

TREATMENT OF MEDIAL EPICONDYLITIS WITH LOCAL INJECTION OF PLATELET RICH PLASMA

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ABSTRACT:

Introduction: Medial epicondylitis is commonly referred to as “golfer’s elbow,” and is characterized by pathologic changes to the musculo-tendinous origin at the medial epicondyle. Actually, epicondylitis is not an inflammatory process, but it is a tendinosis that results from tendon microscopic tearing, followed by an incomplete reparative response. Several treatment options are available as non-steroidal anti-inflammatory medications, physiotherapy, extracorporeal shock wave therapy, local steroid injections and more recently local injection of platelet rich plasma (PRP). Surgery reserved for resistant cases when the mentioned modalities fail.

Patients and method: This study included 27 patients presented to El-Hadara University Hospital with chronic symptomatic medial epicondylitis for more than 6 months. All cases received single local injection of PRP and followed up for 3 months after injection. Patients assessment was done using the VAS and DASH scoring system at the initial visit (before injection) and through the follow up period at 2 weeks, 6 weeks and 12 weeks.

Results: Local injection of PRP in cases of medial epicondylitis was a successful method of treatment. When the baseline VAS and DASH scores were compared with the scores at 3 months follow-up, the results showed significant improved across time.

Conclusion: local PRP injection significantly reduced pain and increased function in patients with chronic medial epicondylitis.

Key-words: Medial epicondylitis, platelet rich plasma, local injection.

INTRODUCTION

Lateral and medial epicondylitis are two of the most common causes of elbow pain that occur as a result of sporting and occupational activities. Histologically, it is considered as degenerative changes involving the tendon of the common flexor pronator origin rather than inflammatory changes. The term tendinosis is more accurate. It affects the dominant extremity twice as often as the non-dominant.^(1, 2)

Most patients with medial epicondylitis will improve with conservative treatment and time. The most successful regimens of conservative treatment include activity modification and avoidance of precipitating factors as repetitive activities related to work or sport. Other methods of conservative treatment include non-steroidal anti-inflammatory drugs (NSAIDs), ice, physical therapy and bracing. Corticosteroid injection may provide temporary relief for periods up to 6 weeks or more, but it doesn't alter the

natural history of the disease. Surgical treatment should be considered if symptoms persist beyond 6 months despite nonoperative treatment.^(3,4,5)

One novel treatment strategy is the use of local injection of platelet-rich plasma (PRP). Preparation of PRP involves centrifugation of autologous blood to separate and extract plasma and buffy coat portions of blood which contain high concentrations of platelets. The platelets may then be activated prior to injection by adding calcium and thrombin to saturate all platelet receptors. Alternatively, the platelets may be naturally activated after injection when it comes in contact with local tissues. These activated platelets then secrete a variety of growth factors which collectively promote the tissue-

Several studies have reported using local PRP injection to treat epicondylitis of the elbow and various other tendinopathies. However, considerable controversy remains about the effectiveness of local platelet-rich plasma injection, which in part may be due to differences in preparation, method of platelet activation, and experimental design, such as how long patients were unresponsive to conservative therapies.^(8, 9)

The goal of this study was to follow the outcome of a single local platelet-rich plasma injection in patients with painful medial epicondylitis not responding to conservative treatment

PATIENTS & METHODS

Informed consent was taken from each patient. The current study was a prospective randomized non-controlled study. It included 27 patients who suffered from chronic medial epicondylitis not responding to conservative treatment for more than 6 months. Patients presented to El-Hadara University Hospital between August 2015 and January 2016. All our patients received a single local injection of PRP and followed up for a period of 3 months after injection. Patients with history of anaemia (hemoglobin <7.0 g/dl), thrombocytopenia (platelets <150 × 10³ μL), bleeding dyscrasias or significant cardiovascular, renal and hepatic disease were excluded.

The mean age of the patients was 34.6±11.5 years (range 18-55 years). Of the 27 patients, there were 21 males (78%) and 6 females (22%). All the patients were right handed. The right side was involved in 23 patients (85.2%), while both sides were involved in four patients (14.8%). 51% of the patients were manual workers, 22.2% were housewives, 11% were office workers, 7.4% were athletes, and 7.4% were students. In 19 patients (70.4%), medial epicondylitis was not associated with any other pathology, while it was associated with symptomatic snapping ulnar nerve in 5 patients (18.5%) and lateral epicondylitis in 3 patients (11.1%).

The affected arm lied comfortably abducted and the forearm supinated. The region was disinfected. The most tender point was identified by gentle palpation (approximately one inch distal and radial to the medial epicondyle). The needle was inserted at 90 degrees down to the level of the bone and then pulled back 1 to 2 mm. With a 22 G needle, 2 to 3 ml of The PRP solution was injected via a peppering technique (single skin entry, partially withdrawing the needle, redirecting and making multiple penetrations to the common flexor tendon while injecting equal amounts of PRP). The injected platelets were activated on contact with tendon tissue.

After PRP injection, the patients were instructed to rest their elbow and wrist for 48 hours. Patients were allowed to receive acetaminophen for pain relief while the use of NSAIDs was strictly prohibited. Patients were instructed to avoid NSAIDs for 2 weeks prior to PRP injection as it inhibits the release of the important growth factors needed for the healing process.

The Visual Analogue Scale for pain (VAS) together with the Disability of Arm, Shoulder and Hand (DASH) score were used to assess the patients before injection (base line) and then at 2 weeks, 6 weeks and 12 weeks post injection. Visual Analogue Scale (VAS) measures the

amount of pain that a patient feels ranges across a continuum from none (0) to an extreme amount of pain (100).

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum) mean, standard deviation and median. Each patient was used as his or her own control. Paired t test was used to assess the amount of improvement at each follow-up visit as compared with the base line value. Chi-square test was used to test association of the presence of ulnar nerve symptoms and success of treatment. Significance of the obtained results was judged at the 5% level.

RESULTS

Initially (before injection), the patients had a mean DASH score of 57.72 and a mean VAS score of 72.65. Two weeks after injection, the DASH score decreased significantly by a mean of 13.3% (P <0.001) and the VAS score decreased significantly by a mean of 12.63% (P <0.001). Six weeks after injection, the DASH score decreased significantly by a mean of 27.56% in relation to the base line (P <0.001) and the VAS scores decreased significantly by a mean of 25.9% in relation to the base line (P <0.001). After 12 weeks, the DASH score decreased significantly by a mean of 44.9% (P <0.001) and VAS score decreased significantly by a mean of 53.97% (P <0.001). (Table1) (Fig. 1)

Definition of successful and unsuccessful treatment:

Reduction in DASH score by 25% or 25% Reduction in the worst pain score of the VAS was chosen as the primary objective measure of successful treatment after PRP injection⁽⁹⁾ According to this criteria, we had 8 (29.6%) non successful patients and 19 (70.4%) successful patients. All the patients that had associated lateral epicondylitis (3 patients) were successfully treated with PRP injection in contrast to only one of the 5 patients with an associated symptomatic ulnar nerve. There was a significant relation between associated ulnar nerve symptoms and failure of treatment (P = 0.034). Table (2)

There was no statistical significance association between the results and age, sex, occupation, side affected, dominant hand and previous treatment. The previous factors did not affect the improvement of the patients during every visits of follow up period.

Table (1): Comparison between DASH and VAS score changes at every visit in 27 patients

		DASH	VAS
Initial (base line)	Mean ± SD	57.72 ± 13.1	72.65 ± 12.9
	Mean ± SD	50.04 ± 12.26	63.47 ± 14.13
2 weeks	P*	<0.001*	<0.001*
	% of change in relation to the base line	↓13.3	↓12.63
6 weeks	Mean ± SD	41.81 ± 13.81	53.79 ± 18.07
	P*	<0.001*	<0.001*
	% of change in relation to the base line	↓27.56	↓25.9
12 weeks	Mean ± SD	31.75 ± 17.86	34.66 ± 29.49
	P*	<0.001*	<0.001*
	% of change in relation to the base line	↓44.9	↓53.97

p: value was calculated using paired t test, comparing with the base line value.

*: Statistically significant at p ≤ 0.05

Table (2): Relation between success of treatment and presence of associated ulnar nerve symptoms.

	Un Successful		Successful		χ^2	MC p
	No.	%	No.	%		
Associated Ulnar nerve symptoms						
No ulnar nerve symptoms (n=22)	4	18.2	18	81.8	7.46*	0.0063*
Ulnar nerve symptoms (n=5)	4	80.0	1	20.0		

χ^2 and p values for Chi square test for comparing between the two groups

*: Statistically significant at p ≤ 0.05

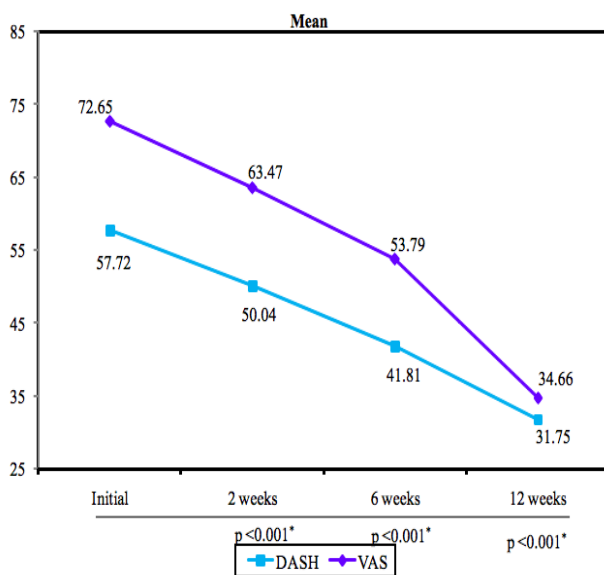


Figure (1): Changes in VAS and DASH scores with every visit.

COMPLICATION

No complications were reported at any time. There were no infections, neurovascular injuries, or worsening of the patients’ pain. The patient uses his own blood and this eliminates all kinds of potential complications as disease transmission and tissue rejection.

DISCUSSION

Chronic medial epicondylitis is a common problem with many available treatment options. Conservative treatment includes activity modification, rest, NSAIDs and physiotherapy. Local corticosteroid injections are given in acute situations and for cases unresponsive to other conservative methods. Corticosteroid injection offers a quick relief of pain but it has a limited role in chronic cases with high recurrence rate.⁽⁹⁾ Jobe and Ciccotti also concluded that of corticosteroid injection may result in

skin atrophy and permanent adverse effects within the tendon structure.⁽¹⁰⁾

Extracorporeal shock wave therapy also has gained popularity. A randomized double-blind study done in patients suffering from lateral epicondylitis showed that this treatment is not better than placebo.⁽¹¹⁾

It was estimated that 5-10% of patients with epicondylitis will need surgery. Surgical treatment of epicondylitis is generally associated with high success rates.⁽⁵⁾ However, the morbidity and costs of surgery argue against the surgical option if other options are available. Recently, PRP injection has been used to treat different orthopedic situations like epicondylitis, Achilles tendinopathies and plantar fasciitis. PRP contains a concentrated amount of platelets when injected into the site of tendinosis it promotes cellular chemotaxis, matrix synthesis, and fibroblast proliferation that increases tendon regenerative abilities.^(12,13,14)

Peerbooms *et al*, conducted a comparative study between PRP injection and corticosteroid injection in cases of lateral epicondylitis. They reported better outcome with PRP over a period of one year.⁽⁹⁾

The goal of our study was to evaluate the outcome of a single local injection of PRP in patients with painful medial epicondylitis after failure of conservative treatment for at least 6 months. This technique was successful in 70.4% of our patients (19 patients) (a 25% reduction in worst pain score for at least one follow-up visit). Worst pain scores were significantly better as early as the end of the first month after injection, suggesting a rapid healing response to PRP. The improvement continued through the out the period of follow up. However 29.6% of our patients (8 patients) were unsuccessfully treated and still had pain at the end of the follow up. They were scheduled for surgery.

Our study showed statistically significant improvement ($P < 0.05$) in DASH and VAS scores in consecutive follow up visits at 2 weeks, 6 weeks, and 3 months after injection. Initially (before injection), the patients had a mean DASH score of 57.72 and a mean VAS score of 72.65. Two weeks after injection, the DASH score improved by a mean of 13.3% and the VAS score improved by a mean of 12.63%. Six weeks after injection, the DASH score improved by a mean of 27.56% in relation to the base line and the VAS score improved by a mean of 25.9% in relation to the base line. After 12 weeks, the DASH score improved by a mean of 44.9% and VAS score improved by a mean of 53.97%.

This was similar to what was observed by Swamy and Mishra *et al*, in the medial epicondylitis group of their study. Initially (before injection), the patients had a mean VAS score of 78.8. Four weeks after injection, the VAS score improved by a mean of 26.7%. Three months after injection, the VAS score improved by a mean of 63.4% in relation to the base line.⁽¹⁵⁾ Mishra and Pavelko, in their

study of PRP injection for lateral and medial epicondylitis showed decreased VAS score from 80.3 (before injection) to 43.4 (4 weeks after injection) to 32.0 (8 weeks after injection) to 5.7 (6 months after injection).⁽⁸⁾ Contrary, Glanzmann and Audigé found that local PRP injections for medial epicondylitis didn't show a comparable benefit with that already reported for lateral epicondylitis. They reported a clinical improvement that was insignificant and their patients remained unsatisfied.⁽¹⁶⁾ However, this controversy in part may be due to differences in PRP preparation, method of platelet activation, and how long the patients were unresponsive to conservative treatment.

In our study, there was a strong association between the presence of associated ulnar nerve symptoms and treatment failure. 50 % of unsuccessfully treated cases had ulnar nerve symptoms and they were electrophysiologically free. Gabel and Morrey,⁽¹⁷⁾ classified medial epicondylitis according to the level of the associated ulnar neuropathy. They showed that the prognosis for Type II (associated ulnar nerve affection) medial epicondylitis was worse than the prognosis for Type I (no associated ulnar nerve affection), it is for this reason that careful diagnosis, and treatment of patients with ulnar nerve symptoms frequently determines outcome.⁽¹⁷⁾

Limitations of our study were the small number of patients and lack of a control group and the short period of follow up.

CONCLUSION

The results of this study suggest that PRP injection can relieve pain and improve function in patients with long-term medial epicondylitis who had failed conservative treatment. This technique was efficient in approximately 70.4% of affected patients at 3 month follow-up. PRP is simple to acquire and prepare and is also cost effective when compared with surgery.

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