Original Article

Improvement in Pain with Platelets Rich Plasma for Management of De Quervain's Tenosynovitis

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ABSTRACT

Objective: To assess the percentage improvement in pain with platelets rich plasma (PRP) for management of de Quervain's tenosynovitis.

Study Design: Descriptive Case series study.

Place and Duration of the Study: This study was conducted at the Department of Orthopedics, Sughra Shafi Medical Complex, Narowal from March 2019 to September 2019.

Material and Methods: A total of 96 patients who fulfilled the selection criteria were included. Demographic profile was obtained. Then, patients were given Intra-lesional PRP injection. Patients were followed-up in OPD for 30 days. After 15 days of first injection, 2nd injection was given and patients further followed-up till 30 days from inclusion. After 30 days, patients were evaluated for decrease in pain and improvement. Percentage improvement was noted.

Results: The mean age was 48.62±10.86 years. There were 54 (56.25%) males while 42 (43.75%) females. Left side was involved in 57 (59.38%) patients while in 39 (40.63%) patients, right side was involved. The mean duration of De Quervain tenosynovitis was 3.51±1.75months. At baseline, the mean pain score was 7.89±1.65. After treatment, the mean pain score was 3.77±2.09. There was significant decrease in pain score with PRP injections.

Conclusion: There is >50% decrease in pain with PRP injection in patients having moderate to severe pain of De Quervain tenosynovitis.

Key Words: De Quervain's tenosynovitis, platelets rich plasma, percentage improvement, pain score.

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INTRODUCTION

De Quervain's tenosynovitis is known to be a disease which is related to tendons of the 1st dorsal compartment of the wrist and is known to cause pain and functioning disability that could be refractory to conservative treatment options.[1] De Quervain's tenosynovitis was named after Swiss physician "de Quervain" who 1st detailed case series of 5 patients in 1895. Prevalence of de Quervain's tenosynovitis is calculated to be around 0.5% in males and 1.3% in females.[2]

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Clinicians are having an experience of above 100 years with this disorder whereas available treatment options are largely accepted without many disagreements. Not much difference in the diagnostic and treatment approaches are expected for this less prevalent but irritating disorder.[3]

Given the inherent nature of the tendon, new treatment like platelets rich plasma (PRP), autologous blood, and prolotherapy are thought to induce inflammation rather than suppressing it.[4] PRP treatment has been found to be effective for joint pain.[5] PRP injections are effective to treat chronic or acute joint pain. However, more trials are required to get confirmation of the evidence we have so far.[6] Another study reported that RP injection should be offered to all those with de Quervain's disease who failed with other conservative treatment options. Another study reported that in PRP-treated patients, an improvement of 55.1% was observed.[8]

It has been observed through literature that PRP injections are effective in reducing pain and thickening of tendons and avert the severity of disease.[6-8] But not much work has been done in this regard. Moreover, there is no local study found in literature in this regard. So to get the local evidence, we wanted to conduct this study to get authentic and reliable results so that we

may be able to implement the more successful method for management of de Quervain's tenosynovitis. The aim of this stud was to assess the percentage improvement in pain with platelets rich plasma for management of de Quervain's tenosynovitis.

MATERIALS AND METHODS

This Descriptive Case series was conducted at The Department of Orthopedics, Sughra Shafi Medical Complex, Narowal, from March 2019 to September 2019. Sample size of 96 cases was calculated with 95% confidence level, 10% margin of error and taking expected percentage of percentage improvement i.e. 55.1%[8] with PRP for management of de Quervain's tenosynovitis.

A total of 96 patients of age 30-70 years of either gender presenting with de Quervain's tenosynovitis were included. Patients with trauma (on x-ray), hemodynamically unstable (PT>15sec, aPTT>20sec), anemic (Hb<10mg/dl) or patient with recurrent de Quervain's tenosynovitis of same joint (medical record) were excluded from this study.

De Quervain's tenosynovitis was defined as presence of pain>4 (on VAS) within the first dorsal compartment at the wrist it causes pain during thumb motion on clinical examination.

All patients in this study were enrolled from OPD of Department of Orthopedic Surgery, Services Hospital, Lahore. An informed consent was obtained. Approval from ethical review board of the institution was taken for this study. Demographic profile (name, age, gender, BMI and duration of symptoms) was obtained from all patients. Then, patients were given Intra-lesional PRP injection. After 15 days of first injection, 2nd injection was given and patients further followed-up till 30 days from inclusion. After 30 days, patients were evaluated for decrease in pain and improvement. Percentage improvement was noted. All the information was collected through a specially designed proforma. Percentage improvement was measured as after treatment pain (measured at 30 days after the first injections) subtracted from baseline pain. Then divide the outcome on baseline pains score and multiply by 100 as follows:

$$\frac{\text{Baseline pain} - \text{after treatment pain}}{\text{Baseline pain}} \times 100$$

All the data was entered and analyzed through SPSS version 26.0. The quantitative variables like age and pain (at baseline and final visit) were presented as mean & SD. The qualitative variable like gender was presented as frequency and percentage. Mean percentage improvement was calculated. Data was stratified for age, gender, duration of symptoms, anatomical side and BMI. Post-stratification chi-square was applied. P-value ≤0.05 will be taken as significant.

RESULTS

In this study, we included 96 patients with the mean age of 48.62±10.86 years (ranging from 30 to 68 years). There were 53 (55.21%) patients of age 30-50years while 43 (44.79%) patients had age 51-70years. There were 54 (56.25%) males while 42 (43.75%) females (Table 1). The male-to-female ratio was 1.3:1. The mean height of patients was 1.67±0.12m (ranging from 1.46 to 1.90 m), mean weight was 69.71±6.87kg (ranging from 55 to 80 kg) and mean BMI was 24.60±3.30kg/m^2 (ranging from 20.05 to 32.70 kg/m^2). Left side was involved in 57 (59.38%) patients while in 39 (40.63%) patients, right side was involved (Table 1).

Table No.1: Characteristics of the Study Participants (n=96)

Characteristics		No (%)
Gender	Male	54 (56.2%)
	Female	42 (43.8%)
Age Groups (Years)	30-50	53 (55.2%)
	51-70	43 (44.8%)
Anatomical Side Involved	Left	57 (59.4%)
	Right	39 (40.6%)
BMI	Normal	56 (58.3%)
	Overweight or Obese	40 (41.7%)
Duration of Pain (months)	≤3	47 (49.0%)
	>3	49 (51.0%)
Baseline Pain Score (VAS)	5-7	34 (35.4%)
	8-10	62 (64.6%)

The mean duration of De Quervain tenosynovitis was 3.51±1.75 months (ranging from 1 to 6 months). At baseline, the mean pain score was 7.89±1.65 (ranging from 5 to 10). After treatment, the mean pain score was 3.77±2.09 (ranging from 0 to 8). There was significant decrease in pain score with PRP injections (p<0.05). The mean decrease in pain score was 0.55±0.22. There was 54.62±21.80% improvement in condition of patient (percentage decrease in pain score) after treatment with PRP injection (Table 2).

Table No.2: Comparison of Baseline and After Treatment Pain Scores (VAS)

		Baseline	After treatment	P-Value
Pain	n	96	96	<0.001
	Mean	7.89	3.77	
	SD	1.65	2.09	
	Minimum	5	0	
	Maximum	10	8	

Data was stratified for age of patients. In patients of age 30-50years, the mean percentage improvement was observed as 54.84±22.88% while in patients of age 51-70 years, the mean percentage improvement was observed as 54.34±20.65%. The difference was insignificant between both age strata (p>0.05), showing equal efficacy of PRP injection in all age groups.

Data was stratified for gender of patients. In male patients, the mean percentage improvement was observed as 60.96±23.84% while in female patients, the mean percentage improvement was observed as 46.46±15.66%. The difference was significant between both genders ($p<0.05$), showing more efficacy of PRP injection in male patients as compared to females.

There were 56 (58.33%) patients had normal BMI while 40 (41.67%) patient were overweight and obese. Data was stratified for BMI of patients. In patients with normal BMI, the mean percentage improvement was observed as 56.33±22.85% while in patients with overweight and obese, the mean percentage improvement was observed as 52.21±20.28%. The difference was insignificant between both side ($p>0.05$), showing no difference in PRP injection efficacy.

Data was stratified for anatomical side involved. In patients with left side involvement, the mean percentage improvement was observed as 49.35±19.49% while in patients with right side involvement, the mean percentage improvement was observed as 62.31±22.94%. The difference was significant between both side ($p<0.05$), showing more efficacy of PRP injection in right side as compared to left side.

Table No.3: Comparison of percentage improvement after treatment with respect to study variables

Percentage Improvement	Age (years)		P-Value
	30-50 (n=53)	51-70 (n=43)	0.912
Mean±SD	54.84±22.88	54.34±20.65	
Percentage Improvement	Gender		P-Value
	Male (n=54)	Female (n=42)	0.001
Mean±SD	60.96±23.84	46.46±15.66	
Percentage Improvement	BMI		P-Value
	Normal (n=56)	Overweight or Obese (n=40)	0.346
Mean±SD	56.33±22.85	52.21±20.28	
Percentage Improvement	Anatomical Side Involved		P-Value
	Left (n=57)	Right (n=39)	0.004
Mean±SD	49.35±19.49	62.31±22.94	
Percentage Improvement	Duration of Pain (months)		P-Value
	≤3 (n=47)	>3 (n=49)	0.1730
Mean±SD	51.51±19.26	57.59±23.80	
Percentage Improvement	Baseline Pain Score (VAS)		P-Value
	5-7 (n=34)	8-10 (n=62)	<0.001
Mean±SD	68.11±23.27	47.22±17.03	

There were 47 (48.96%) patients who had duration of pain ≤3months while 49 (51.04%) patients had duration of pain >3months. Data was stratified for duration of pain. In patients who had duration of pain ≤3months, the mean percentage improvement was observed as 51.51±19.26% while in patients who had duration of pain >3months, the mean percentage improvement was observed as 57.59±23.80%. The insignificant difference was observed ($p>0.05$), showing no difference whether pain is chronic or acute.

At baseline, 34 (35.42%) patients had moderate pain score (5-7) while 62 (64.58%) patients had severe pain scare (8-10). Data was stratified for baseline pain score. In patients with moderate pain score, the mean percentage improvement was observed as 68.11±23.27% while in patients with severe pain score, the mean percentage improvement was observed as 47.22±17.03%. The significant difference was observed ($p<0.05$), showing more efficacy of PRP in patients with moderate pain score (Table 3).

DISCUSSION

We noted male to female ratio to be 1.3:1. However, literature states that prevalence of de Quervain's tenosynovitis is calculated to be around 0.5% in males and 1.3% in females.[2,9] In our study, the mean pain score was 7.89±1.65, which was reduced to 3.77±2.09 after one month of treatment. Significant decline in pain score was noted after treatment with PRP injections. The mean decrease in pain score was 0.55±0.22. There was 54.62±21.80% improvement in condition of patient (percentage decrease in pain score) after treatment with PRP injection. Mishra et al noted PRP-treatment to result in an improvement of 55.1%.[8] The fact remains that very few trials having randomized protocols exist regarding effectiveness of PRP treatment and still there is no consensus.[10,11] One case presentation was published by Evan Peck where they adopted "ultrasound guided percutaneous needle tenotomy" and PRP injection for the treatment of de Quervain's Tenosynovitis.[3] In another study, the effectiveness of autologous whole blood injection for pain relief in lateral epicondylitis was evaluated subjectively via Nirschl and VAS scale. It was revealed that pain scores were reduced but there were no controls in that study to compare the outcome.[12,13]

Mirsha et al analyzed role of PRP in patients having chronic severe elbow tendinosis. Following 8 weeks of treatment, cases showed 60% improvement on VAS regarding pain in comparison to 16% among controls.[14] Regarding pain reduction, PRP treatment has been observed to be more effective and superior to autologous blood in the short term at 6 weeks.[15] Some researcher have also found more patients converting to surgery (20%) in autologous blood group in comparison to PRP group (10%) due to pain and disability issues.[16] The effectiveness of PRP compared with corticosteroid injections in patients with chronic lateral epicondylitis was determined in a study by Peerbooms et al. They found that regarding pain reduction and functional improvement, corticosteroids were better initially and then declined, whereas the PRP group progressively improved; however, this study also lacked a control group.[17] In a systematic review published in 2008,

Rabago et al, evaluated the results of five prospective case series and four controlled trials (three prolotherapy, two polidocanol, three autologous whole blood, and one PRP) for the treatment of refractory tennis elbow. The researchers compared a single treatment session of PRP with control injections, PRP subjects improved by a mean of 81% by 27 weeks. At 25.6 months, PRP patients further improved to 93% pain reduction compared with baseline.[18]

Based on the reported success of PRP injections for the treatment of certain tendinopathies, it may potentially be successful for the treatment of other tendinopathies, including de Quervain's tenosynovitis. For patients with de Quervain's tenosynovitis to conservative care, results of this study advocate that Intralesional injection of PRP may be a reasonable option to consider before surgery.

CONCLUSION

It was observed that PRP injections were effective in reducing pain and thickening of tendons and avert the severity of disease. The >50% pain was decreased with PRP injection in patients having moderate to severe pain of De Quervain tenosynovitis.

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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