

Original Article

A Study on the Effect of Applying Cast Splints in Treatment of Tennis Elbow

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ABSTRACT

Background: Tennis elbow is a common orthopedic disease affecting elbow in middle aged people. Ninety percent of patients are cured using conservative treatments. In the past, emphasis was placed on the use of long arm splints for its treatment; however, recent studies put doubt on the use of this method of treatment for the complications arising from the application of splints. The results of using long arm splints for the treatment of tennis elbow were evaluated in our study.

Methods: This was a case series non randomized clinical trial involving 25 patients treated with long arm cast-splints, and 25 patients treated without the use of splint. Local corticosteroid injections and oral NSAIDs were administered for all patients. The two groups were compared in the third week, third month and sixth month of their treatment for the presence of local tenderness and pain in passive flexion test of wrist and fingers against resistance. Using SPSS 9.0, data were analyzed via repeated measurements test of ANOVA

Results: Patients in case and control groups had mean ages 43.6 ± 7.2 and 43.6 ± 6 years, respectively. Prior to any treatments, all patients in this study suffered from pain and tenderness in the origin of forearm extensor muscles. Their pain exacerbated upon passive flexion of wrist and fingers against resistance. No significant difference was seen in third week, third month and sixth month (P value =0.32), and no significant difference was seen in the results of our tests regarding the presence of local tenderness and pain in passive flexion of wrist and fingers against resistance between the two groups

Conclusions: After a follow-up period of six months, this study demonstrated no statistically significant difference between the two groups treated with and without long arm splints.

Keywords: Tennis elbow, Conservative treatment, Laterals epicondylitis, Cast splint

Lateral epicondylitis (tennis elbow) is a common dysfunction of upper limb, affecting 1-3% of population. It usually occurs between the ages of 32-60 with a mean age value of 42-46 years^{1,2}. The most common cause of lateral epicondylalgia is overuse of the extensor carpi radialis brevis muscle² and therefore, it interferes with normal function of the affected limb by weakening extensor muscles of forearm and wrist³. Because there is no general agreement concerning its pathophysiology, there are more than 40 different treatments² suggested. However, spontaneous recovery is known to occur within 8-12 months². The main methods of treatment are proved the non operative treatments which are succe-

ssful in more than 90% of patients.^{2,3,4,5,6}. The non operative methods of treatment include shock wave therapy, topical and systemic NSAIDs administration, oral corticosteroid, local corticosteroid injection and applying splints^{3,4,7,8}. A mean duration of 2.5-2.8 years of conservative treatment before attempting surgery has been reported in different studies⁹. Although during the past decade, emphasis has been put on the use of long arm splints as a suitable method of treatment¹⁰, recent studies have questioned the value of long arm splints basically for the associated decrease in elbow range of motion and increased muscle weakness

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during a minimum treatment period of three weeks⁷. In contrast, 91% of patients have shown clinical improvement after one week of treatment with local corticosteroid injections¹¹. Few studies have compared the outcome of applying and not applying splints and also the use of corticosteroids. We tried to offer a more scientific and accurate assessment of the effects of using splints in the treatment of tennis elbow. This study was conducted to assess the outcome of applying, or not applying splints in treatment of patients with tennis elbow.

Materials and Methods

In a non randomized clinical trial 66 patients were chosen among patients who referred to the orthopedics clinic and were diagnosed as tennis elbow. Because of ethical considerations and infeasibility of blinding the study, the samples were placed in two groups using the non randomized simple method. The patients themselves were allowed to opt for the use of splint after being provided with necessary explanations.

The patients' occupation, gender and age were recorded to allow for possible distorting effects. Patients aged between 20 and 60 years diagnosed with tennis elbow were included in the study. The diagnosis of tennis elbow was established based on the presence of pain and local tenderness in the origin of extensor muscles of forearm adjacent to lateral epicondyl, and exacerbation of pain in this location upon passive flexion of wrist against patient's resistance.

Exclusion criteria included contraindication for the use of corticosteroid injections and oral NSAIDs, accompanying radial tunnel syndrome, abnormal elbow X ray, irregular follow-up referrals, patients who demonstrated dysfunction in the shoulder, neck and/or thoracic region, local or generalized arthritis, neurological deficit, bilateral epicondylalgia, pregnancy, patients using pacemaker, operated on the affected elbow, sustained trauma during the course of study and personal decision.

Every patient was given a 40 mg injection of Methyl Prednisolone Acetate with 0.5 ml Lidocaine 1% in the area of tenderness adjacent to lateral epicondyl. All injections were done by the same person. All patients were given 400 mg Ibuprofen pills three times a day for ten days. In the case group, long arm cast splint was applied (from distal palmar crease to proximal arm) for 21 days, in 90° flexion of elbow and 10-15° extension of the wrist, patients in the control group were treated without splinting.

Twenty five patients in each group completed the six month follow-up period. Eight patients were excluded from the study due to different reasons such as irregular follow-up referral or personal decision

All patients were evaluated for pain, local tenderness and the clinical test of wrist and finger flexion against resistance prior to treatment, three weeks, three months and six months after initiation of treatment.

Data were presented as mean \pm standard deviation (SD). Repeatedly measured variables were compared between the two groups using repeated measures analysis of variance. A P value less than 0.05 was considered as statistically significant.

Results

The first group (treated with long arm splint) consisted of 3 men (12%) and 22 women (88%). The second group (treated without long arm splint) consisted of 8 men (32%) and 17 women (68%). The two groups did not show a significant difference in this regard ($P=0.42$). Mean and SD of age was 43 ± 7.2 years in the first group and 43.5 ± 6 years in the second group ($P=0.82$). Twenty eight percent of patients in the first group were employees, 12% were workers and 60% were housewives ($P=92\%$). All patients complained of pain and local tenderness in their lateral epicondyl of elbow against resistance. The degree of symptom improvement was assessed and compared between the two groups within three weeks, three months and six months from the beginning of treatment.

Using the statistical analysis test of repeated measures of ANOVA, no significant differences were seen in third week, third month and sixth month (P value= 0.32), and no significant differences were seen in results of our tests regarding presence of local tenderness and pain in passive flexion of wrist and fingers against resistance between the two groups (P value= 0.78).

Discussion

This study was planned and conducted to evaluate the outcome of using long arm splint in the treatment of patients with tennis elbow in a follow-up period of six months. The degree of improvement in patients' symptoms at the end of the study was consistent with the effectiveness of supportive treatments used in other studies¹⁰. Much emphasis has been put over the past six decades on the use of long arm splints in the treatment of patients with tennis elbow. This method is associated with extra costs, atrophy of forearm muscles and limited range of motion of wrist and elbow (at least temporarily)¹². Other studies have demonstrated that local corticosteroid injections are of greater efficacy compared to placebo in improving the patients' symptoms in four month, six month and one year follow-up¹³.

Few studies have focused on the effect of applying splint in association with administering local corticosteroid injections in treatment of patients with tennis elbow. Most previous studies simply compared a group of patient treated only with splints with a group treated only with corticosteroids^{12, 13}. In our study, it was demonstrated that long arm splints do not lead to a significant improvement of the patients' symptoms when used in association with local corticosteroids and oral non steroidal anti inflammatory agents. The use of splints merely burdens the patients with additional costs of treatment, risk of muscle weakness, reduced range of motion of elbow and difficulty in performing some personal tasks.

However, an identical improvement was observed in both groups throughout the study².

The specificity of the tests used in this study correspond very well to the results shown in previous studies which further support the validity of tests used².

The results of the present study do not support the use of splint in the treatment of lateral epicondylalgia. Besides discomfort and pain, tennis elbow leads to economic consequences such as sick leaves, workers' compensation claims, transfers to lower paid jobs and even early retirements². For that reason, further research should be carried out to clarify the pathophysiology of tennis elbow as well as the role of steroids and other treatments in this painful condition to give rise to more selective treatment options in future².

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