

# Efficacy of Autologous Blood Injections plus Dry Needling in Refractory Tennis Elbow

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## ABSTRACT

**Objective:** To assess the efficacy of autologous blood injections plus dry needling in refractory tennis elbow

**Study Design:** Descriptive study

**Place and Duration of Study:** Department of Orthopaedic, MTI Khyber Teaching Hospital, Peshawar, KPK, Pakistan from July 2016 to June 2018.

**Materials and Methods:** Thirty four patients with refractory tennis elbow meeting the inclusion criteria were enrolled in the study. Each patient was subjected to 2ml of autologous blood injection plus dry needling at the point of maximal tenderness of the affected elbow. Pretreatment and post-treatment assessment was done at 4 weeks, 8 weeks and 12 weeks using VAS pain score and Nirschl stage.

**Results:** Out of 34 patients, 24 (70.59%) patients were females and 10 (29.41%) were males. Mean age of the patients was 38.76 years  $\pm$  6.96 SD. In 27 (79.41%) patients, right elbow was involved while in 7 (20.59%) patients, left elbow was involved. Most patients (n= 26, 76.47%) were in the age range of 30-50 years. Mean duration of symptoms was 15.73 weeks  $\pm$  3.02 SD. Mean VAS pain score and mean Nirschl stage, both pre-treatment and post-treatment at 4, 8 and 12 weeks were calculated. There was statistically significant decrease in mean VAS pain score and mean Nirschl stage at 12 weeks (p value < 0.05). No local or systemic complication was noted. There was no loss to follow up.

**Conclusion:** Autologous blood injection plus dry needling is effective in the treatment of refractory tennis elbow. We recommend long term comparative study to confirm the results.

**Key Words:** Autologous blood injections, Dry needling, Refractory tennis elbow

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## INTRODUCTION

Lateral epicondylitis/tennis elbow is the most common cause of lateral elbow pain. Its incidence is 1% to 3% and is more common in general population than in tennis players. It is usually seen in 4<sup>th</sup> and 5<sup>th</sup> decades and equally affects in both genders<sup>1,2</sup>. It is commonly seen in patients with obesity, smoking, repetitive physical loading during work and in tennis players<sup>3</sup>.

Primarily it is a disorder of degeneration in the common extensor origin and not an inflammatory process<sup>4</sup>. It occurs most commonly in the tendon of the extensor carpi radialis brevis<sup>5</sup>. However, other tendons of the extensor bundle such as extensor digitorum communis, may be involved<sup>6</sup>. With repetitive work, there are microtears in the common extensor origin followed by hemorrhage, formation of granulation tissue and finally repair process<sup>7</sup>.

Diagnosis of tennis elbow is made on clinical grounds, radiographs are only needed to exclude other elbow joint pathologies. The typical presentation is lateral elbow pain, tenderness at the lateral epicondyle, normal elbow range of motion and positive cozen's test<sup>8</sup>.

Treatment can be non-operative and operative<sup>9</sup>. Non-operative methods include rest, physical therapy, brace, oral NSAIDs, corticosteroid injections, autologous blood injections, laser therapy and extracorporeal shock wave therapy<sup>10</sup>.

Dry needling is relatively new in the non-operative management of tennis elbow<sup>11</sup>. Operative treatment includes open, percutaneous or arthroscopic excision of the diseased tissue<sup>12</sup>. The non-operative treatment is effective in 90% of patients in relieving symptoms. Remaining 10% of

patients fails to improve with non-operative treatment and are labeled as resistant or refractory cases<sup>13</sup>.

There are very few studies especially locally investigating the efficacy of autologous blood injections plus dry needling in refractory tennis elbow. Refractory cases are usually treated with surgery, but still upto 10% of the operated patients remain symptomatic even after surgery<sup>14</sup>.

In this study, we have evaluated the efficacy of autologous blood injections plus dry needling in the treatment of refractory tennis elbow.

## MATERIAL AND METHODS

In this descriptive study, a total of thirty four patients with refractory tennis elbow were included in the study from July 2016 to June 2018 at Outpatient Department (OPD), MTI Khyber Teaching Hospital, Peshawar KPK Pakistan. The inclusion criteria were as follows; patients of either gender, aged 20 to 60 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 > 12 weeks, VAS score greater than 4, patients not responding to other treatment modalities including steroid injections. The exclusion criteria were as follows; patients having pregnancy, rheumatoid arthritis, diabetes mellitus, cervical radiculopathy, elbow arthritis/other concomitant elbow pathology, carpal tunnel syndrome, VAS score of less than 4, history of recent trauma, history of previous autologous blood injection and elbow surgery. After approval of the hospital ethical and research committee, all the patients meeting the inclusion criteria were informed about all the

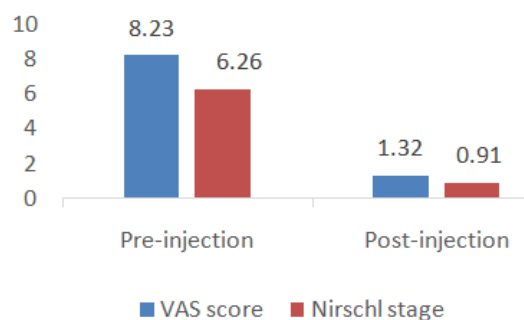
aspects of the procedure/study and written informed consent was taken. Detailed history, physical examination and x-rays the affected elbow anteroposterior and lateral views were performed for all the patients. Pre-injection VAS pain score and Nirschl staging<sup>15</sup>(Table 1) were calculated for every patient. All the patients were injected at the point of maximal tenderness of lateral side of the affected elbow with local anaesthetic(1ml of 2% plain lignocaine) into the skin and subcutaneous tissue under aseptic technique. Then prior to the removal of the needle, dry needling was performed by making multiple punctures (6-8) into the underlying tissue in different directions through the same skin entry point. Then 2ml of autologous blood taken from contralateral arm was injected into the point of maximal tenderness. All the patients were kept in observation for an hour after the injection. Patients were advised not to do strenuous activities and to use oral diclofenac for pain. All the patients were scheduled for follow up at 4 weeks, 8 weeks and 12 weeks to calculate VAS score and Nirschl staging and examine for any complications. SPSS version 21 was used for data analysis and p-value <0.05 was considered significant.

## RESULTS

Out of 34 patients, 24(70.59%) patients were females and 10(29.41%) were males. Mean age of the patients was 38.76±6.96 years. In 27 (79.41%) patients, right elbow was involved while in 7 (20.59%) of patients, left elbow was involved. Most of the patients (n=26, 76.47%) were in age range of 30-50 years (Table 1). 5 patients (14.71%) were in age range of 20-30 years, 15 patients (44.12%) were in age range of 31-40 years, 11 patients (32.35%) were in age range of 41-50 years and 3 patients (8.82%) were in age range of 51-60 years. Mean duration of symptoms was 15.73±3.02 weeks. 22 patients (64.71%) had severe(8-10) VAS pain score while remaining 12 patients (35.29%) had moderate(5-7) VAS pain score.

**Table 1: Age range and gender of patients**

Age (years)	Male	Female	Total	%
20 - 30	1	4	5	14.71
31 - 40	4	11	15	44.12
41 - 50	5	6	11	32.35
51 - 60	-	3	3	8.82
Total	10	24	34	100.0



**Fig. 1:** Mean pre-injection and post-injection VAS score and Nirschl staging at 12 weeks

At 12 weeks, mean VAS pain score decreased from 8.23±1.48 to 1.32±2.15 while mean Nirschl stage

decreased from 6.62±0.88 to 0.91±1.62 as shown in Figure 1. There was statistically significant decrease in VAS pain score and Nirschl stage at 12 weeks (p-value <0.05). No local or systemic complication was noted. No patient was lost to follow up.

## DISCUSSION

Lateral epicondylitis is the 2<sup>nd</sup> most common musculoskeletal disease in the neck and upper limb.<sup>16-19</sup> In our study, females(70.59%) were more commonly affected by tennis elbow than males (29.41%). Similar observations were made by Bharti et al<sup>3</sup> and Arik et al<sup>20</sup> while Ozturan<sup>21</sup> reported equal gender distribution of tennis elbow. Mean age of the patients was 38.76±6.96 years while most of the patients 76.47% were in the age range of 30-50 years. This is similar to observations made by Dojode<sup>22</sup>. In 27 (79.41%) patients, right elbow was involved while in 7 (20.59%) patients, left elbow was involved which goes with other studies.<sup>22,23</sup>

At 12 weeks, mean VAS pain score decreased from 8.23±1.48 to 1.32±2.15 while mean Nirschl stage decreased from 6.62±0.88 to 0.91±1.62. There was statistically significant decrease in mean VAS pain score and Nirschl stage at 12 weeks (p-value <0.05). Bostan et al<sup>24</sup> in their study on autologous blood injections showed a decrease in mean VAS pain score and Nirschl stage from pre-injection values of 8.17±1.20 and 5.55±1.10 to post-injection values of 1.44±1.94 and 1.00±0.97 (p-value <0.001) respectively at 6 weeks follow up. They further showed that there was improvement in mean VAS pain score and Nirschl stage at one year follow up that was maintained till third year of the study. Autologous blood is shown to deliver platelets and various growth factors to the diseased area which help in tissue repair and regeneration.<sup>25,26</sup> In study on autologous blood injections in refractory tennis elbow by Edward et al<sup>27</sup> reported that 79% of patients were completely relieved of pain at mean follow up of 9.5 months. In multiple randomized controlled trials comparing autologous blood injections with local corticosteroid injections, autologous blood injections were shown to have more sustained relief of pain and lower recurrence rates as compared to steroid injections.<sup>20,22,28,29</sup>

It is stated that steroid injections have only short term benefits, are not beneficial in long term and rather may actually be harmful over longer periods.<sup>30</sup> Healing and repairing potential of autologous blood injections in tennis elbow has been confirmed ultrasonically by Connel DA et al and they suggested that ultrasound could be used to guide injections and monitor changes in the common extensor origin.<sup>31</sup>

Dry needling is novel treatment in the management of painful musculoskeletal disorders<sup>11</sup>. It is suggested that dry needling causes bleeding into the tendon which increase inflammation and induce the release of various growth factors. This stimulates tendon healing.<sup>32</sup> It also exerts a positive impact on rehabilitation.<sup>33</sup>

## CONCLUSION

Autologous blood injection plus dry needling is effective in the treatment of refractory tennis elbow. We recommend long term comparative study to confirm the results

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