ORIGINAL ARTICLE

Percutaneous needle tenotomy in the treatment of resistant lteral epicondylitis

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Abstract

Objective: To assess the outcome of percutaneous needle tenotomy in the treatment of resistant lateral epicondylitis

Study design: Descriptive study

Place and duration of study: Outpatient Department (OPD) of Orthopedics and TraumaQazi Hussain Ahmad Medical Complex Nowshera and Private clinics in Kohat, KPK, Pakistan from January 2016 to December 2017.

Materials and Methods: 20 patients with resistant lateral epicondylitis meeting the inclusion criteria were enrolled in the study. Each patient underwent percutaneous needle tenotomy of the common extensor tendon with 18G hypodermic needle under local anesthesia. Pre-procedure and post-procedure assessment at 12 weeks was doneusing VAS pain score and Nirschl stage.

Results: Out of 20 patients, 16(80%) patients were females and 4(20%) were males. Average age of the patients was 40.75years±8.03SD. In 17(85%) patients, right elbow was involved while in 3(15%) patients, left elbow was involved. Most of the patients (15, 75%) were in the age range of 30-50 years. Mean duration of symptoms was 31.85weeks±4.88SD. At 12 weeks, mean VAS pain score decreased from 8.05±1.36SD to 1.35±2.22SD while mean Nirschl stage decreased from 6.15±0.85SD to 0.95±1.63SD. There was statistically significant decrease in VAS pain score and Nirschl stage at 12 weeks (p-value <0.001). Treatment was successful in 70% (14) of patients (VAS pain score ≤ 2). Temporary pain at tenotomy site was reported by 2 (10%) patients. No case of hematoma formation or infection was reported. No patient was lost to follow up.

Conclusion: Percutaneous needle tenotomy for resistant lateral epicondylitis is easy, safe, effective and minimally invasive procedure which can be done at outpatient department. We recommend long-term comparative study to confirm our results.

Keywords: Percutaneous needle tenotomy, resistant lateral epicondylitis

Introduction:

Lateral epicondylitis/tennis elbow is the most common cause of lateral elbow pain presenting to orthopedic clinics. With the incidence of 1% to 3% in general population, it affects dominant extremity of both genders equally, usually in 4th and 5th decades.[1-3] It is commonly seen in patients with obesity, smoking, repetitive physical loading during work and intennis players.[4]

Thought to be a disorder of degeneration rather than an inflammatory process, it occurs most commonly in the tendon of the extensor carpi radialis brevis. However, extensor digitorum-communismay be involved.[5-8]

Lateral epicondylitis is diagnosed clinically, radiographs are only needed to exclude other elbow joint pathologies. Typically, there is lateral elbow pain, tenderness at the lateral epicondyle, normal elbow range of motion and positive cozen`s test.[9]

Treatment can be non-surgical and surgical. Non-surgical treatment includes rest, physical therapy, brace, oral NSAIDs, corticosteroid injections, autologous blood injections, laser therapy and extracorporeal shock wave therapy. Non-surgical treatment is effective in 90% of patients in relieving symptoms. Remaining 10% of the patients whofails to improve with non-surgical treatment are labeled as resistant or refractory cases.[10-13]

Resistant cases are usually treated with surgery which includes open, percutaneous or arthroscopic excision of the diseased tissue.[14,15] Percutaneous needle tenotomy with or without ultrasound assistance is minimally invasive technique that has gained popularity in recent years.[16-19]

Locally, literature is sparse on percutaneous needle tenotomy for resistant lateral epicondylitis. This study is conducted to assess the outcome of percutaneous needle tenotomy in the treatment of resistant lateral epicondylitis.

Material and Methods:

A total of 20 patients with resistant lateral epicondylitis were included in the study from January 2016 to December 2017 at Outpatient Department (OPD) of Orthopedics and Trauma Qazi Hussain Ahmad Medical Complex Nowsheraand Private Clinics in Kohat, KPK Pakistan.

The inclusion criteria were as follows; patients of either gender, aged >20 years with clinically diagnosed tennis elbow (lateral elbow pain, point tenderness to palpation, pain on resisted wrist extension in pronated forearm i.e. positive cozen`s test), duration of symptoms>24 weeks (6 months), VAS pain score greater than 4, patients not responding to conservative treatment modalities including steroid and autologous blood injections. The exclusion criteria were as follows; patients having pregnancy, rheumatoid arthritis, diabetes mellites, cervical radiculopathy, elbow arthritis/other concomitant elbow pathology, carpal tunnel syndrome, VAS score of less than 4, history of recent trauma and previous elbow surgery.

After approval of the hospital ethical and research committee, all patients meeting the inclusion criteria were informed about all the aspects of the procedure/study and written informed consent was taken. Detailed history, physical examination and x-rays the affected elbow anteroposterior and lateral views were performed for all the patients. Pre-procedure VAS pain score and Nirschl stage20 (table-1) were calculated for every patient.

Percutaneous needle tenotomy was performed using technique described by Kayastha N et al.[21] The patients were lying comfortably on a couch with their elbows flexed to 90^0 and fore-arm pronated. The point of maximum tenderness was marked and lateral aspect of the elbow was injected with 1% plain lignocaine after preparing the site with povidine-iodine solution. After local anesthetic has taken its effect, an 18G hypodermic needle was introduced through the skin to a reasonable depth at the previously marked site keeping the bevel of the needle parallel and close to the anterior surface of the lateral epicondyle. The bevel is moved about 200 up and down to divide the extensor origin. The needle is then removed and a saniplast dressing is applied at the tenotomysite. All the patients were kept in observation for an hour after the procedure. Patients were advised not to do strenuous activities and to use oral paracetamol for pain. All the patients were called for follow up at 12 weeks to calculate VAS pain score and Nirschl stage and examine for any complications. Treatment was considered successful if VAS pain score decreased to ≤ 2. SPSS version 21 was used for data analysis and p-value <0.05 was considered significant.

Results:

Out of 20 patients, 16(80%) patients were females and 4(20%) were males. Average age of the patients was 40.75years±8.03SD. Most of the patients (15, 75%) were in age range of 30-50 years (table-2). 3 patients (15%) were in age range of 20-30 years, 9 patients (45%) were in age range of 31-40 years, 6 patients (30%) were

Table-1: Nirschl Staging

Phase 1	Mild pain with exercise, resolves within 24 hours
Phase 2	Pain after exercise, exceeds 24 hours
Phase 3	Pain with exercise and doesn't alter activity
Phase 4	Pain with exercise and alter activity
Phase 5	Pain with heavy activities of daily living
Phase 6	Pain with light activities of daily living and intermittent pain at rest
Phase 7	Constant pain at rest, disturbs sleep

Table-2: Age range and gender of patients

Age range (Years)	Male	Female	Total	Percentage (%)
20-30	0	3	3	15
31-40	2	7	9	45
41-50	2	4	6	30
51-60	0	2	2	10
Total	4	16	20	100

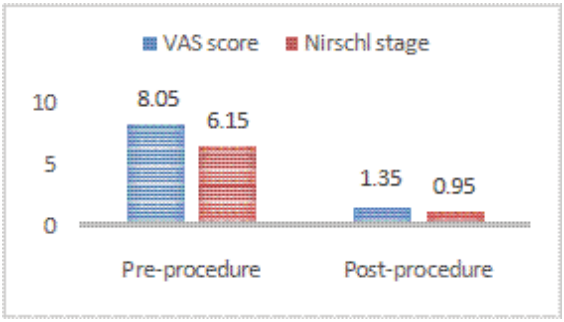

Figure-1: Mean pre-procedure and post-procedure VAS score and Nirschl stage at 12 weeks

in age range of 41-50 years and 2 patients (10%) were in age range of 51-60 years. In 17(85%) patients, right elbow was involved while in 3(15%) of patients, left elbow was involved. Mean duration of symptoms was 31.85weeks±4.88SD. 14 patients (70%) had severe(8-10) VAS pain scorewhile remaining 6 patients (30%) had moderate(5-7) VAS pain score. At 12 weeks, mean-VAS pain score decreased from 8.05±1.36SD to 1.35±2.22SD while mean Nirschl stage decreased from 6.15±0.85SD to 0.95±1.63SD as shown in figure-1. There was statistically significant decrease in VAS pain score and Nirschl stage at 12 weeks (p-value <0.001). Treatment was successful in 70% (n=14) of patients (VAS pain score ≤ 2). Temporary pain at tenotomysite was reported by 2 (10%) patients. No case of hematoma formation or infection was reported. No patient was lost to follow up.

Discussion:

In our study, females were more commonly affected by tennis elbow than males (female=80%, males=20%). Similar observations were made in other studies 4,[22] while Ozturan reported equal gender distribution of tennis elbow.[23] Average age of the patients was 40.75years±8.03SD while most of the patients (15, 75%) were in the age range of 30-50 years. This is similar to observations made by other authors.[24] In 17(85%) patients, right elbow was involved while in 3(15%) patients, left elbow was involved which goes with other studies in the literature.[24,25]

As stated before, about 10% of the tennis elbow patients fails to improve with non-surgical treatment and are labelled as resistant or refractory cases.[10-13] Resistant cases are usually treated with surgery which includes open, percutaneous or arthroscopic excision of the diseased tissue.[14,15] Percutaneous needle tenotomy with or without ultrasound assistance is minimally invasive technique that has gained popularity in recent years.[16-19] In our patients at 12 weeks follow-up, mean VAS pain score decreased from 8.05±1.36SD to 1.35±2.22SD while mean Nirschl stage decreased from 6.15±0.85SD to 0.95±1.63SD. There was statistically significant decrease in mean VAS pain score and Nirschl stage at 12 weeks (p-value <0.001). In the current study, treatment was successful in 70% (14) of patients (VAS pain score ≤ 2). Kayastha N et al[21] in their study on percutaneous needle tenotomy for lateral epicondylitis reported excellent outcome (no pain with full activity) in 36.7%, good outcome (occasional mild pain with full activity) in 43.3%, fair outcome (significant pain with full activity) in 16.7% and poor outcome (little or no relief of pre-procedure symptoms) in 3.3% of patients. Similar results were obtained by Lakheyet al.[16]

As stated previously, lateral epicondylitis results from degeneration of common extensor origin.[5,6] Tenotomy of the common extensor origin stimulates an acute inflammation in thedegenerative area of the tendon which expediates the healing process, thereby relieving the pain.[21] Furthermore, percutaneous tenotomy has added benefit of dry needling which is noval treatment in the management of painful musculoskeletal

disorders.[26] It is suggested that dry needling causes bleeding (blood contains platelets and various growth factors which help in tissue repair and regeneration)[27,28] into the tendon which increase inflammation and induce the release of various growth factors. This stimulate tendon healing.[29] Temporary increased pain attenotomy site was reported by 2(10%) patients. No case of hematoma formation or infection was reported. Kayastha N et al[21] reported tenotomy site pain in 3 patients, hematoma formation in 1 patient and local skin atrophy in 4 patients.

There were some limitations of our study. Sample size was small and there was a short follow up. Larger study with a longer follow upis recommended to more precisely know the outcome of percutaneous needle tenotomy in resistant lateral epicondylitis.

Conclusion:
Percutaneous needle tenotomy for resistant lateral epicondylitis is easy, safe, effective and minimally invasive procedure which can be done at outpatient department. We recommend long-term comparative study to confirm our results.

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Role and contribution of authors:
Dr Afsar Khan, conception and design of the study, collection/analysis/interpretation of data

Dr Yaqoob Ur Rehman, collection of data and drafting of the article

Dr Muhammad Zahid Shah, statistical expertise

Dr Abdus Samad Khan, final approval of the article

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