



# International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958  
P-ISSN: 2706-6630  
IJOS 2021; 7(4): 34-36  
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[www.orthopaper.com](http://www.orthopaper.com)  
Received: 26-07-2021  
Accepted: 12-09-2021

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## Tennis elbow treatment with platelet rich plasma: A prospective study

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**DOI:** <https://doi.org/10.22271/ortho.2021.v7.i4a.2863>

### Abstract

**Introduction:** Tennis elbow treatment is still remains a difficult task; the use of platelet-rich plasma (PRP) is a proactive therapeutic option that jump starts the healing process, which contains several different growth factors and other cytokines that stimulate healing of bone and soft tissue.

**Materials and Methods:** This is a prospective study of 50 patients, done at GEMS and hospital, Srikakulam, India, for 2 years. The primary analysis included visual analog scale pain scale, for measuring pain in patients, local tenderness, pain on extension of the wrist, grip strength, elbow swelling were clinically assessed at different interval of follow-up, clinical and functional outcome were evaluated at final follow-up with statistics.

**Results:** Results were calculated based on descriptive statistics with SPSS version 19. The average follow-up was 1.5 years. Results were excellent in 40, good in 6, fair in 1 and poor in 3. In two cases, there was superficial infection seen; in one nerve palsy; in three subjects pain worsened; and ended up in surgical intervention.

**Conclusion:** Treatment with PRP holds promising results with minimal risk for the treatment of Tennis elbow. A more scientific evidence studies need to done before we can determine whether PRP therapy is effective in other conditions. PRP therapy as a viable procedure that may decrease the progression of more injuries may decrease the overall time for healing, and therefore, may setback the overall need for surgical intervention.

**Keywords:** Platelet-rich plasma, tennis elbow, visual analog scale

### Introduction

Tennis elbow is due to cumulative micro trauma from repetitive wrist extension and alternating pronosupination of forearm with angiofibroblastic degeneration of the common extensor origin<sup>[1]</sup>. Ultrasound therapy, extracorporeal shock wave therapy, laser therapy, autologous blood injection, and platelet-rich plasma (PRP) have been in use for tennis elbow treatment. Tennis elbow treatment is still unsolved; the use of PRP is a proactive therapeutic option which jumpstarts the healing process, which contains several different growth factors and other cytokines that stimulate healing of bone and soft tissue<sup>[2]</sup>. In the current study, we report long-term follow-up of tennis elbow treated with PRP and analyze the efficacy.

### Materials and Methods

The study was conducted at GEMS, Srikakulam. Patients between 20 and 50 years of age who had positive clinical tests (Thomson's and Cozen's test) were included in the study. Patients with arthritis of elbow, cervical spine pathology, infection, myositis, previous elbow trauma, previous steroid injection, or surgical intervention were excluded from this study. About 30 ml of the patient's blood was collected<sup>[3]</sup>. The blood sample is placed in a centrifuge to separate the PRP from the other components of whole blood. PRP was injected into the site of the maximum tenderness. Patients were asked to rate their pain according to visual analog scale (VAS). All cases were protected with brace initially and given anti-inflammatory agents for 1 week with cold fomentation, and then restoration of normal daily activities were allowed from the 3<sup>rd</sup> week with stretching and physiotherapy<sup>[4]</sup>.

The primary analysis included VAS<sup>[5]</sup> for measuring pain inpatients, local tenderness, pain on extension of the wrist, grip strength, elbow swelling were clinically assessed at different

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interval of follow-up, clinical and functional outcome were evaluated at final follow-up with statistical analysis. Patients were assessed after 1 week, 3 weeks, 2 months, 4 months, 6 months, and 12 months. Results were calculated based on descriptive statistics with SPSS version 19.

## Results

This series consisted of 50 patients of whom 32 were males and 18 were females with age range from 20 to 50 years. The average follow-up was 1.5 years. Results were excellent in 40, good in 6, fair in 1 and poor in 3. In two cases, there was superficial infection seen but subsided with oral antibiotics and did not require any surgical intervention; in one case nerve palsy which eventually recovered fully without any intervention; in three cases pain worsened and landed up in surgical intervention and subsequent pain relief. The mean VAS decreased continuously and significantly up to 9 months (Figure 2).

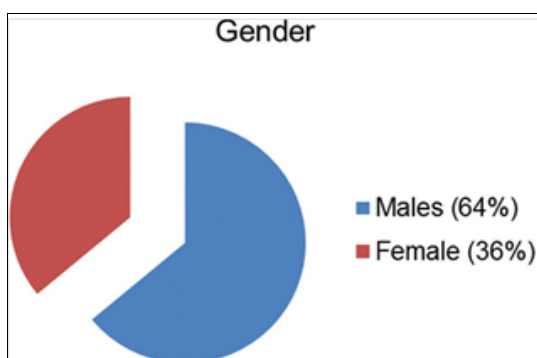


Fig 1: Gender Distribution

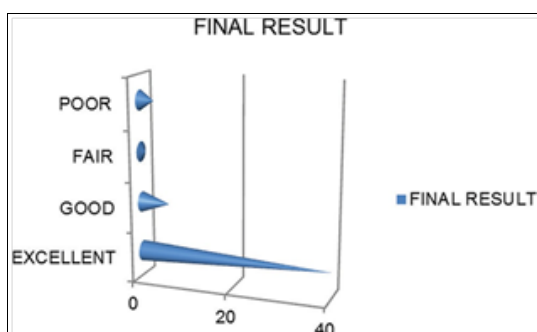


Fig 2: Depicting Final Results

## Discussion

Tennis elbow is a frequent cause of disability. There are many treatment options available, suggesting no single procedure is effective in this condition. Common treatment is physiotherapy, immobilization, and steroid injection [6].

This treatment is with a high frequency of relapse and recurrence. This is due to intraregional steroid injection leads to permanent changes within the structure of the tendon and due to overuse of the arm after injection as a result of direct pain relief [7]. Ultrasound therapy also has gained popularity. In a short-term study, using whole blood, Edward, and Calandruccio [7] reported 78% good results in treating tennis elbow with the requirement of multiple injections.

The use of PRP is a proactive therapeutic option which jumpstarts the healing process, which contains several different growth factors and other cytokines that stimulate healing of bone and soft tissue [8, 9]. Klein *et al.* [10] supported this thought with *in vitro* data, reporting transforming growth factor beta significantly increases Type I collagen production

in tendon sheath fibroblasts.

In other study for chronic elbow tendinosis PRP injection showed 93% excellent results when compared to pre-injection status [11].

The PRP has got potential to regenerate bone and soft tissue function and details of which is still a mystery.

PRP after injecting to the pathological site gets activated by collagen from the surrounding soft tissue, releasing growth factors, and cytokines [12]. These bioactive proteins and amino acid chains in turn stimulate local stem cells and enhance extracellular matrix gene expression, following which reparative cells from the vascular tissues and bone marrow then occurs.

PRP has the potential to inhibit inflammation, apoptosis, and metalloproteinase activity. This results in restoration of soft tissue and structural component, which can withstand stress and strain, hence a reduction in pain.

The molecular afferent or efferent receptors are altered with PRP and modulation occurs in the microvascular level of soft tissues [13]. further, more detailed study needs to be done to know the exact action pathway of PRP.

In this study mean VAS scale decreased statistically up to 9 months except immediate and 1 week ( $P < 0.05$ ). It was observed the pain was a higher post injection and later started decreasing drastically further.

## Conclusion

Treatment with PRP holds promising results with minimal risk for the treatment of Tennis elbow. More scientific evidence studies need to be done before we can determine whether PRP therapy is effective in other conditions. PRP therapy as a viable procedure that may decrease the progression of more injuries may decrease the overall time for healing, and therefore may setback the overall need for surgical intervention.

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