

## ORIGINAL ARTICLE

## STUDY OF PLATELET RICH PLASMA INJECTIONS IN PATIENTS OF TENDINOPATHY IN SOUTH GUJARAT POPULATION

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## ABSTRACT

**Introduction:** Tendinopathy is a major medical problem associated with sports and physical activity in active people over 25 years of age. We study about the effect of PRP in the patients of chronic Tendinopathy.**Methods:** From the patients of chronic tendinopathy who failed medical treatment for last 3 months, platelet rich plasma is prepared from patient's own blood. After giving platelet rich plasma injection, patient is advised to take rest for 3 weeks with analgesics. Physiotherapy is started after 3 weeks of injection as this is causing pain for first 3 weeks. Patients are advised to join their duty after 3 weeks of injection. All the patients were followed up in OPD at 3 weeks, 6 weeks, 3 months and 6 months. At every follow up, range of motion, visual analogue scale and functional activity score recorded.**Results:** The follow up shows that most of the patients do not get relief within 3 weeks after injection. Follow up shows that 16 patients out of 50 got relief within 6 weeks after injection. Result shows that 46 patients out of 50 get relief within 6 months after injection. That means 94% of patients are having relief within 6 months of injection.**Conclusion:** The findings of this study shows that platelet rich plasma injection under ultrasound guidance at the tendon is effective mode of treatment for patients and takes time but result in gradual decrease in symptoms.**Keywords:** Chronic tendinopathy, platelet rich plasma

## INTRODUCTION

Tendinopathy is a major medical problem associated with sports and physical activity in active people over 25 years of age. It can be defined as a syndrome of tendon pain, localized tenderness, and swelling that impairs performance.<sup>1</sup> The clinical diagnosis is determined mainly through the history, although the exact relationship between symptoms and pathology remains unknown. In chronic tendinopathy, there is an increasing degree of degeneration with little or no inflammation present. Increasing age results in decline of the ultimate load of the muscle-tendon-bone complex, ultimate strain, as well as modulus of elasticity and tensile strength of the tendon. The application of PRP has been documented in many fields.<sup>2</sup> First promoted by M. Ferrari in 1987 as an autologous transfusion component after an open heart operation to avoid homologous blood product transfusion, there are now over 5200 entries in the NCBI for PRP ranging in fields from orthopedics, sports medicine, dentistry, otolaryngology, neurosurgery, ophthalmology, urology, wound

healing, cosmetic, cardiothoracic and maxillofacial surgery. We study about the effect of PRP in the patients of chronic Tendinopathy at Govt. Medical College, Surat

The objective of the study was to know the efficacy of platelet rich plasma in chronic tendinopathies like tennis elbow, golfer's elbow, supraspinatus tendinopathy, patellar tendinopathy, tendo achilles tendinopathy and plantar fasciitis and also to evaluate the outcomes of this recent modality of treatment for chronic tendinopathies. The objective was also to study advantages and complications of platelet rich plasma in tendinopathy and long term relief of pain in chronic tendinopathies.

## METHODOLOGY

This was a prospective study undertaken in the Department of Orthopedics Government Medical College, Surat. Patients with chronic tendinopathy came to New Civil Hospital, Surat included in the study after obtaining their informed consent and

Clearance from institutional ethical committee was obtained. The patients with not improved with medical treatment for last 3 months with or without physiotherapy included in the study.

A detail history was obtained for evaluating the mode of trauma, visual analogue score, chronicity, physiotherapy etc. Detail clinical examination and investigations were carried out before giving injection. The inclusion and exclusion criteria were as follows.

**Inclusion Criteria:** Patient with symptoms typical to Lateral and medial epicondylar tendinopathy, supraspinatus tendinopathy, tendoachilles tendinopathy, plantar fasciitis, patellar tendinopathy. Treated with diclofenac 100 mg twice a day or Ibuprofen 400 mg thrice a day or tramadol 100 mg twice a day and physiotherapy for more than 3 months but not improved

**Exclusion Criteria:** Any skin pathology at local site, Symptoms < 3 months duration, Patients who have taken chronic anti platelet therapy like in stroke, myocardial infarction etc., Patients having muscular dystrophy, Patients having more than one chronic tendinopathies.

After getting informed consent platelet rich plasma was prepared from patient's own blood. After giving platelet rich plasma injection, patient was advised to take rest for 3 weeks with analgesics. Physiotherapy was started after 3 weeks of injection as this was causing pain for first 3 weeks. Patients are advised to join their duty after 3 weeks of injection. The visual analogue scale and functional activity score is recorded just after giving injection.

All the patients were followed up in OPD at 3 weeks, 6 weeks, 3 months and 6 months. At every follow up, range of motion, visual analogue scale and functional activity score recorded. When the patient has started his/her duty, was recorded. Check for development of any complication. The data thus obtained was entered in a spread sheet and analysed using independent sample t test for quantitative variables, paired t test for paired observations and chi square test for categorical observations. Value of less than 0.05 was considered significance level and all the values below it was considered as statistically significant.

**RESULTS**

The mean age of study group was 38 years for the male. The mean age of study group was 40 years for the female. There was no significant difference between the age of males and females. Fifty percent of males and females belong to 31 - 40 years, 70% of males and females belong to 31 - 50 years. The chronic tendinopathy was more common in form of

tennis elbow and plantar fasciitis. 66% of patients are having plantar fasciitis and tennis elbow. Golfer's elbow was more common in males than females. In this study, patellar tendinopathy was not seen in females.

The follow up shows that most of the patients do not get relief within 3 weeks after injection. The mean of males who got relief within 3 weeks is 0.2 with standard deviation of 0.4. The mean of females who got relief within 3 weeks is 0 with standard deviation of 0. Only 1 patient of planter fasciitis got relief from pain at 3 weeks. Pain relief was considered when visual analogue scale of the patient decreased to at least 50% from preinjection visual analogue scale.

Follow up shows that 16 patients got relief within 6 weeks after injection. Patients with planter fasciitis, tennis elbow, golfer's elbow and patellar tendinopathy seem to get pain relief earlier as compared to patients with supraspinatus tendinopathy and tendoachilles tendinopathy. . Pain relief was considered when visual analogue scale of the patient decreased to at least 50% from preinjection visual analogue scale. At 12 weeks 37 patients out of 50 get pain relief is considered when visual analogue scale of the patient decreased to at least 50% from preinjection visual analogue scale.

Result shows that 46 patients out of 50 get relief within 6 months after injection. That means 94% of patients are having relief within 6 months of injection. Pain relief was considered when visual analogue scale of the patient decreased to at least 50% from preinjection visual analogue scale. It shows that all the patients with planter fasciitis, golfer's elbow, supraspinatus tendinopathy and patellar tendinopathy have relief from pain. But in tennis elbow 82% of patients had significant relief from pain and in tendoachilles tendinopathy 80% patients had significant relief from pain.

**Table 1: Distribution of patients returning to their work after injection**

Time	Male	Female	Total
Within 1 month	1	0	1
Within 2 month	14	2	16
Within 3 month	27	10	37
Within 6 month	32	14	46

Table 1 shows the duration returning to work by patients after injection. It shows that 74% of patients returned to their work after 3 months and 92% of patients within 6 months of injection. This table gives the idea regarding the relief of pain to the patients.

**Table 2: Distribution of patients as per VAS**

VAS	Preinjection	At 3 weeks	At 6 weeks	At 12 weeks	At 6 months
≥ 70	46	40	10	4	2
50 – 69	3	7	26	9	3
20 – 49	1	3	14	28	7
< 20	0	0	0	9	38
Total	50	50	50	50	50

**Table 3: Distribution of patients as per FAS**

FAS	Preinjection	At 3 weeks	At 6 weeks	At 12 weeks	At 6 months
2	46	43	18	6	2
1	4	7	31	38	16
0	0	0	1	6	32
Total	50	50	50	50	50

**Table 4 Quality of PRP Compared with Results**

Quality of PRP [increase in concentration compared to the baseline platelet count]	Cases	Result			
		Excellent	Good	Fair	Poor
< 3.5	15	04	06	03	02
3.5-5.5	30	28	2	0	0
>5.5	05	05	0	0	0

Table 2 shows Visual Analogue Scale (VAS) of patients having chronic tendinopathy. This table shows that pain is gradually decreasing over the time. Within 3 weeks only 10 patients got relief from pain, while within 6 weeks approximately 40 patients got relief. This suggest that Platelet Rich Plasma injection acts gradually over the time.

Table 3 shows Functional Activity Score (FAS) of patients having chronic tendinopathy. This FAS shows the routine daily activity carried out by a person. Table shows that within 3 weeks there is less improvement compare to 6 weeks. And at the end of 6 months almost all the patients can perform their daily activity smoothly.

This table suggest that quality of platelet count in platelet rich plasma has impact on the result. This table suggest that when the platelet count in platelet rich plasma injection is less than 3.5 times to the baseline level, 33% patients had fair to poor result. When the platelet count in platelet rich plasma injection is between 3.5 to 5.5 times to the baseline level, significant pain relief found in all patients. When the platelet count in platelet rich plasma injection is more than 5.5 times to the baseline level, all the patients have excellent result in chronic tendinopathies.

**Table 5 Distribution of patients as per the result**

Result	Male	Female	Total
Excellent	25	12	37
Good	6	2	8
Fair	1	2	3
Poor	1	1	2
Total	33	17	50

The Visual Analogue Scale is less than 20 then the result is excellent; if VAS is between 20 to 49 then the result is good; if VAS is between 50 - 69 then the result is fair and if VAS is greater than 70 then the result is poor.

Table shows the result of patients after 6 months of treatment. Table shows that 90% of the patients got excellent to good results with significant relief in pain; 6% of the total patients had fair result where as 4% of the total patients had poor result with minimal relief in pain.

31 male patients were having significant pain relief out of 33 patients and 14 female patients were having significant pain relief out of 17 females. So in male 94% of patients having pain relief as compared to female which is 82%. There were no major complications observed in the study apart from local pain at injection site. Also there was no side effect to patients due to this treatment.

## DISCUSSION

The mean age of the study group in male was 38 years with a standard deviation of 9.7 years. The mean age of female was 40 years with a standard deviation of 9 years. This study is almost comparable with Volpi et al in which the mean age of the study group was 40 years in male and 39 years in female. This study is also comparable with Mishra and Pavelko et al having mean age of 41 years in male and 42 years in female.

In this study, the duration of follow up examintaion is of 6 months which was comparable to Thanasses et al and Ferrero et al study. But in Volpi et al and

Mishra and Pavelko et al study are having follow up period of 2 years.<sup>3,4</sup>

In this study, pain and function improvement were found at 8 weeks after injection. So this study is comparable to Mishra and Pavelko et al and Volpi et al in which pain and functions were improved at around 8 weeks of injection. But in Ferrero et al study, improvement in pain occurs at around 3 weeks and in Thanasses et al study, pain improvement was found at 6 weeks.<sup>5</sup>

Mishra and Pavelko noted the significant improvement in PRP group for pain at 8wk and at 24months, 93% in VAS score and function . Thanasas noted significant improvement in VAS at 6 weeks. Volpi noted improvement of symptoms in 80% of patients. Hechman noted that PRP improves function and pain obviating the need for surgery.<sup>6</sup>Rha noted the improvement in pain and function after 3 months of injection.<sup>7</sup>Barret and Erredge noted that 77.8% of patients were

successfully treated. Six patients achieved complete resolution of pain within 2 months.<sup>8</sup> In this study significant improvement was found in pain and function in 80% of patients at 8 weeks. In all the above studies, PRP injection was given under ultrasonography guidance except in Mishra an Pavelko study and Hechmen study. Though the PRP injection was given at the precise site under ultrasonography guidance, it had similar result as compared to PRP injection which were given blindly in other studies.

**Table 6: Comparison Mean age in different Studies**

Study	Mean age	
	Male	Female
Volpi et al	40	39
Mishra and Pavelko et al	41	42
This study	38	40

**Table 7: Comparison of studies of platelet rich plasma in chronic tendinopathies**

Study	Indication	Follow up period	Outcome
Mishra and Pavelko et al	Chronic Tennis Elbow	2 years	Significant improvement in PRP group for pain at 8wk and at 24months +93% in VAS score and function
Thanasas et al	Chronic Tennis Elbow	6 months	Significant improvement in VAS at 6 weeks
Volpi et al	Golfer's Elbow Chronic Tennis Elbow Golfer's Elbow	2 years	Improvement of symptoms were found in 80% of patients
Hechman et al	Patellar Tendinopathy Tendoachilles Tendinopathy	6 months	PRP improves function and pain obviating the need for surgery
Rha et al	Chronic Tennis Elbow Golfer's Elbow	6 months	Improvement in pain and function after 3 months of injection
Barret & Erredge	Supraspinatus Tendinopathy Plantar Fasciitis	12 months	77.8% of patients were successfully treated. Six patients achieved complete resolution of pain within 2 months
This Study	Tennis Elbow Golfer's Elbow Plantar Fasciitis Patellar Tendinopathy Tendoachilles Tendinopathy Supraspinatus Tendinopathy	6 months	Significant improvement in pain and function found in 80% of patients at 8 weeks

In this study, 74% of patients were able to return to their work at around 10-12 weeks of injection; 92% of patients were able to return to their job within 6 months. In 80% of patients, pain reduced significantly within 8 weeks and in 92% of patients pain reduced within 6 months of injection.

**CONCLUSION**

The findings of this study show that platelet rich plasma injection under ultrasound guidance at the tendon is effective mode of treatment for patients with chronic tendinopathies. This suggest that

platelet rich plasma injection takes time to act and this will result in gradual decrease in symptoms. Platelet rich plasma is very effective in treatment of chronic tendinopathies. So, one should consider this treatment before going to surgical treatment for chronic tendinopathies. One of the limitations was that the study was carried out with 6 months of follow up only; long term results and follow up would have been ideal. Also the sample size could have been larger so that it could be applied over the population and comparing it with another modality of treatment for chronic tendinopathy. This study aids to the current knowledge of administration of PRP injection in orthopedics.

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