

Original Research Article

Outcome analysis of percutaneous tenotomy in chronic lateral epicondylitis elbow of greater than 6 months duration

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ABSTRACT

Background: Lateral epicondylitis elbow is a self-limiting condition with an unclear pathology. Conservative therapy is treatment of choice in lateral epicondylitis elbow but chronic lateral epicondylitis elbow (>6 month) is a condition difficult to treat. Percutaneous extensor tendon release can be a viable treatment option in such conditions.

Methods: This prospective study was conducted in 2016 to 2017 at the Department of Orthopaedics Surgery in a tertiary care institute. 30 patients were treated by percutaneous tenotomy. The outcome was assessed at follow ups using numerical rating scale (NRS), disabilities of the arm, shoulder, and hand questionnaire (DASH) and Oxford scores.

Results: 30 elbows were included in this study. They were managed by percutaneous method (PT; n=30). The mean age of patients was 41.74 years (range 26-67 years). Females were affected more than males in both groups (3:1). Dominant limb was involved in 86% of patients. 73% of females were house wives exposed to household chores and manual activities while 40% of males were manual workers. Mean hospital stay was 35 minutes (range 20-43 minutes). Patients were followed up at 3 month and 6 month post intervention. NRS, DASH, Oxford score assessment showed that all the scores were significantly decreased ($p < 0.05$) at 3 month and 6 month in patients undergoing percutaneous tenotomy.

Conclusions: Lateral epicondylitis >6 month duration is difficult to treat. Percutaneous tenotomy is effective modality of treatment in such conditions.

Keywords: Analgesics, Percutaneous tenotomy, Tennis elbow

INTRODUCTION

An overuse syndrome prevalent in fourth decade of life, lateral epicondylitis (tennis elbow) is the most common cause of elbow pain in patients attending the orthopaedic clinics. Pathology of condition is unclear, with a variety of conditions being used to explain its aetiology.¹ Most likely, a combination of mechanical overloading and abnormal microvascular changes in the extensor tendon origin esp. extensor carpi radialis brevis are known to

contribute to pathology of this condition. Disorganization of normal collagen architecture by invading fibroblasts in association with an immature vascular reparative response has been noted and termed as “angio-fibroblastic hyperplasia”.² Mostly tennis elbow responds well to conservative treatment involving rest and analgesics.³

Common treatment measures like activity modification, rest and physiotherapy are suggested to promote healing.

Still no standardized treatment is available for tennis elbow >6 month duration to promote healing and improve function. Tennis elbow >6 month duration is a distinct entity with an undefined management. The present study aims to evaluate percutaneous surgical release in this specific group of patients.

METHODS

This hospital based prospective study was performed at a tertiary care institute over a period of one year (2016-17). All patients who visited our department during above period with tennis elbow >6 mo. duration were included; while patients who refused consent, had previous elbow surgery or underlying elbow pathologies e.g., rheumatoid arthritis, osteoarthritis or radial tunnel syndrome were excluded from study. Patients were carefully evaluated by history and elbow examination. This included baseline numerical rating scale (NRS), disabilities of the arm, shoulder, and hand questionnaire (DASH) and Oxford elbow score measurements. Following these patients were treated by Percutaneous tenotomy (an outpatient department (OPD) based procedure). Patients were followed up at 3 month and 6 month interval and evaluated clinically and by using NRS, DASH and Oxford Score.

Surgical method

Percutaneous technique

After due consent and under local anesthesia, this OPD procedure was carried out placing limb in an attitude of flexion at elbow to protect the radial nerve. One-centimeter incision over the mid-point of the lateral epicondyle was given to reveal common extensor origin. A small pair of artery forceps was manoeuvred under the common extensor origin to visualize and divide it. The wrist was flexed to complete the defect and allow one cm gap at the cut common extensor origin. This gap was palpated to confirm the completion of procedure. The wound was closed in layers and local pressure applied to achieve hemostasis. All patients were advised postoperative mobilization of wrist and elbow many times a day in a sequence of; forearm in full pronation; full extension of elbow; wrist flexion and finger flexion (Figures 1-4).



Figure 1: Clinical pic lateral aspect of elbow showing landmarks.



Figure 2: Exposure of extensor tendon origin.



Figure 3: Tenotomy of extensor tendon near its origin.



Figure 4: Wound closure.

Outcome assessment

Outcome assessment was done at 3 mo. and 6 mo. follow ups using NRS, DASH score and Oxford elbow scores.

Statistical analysis

Data was entered in Microsoft excel sheet and statistically analysed using Epi-info version 7.2. Data were expressed as frequency, percentages or mean/standard deviation. The single group at different time interval was compared using paired t-test for quantitative variables. For categorical variables, chi-square test was used. Mann-Whitney test was used to compare non-parametric variables. A p value <0.05 was considered significant.

RESULTS

The present study aimed to prospectively evaluate percutaneous extensor tendon release in patients with tennis elbow >6 months duration. All patients had previously been exposed to irregular and intermittent conservative therapy in the form of rest and Nonsteroidal anti-inflammatory drugs (NSAIDs).

A total of 30 patients were treated by percutaneous tenotomy method (PT; n=30). The mean age of patients in was 41.74 years (range 26-67 years). Females were affected more than males in both groups (3:1). Dominant limb was involved in 86% of patients.73% of females were house wives exposed to household chores and manual activities while 40% of males were manual workers. Mean hospital stay was 35 minutes (range 20-43 minutes). Patients were followed up at 3 month and 6 month post intervention. Patients returned to normal activity in a mean period of 2 weeks. No complications were reported in both groups and all patients had full range of motion at elbow at follow ups.

NRS was used to assess pain at follow-up and compared with baseline. NRS was graded in 4 categories namely excellent, good, fair, and poor based on sum of scale score. At baseline, none of the patients were in excellent category in both groups, and four and one patient in CE and PT groups respectively present in poor category. Most of the patients were in good category. At 3 months, there were no patients in excellent and poor category while at 6 months, there were 12 patients in excellent category.

Table 1: Comparison of mean NRS score in patients with percutaneous tenotomy.

NRS	PT group (n=30)
Baseline	4.70±1.29
3 month	3.77±1.30
6 month	3.15±1.0
P value*	0.000

The DASH score was graded as excellent (0–25 points), good (26–50 points), moderate (51–75 points), or poor (76–100 points). Majority of the patients were in poor score category while none of the patients was in excellent

and good category at baseline. Number of patients increased to moderate category at 3 months and 6 months period (Tables 1-3).

Table 2: Comparison of mean DASH score in patients with percutaneous tenotomy.

DASH score	PT group (n=30)
Baseline	82.93±11.15
3 month	79.87±11.06
6 month	78.06±12.39
P value*	0.000

Table 3: Comparison of mean oxford score in patients with percutaneous tenotomy.

Oxford elbow score	PT group (n=30)
Baseline	32.53±2.93
3 month	34.13±2.98
6 month	35.87±2.30
P Value*	0.000

NRS, DASH, Oxford score assessment showed that all the scores were significantly decreased (p<0.05) at 3 and 6 months (Figures 5-7).

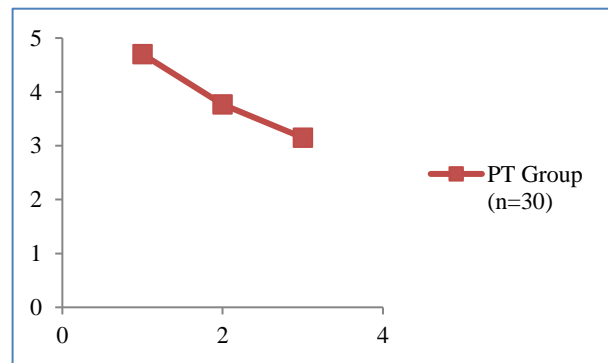


Figure 5: Mean NRS score at follow ups in patients with percutaneous tenotomy.

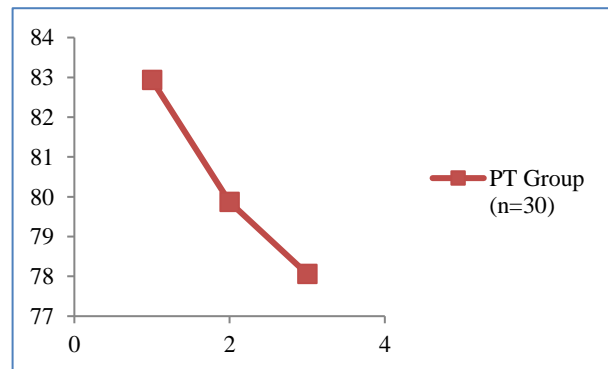


Figure 6: Mean DASH score at follow ups in patients with percutaneous tenotomy.

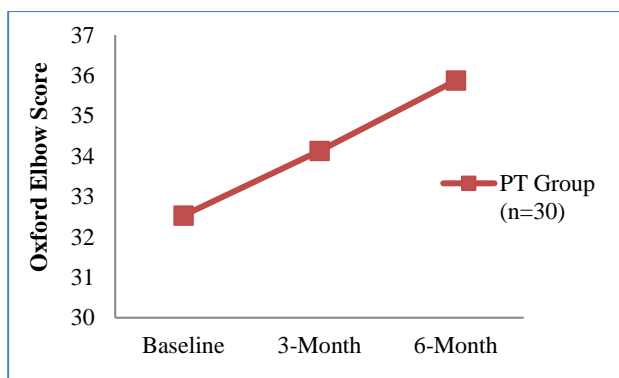


Figure 7: Mean Oxford score at follow ups in patients with percutaneous tenotomy.

DISCUSSION

Literature review mentions a variety of treatment options for tennis elbow which range from conservative therapy to operative treatment.¹ Surgical intervention can lead to early recovery and return to daily life activities. Extensor tenotomy with various variations has been used by various authors in recent past reporting good to excellent outcomes. Grunberg et al studied 32 patients of tennis elbow who were managed by extensor tenotomy using a 15 no blade. 90.6% of patients reported excellent and good results at 26 month follow up. 4 needle tenotomy [using 18 G needle] was used by some authors for treating tennis elbow in 17 patients and was reported as a very satisfactory procedure in office settings.⁵ Some others employed transverse sectioning of the intermuscular septum and the aponeurosis of the extensor carpi radialis brevis and extensor digitorum communis 3-5 cm distal to radial epicondyle in 49 patients and excellent results reported in 26 patients, percutaneous release with open technique in 45 patients revealed early return to work in percutaneous group.^{6,7}

In another study percutaneous common extensor origin release and drilling of lateral humeral epicondyle technique was used in resistant tennis elbow cases with excellent and good outcomes in (75%) and 18.75% patients respectively.⁸ Although at 3 and 6 month follow ups patients independently reported significant decrease in NRS, DASH and Oxford scores ($p < 0.05$), meaning thereby that patients had significant improvement in function post percutaneous tenotomy. Hence percutaneous tenotomy is a viable option in patients with lateral epicondylitis >6 month duration.

Strength

The strength of the study lies in the fact that it was a prospective hospital-based study where pre intervention scores were available and multiple scoring systems were used.

Limitation

The study has small sample size and a shorter follow up. Multicenter studies with large sample size and longer follow up are required.

CONCLUSION

The treatment of lateral elbow epicondylitis is frequently a self-limiting entity. In persisting lateral epicondylitis >6 month duration, the management is unclear and undefined. Percutaneous tenotomy is effective in managing tennis elbow (>6 months).

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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