surgical techniques such as open or mini open, percutaneous and arthroscopic technique. Currently no technique has been shown to be better than others. Patient selection and the experience of the surgeon are two important elements to achieve good results. The percutaneous release of common extensor origin was first described by Loose (6,7). Yerger (8), and Powell (6) reported their experience with modifications of percutaneous.

The purpose of this study was to evaluate the results of the percutaneous release technique of the common extensor procedure under local anesthesia for lateral epicondylitis and to emphasize its simplicity.

## Materials and methods

This study was retrospective cohort study, was conducted on patients with lateral epicondylitis whom were treated by percutaneous release of common extensor origin (41patients, 47 elbows) from January 2015 to January 2018.

The indication for surgery was continuation of symptoms (such as pain, movement and power loss) despite conservative treatment lasting more than six months. Conservative treatments included three or more cortisone injections, splints, anti-inflammatory drugs, local ultrasound and stretching extensor exercises. Patients were discharged 1 hour after the operation. After the postoperative first day, wrist and elbow exercises were started in all patients.

In the study exclusion criterias were other elbow pathology such as RA, chondral or osteochondral lesions, localized skin problems, ligamentous instability and calcification on lateral epicondyle on X-ray.

In our clinic, percutaneous extensor tenotomy, open extensor carpi radialis brevis release and arthroscopic extensor carpi radialis brevis oscillation are performed in lateral epicondylitis surgery. We evaluated the results of percutaneous release of common extensor origin technique in our study. From January 2015 to January 2018 there were 57 patients with lateral epicondylitis were treated consecutively at our hospital. Patients were called by phone to check. 7 patients did not want to participate in the study because of their special problems. They had no complaints about their elbows. 50 patients agreed to come to control. 9 patients had elbow pathology were not included in the study. 41 patients with study criteria were included in the study. Patients' data were obtained from medical records. Ethics committee approval was not sought because this was a review study using a proven technique.

Periodic clinical examinations are performed to all patients at 2, 4, 6, 8 weeks and 6 months intervals after surgery. We asked the patients how long the pain had elapsed after the surgery. Pain level was measured by visual analog scale (VAS). The visual analog scale is a reliable and valid method for measuring perceived pain (9). Functional evaluation was performed with Mayo Elbow Performance Score (MEPS)(10).

## Operative Technique

Surgical technique was performed by experienced surgeon. The percutaneous release of the common extensor origin was performed in the outpatient minor procedure room under local anaesthesia( 4mls 40 mg lidocaine with 0.025 mg epinephrine) with the patient placed supine. A tourniquet was not used. An incision was made with a number 15 blade to the anterior of the lateral epicondyle (Fig. 1). The length of the skin incision is one centimeter. The common extensor origin was completely released by moving the tip of the knife from the lateral epicondyle anteriorly and inferiorly. The common extensor tendon was shifted distally with the manipulation of the Mill (The Mill manipulation is full extension of the elbow with full pronation of the forearm and full flexion of the wrist ) (Fig. 2). A one centimeter gap was created on the average. Skin was closed a single suture with using 4-0 monocryl. Early mobilisation was started. Wrist or elbow splint was not used.

## Results

From January 2015 to January 2018, 47 elbows in 41 patients were treated with percutaneous release. 19 of our patients were male and 22 were female. Fifteen patients were working in heavy lifting or repetitive ac-



**Figure 1.** An incision was made with a number 15 blade to the anterior of the lateral epicondyle



**Figure 2.** The Mill manipulation is full extension of the elbow with full pronation of the forearm and full flexion of the wrist

tivities and twelve of patients were housewives, others were sports injuries

Twenty-six right elbows and fifteen left elbows were treated surgically. Dominant elbow rate was 74%. The average age of the patients was 46 years with a range of 28 to 66 years.

The follow-up period was 36 to 72 months (mean 52 months). The mean time of return to daily activities was 2 weeks (1 day to 9 weeks). Patients returned to their previous activities without serious restriction. There were no post-operative complications.

The patients told us that the complete recovery time after surgery was an average of 8.2 weeks (range 6–13 weeks). The average post-operative pain score was 2.6 (range 0 to 9). The average post-operative MEPS score was 82 (range 40 to 100). Sixteen patients had excellent, twenty patients had good, two patients had fair and three patients had poor outcomes (repetitive problems). Scar of operation was rarely visible and had not tenderness or pain.

## Discussion

It is believed that lateral epicondylitis is usually caused by the repetitive mechanical load of the elbow. At one year, over 90% of patients recover with non-operative treatment. (12). However, new studies on patients with elbow complaints present a less favorable prognosis (13,14). Bot stated that 90% of all patients

had some improvement after 1 year follow-up, but only 34% of the patients recovered fully in 12 months (13). Surgery may be considered in patients with ongoing pain and weakness. The percutaneous release of the common extensor origin is an important treatment option with minimal morbidity, safety, simplicity and good to excellent results in most patients.

The percutaneous release of common extensor origin was first presented by Loose (6,7). Grundberg presented the results of percutaneous release of the elbow, which was excellent and good for 90.6% of the 32 tennis elbows (15). They operated under axillary block or general anesthesia in the operating room. Baumgard presented the results of a percutaneous release of 35 cases of tennis elbow (16). He found 91.4% of excellent and good results. He performed the operation in an outpatient room. We were performed in the outpatient minor procedure room under local anaesthesia. We found similar results to previous studies and found 87.8% excellent and good results.

The follow-up period of Karkhanis in the surgical treatment of tennis elbow was between 12 and 96 months (17). Verhaar said that long-term outcomes are needed to evaluate surgical success (18). Eirik showed that there was no significant difference between the outcomes of the short and medium follow-up period (19). Our follow-up time was similar and was 36–72 months with an average of 52 months.

The success rate of percutaneous extensor tenotomy, open extensor carpi radialis brevis release and arthroscopic extensor carpi radialis brevis release is 80–97% (20,21). It is unclear which procedure is best. Wilhelm proposed the complete release of the epicondylar region with decompression of the posterior interosseous nerve (22). Nirschl reported that a good or excellent result in 80% of patients. Nirschl study evaluated open surgery and degenerative tendon tissue removal (23). We found 12.2% fair and poor results. 4 patients with fair and poor results were heavy industrial workers, 1 patient with a fair result was a mother with 4 children. The reason for the poor and fair results in these patients is thought to be due to more mechanical overload and recurrent stress in the tendon. It is not yet clear which treatment is better for patients with poor and poor results. According to our opinion, it is important to inform the patients to be careful when performing daily

activities after the operation. The severity of the histologic reaction is not correlated with the clinical outcome (24). Currently, the removal of degenerative tendon tissue has not been shown to result in a better clinical outcome (25,26). Percutaneous release is a prominent method in the treatment because of low postoperative pain, short hospital stay and rehabilitation period and early return to daily activities. It is a simple safe procedure that can be performed in the outpatient minor procedure room under local anesthesia in patients who do not pass conservative treatments up (such as physical therapy, PRP and cortisone injections). Therefore, it should be the first treatment method to be applied before more complicated surgical treatments

The limitations of the retrospective study were also found in this study. Firstly, preoperative range of motion, VAS and MEPS scores of the patients were not found. This may result in insufficient clinical evaluation after surgical intervention. However, the surgical procedure was performed on patients with severe movement limitation and pain. Secondly, there was lack of randomisation or control group. In addition, the sample size was small.

## Conclusion

If non-surgical treatments do not improve symptoms, a surgical procedure should be performed. Which procedure is best is uncertain. The percutaneous release of the common extensor origin is an important treatment option with minimal morbidity, safety, simplicity and good to excellent results in most patients. The procedure can be performed under local anaesthetic and leave a rarely visible scar.

**Conflict of interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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