

Original Article**Extracorporeal Shockwave Therapy In Patients With Lateral Epicondylitis**

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Abstract

Aim: The aim of this study is to investigate the short and mid term effects of extracorporeal shock wave therapy (ESWT) in lateral epicondylitis (LE). **Method:** Fifty six elbows of 48 patients (35 female, 13 male) which were applied ESWT at least for 3 sessions for lateral epicondylitis were evaluated retrospectively. VAS scores recorded before treatment and scores recorded at first week and 3rd month after treatment and clinical evaluation scores for LE of Werhaar et al were evaluated. **Results:** Significant recovery was found when pain levels before and after treatment were compared. The mean pain score before treatment decreased to $4,82\pm 1,87$ at 1st week and to $3,98\pm 2,07$ from $7,07\pm 1,73$. According to Verhaar LE evaluation score, the number of good and excellent scores were increased while the number of bad scores decreased. **Conclusion:** As ESWT is a painless, effective method with less side effects, it is a method to perform before surgery in cases which did not respond to other conservative treatment modalities.

Key Words: Lateral epicondylitis, Tennis elbow, ESWT

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Introduction

Lateral epicondylitis (LE) also known as Tennis Elbow is characterised by degenerative changes of musculotendineous portion of lateral epicondyle which are because of repetitive tension of wrist extensor tendons (1). The incidence is 1-3% and it is the most common cause of elbow pain in adults (2,3). Traditional treatment modalities for LE are rest, orthosis, physical therapy, acupuncture, mobilisation, manipulation, nonsteroid anti-inflammatory drugs (NSAID) and steroid injection (3). Surgical treatment may be necessary in case of failure with conservative methods. However, new treatment methods such as ESWT, otolog total

blood or platelet rich plasma injection, prolotherapeutic botulinum toxin injection were begun to be used in recent years (1). ESWT is a painless modality with very less side effects (4) so it is more tolerable and easy to perform. ESWT was first begun to be used for pseudoarthrosis and delayed union in 1983 and FDA (US Food and Drug Administration) approved ESWT being used for LE in 2003 (5). Although ESWT is used commonly since 2003, there are contradictory results in the literature and also the number of studies about ESWT in recent years is not sufficient. In this study, we aimed to investigate the efficacy of ESWT on

pain and function at short and mid term in treatment of LE.

Methods

Fifty-nine patients' data who were diagnosed LE and applied at least 3 sessions of ESWT between 2011 and 2012 in physical therapy clinic were examined. Eleven patients were excluded because of not completing sessions. A total of 56 elbows of 35 female and 13 male patients were included in the study. Gender, age, length, weight, duration of symptoms were recorded. ESWT was not applied below age 18, pregnant and patients with systemic inflammatory disease. ESWT was applied once a week, totally 3-5 sessions by STORZ device at 8 Hz frequency, 2-2,5 barr and 2000-2500 shots/session for right elbows of 31 patients, left elbows for 9 patients and both elbows for 8 patients. Non-steroid antiinflammatory medication was ended at the time of ESWT application and no analgesic treatment was given to patients. Pain levels of each elbows before treatment and after treatment on first week and 3rd. month evaluated by Visual Analogue Scale (VAS) and Verhaar's LE evaluation scores were recorded. According to Verhaar et al (6) scoring system, symptoms were evaluated as excellent, good, moderate and bad.

Excellent

Complete relief of pain on lateral epicondyle
Complete patient satisfaction after treatment
No loose at strong grasping
No pain at resistance to wrist dorsiflexion

Good

Mild pain on lateral epicondyle after strong stretching activities
Patient satisfaction after treatment
None or mild loose at strong grasping
No or mild pain at resistance to wrist dorsiflexion

Moderate

Moderate pain on lateral epicondyle after stretching activities
Moderate Patient satisfaction after treatment

Moderate loose at strong grasping
Moderate pain at resistance to wrist dorsiflexion

Bad

Insisting pain on lateral epicondyle
Unsatisfied patient after treatment
Serious loose at strong grasping
Serious pain at resistance to wrist dorsiflexion

SPSS 16.00 programme was used for statistical analysis. In the analysis of differences between preoperative and postoperative VAS scores, Friedman test was used. In case of Friedman test was significant, Wilcoxon Signed test was used in binary comparisons with performing Bonferroni Correction. The correlation between the difference of VAS scores before and after treatment with age BMI, and duration of symptoms was evaluated by Spearman's rank order, and the correlation with gender was evaluated by korelasyonuna Mann-Whitney Test. According to these evaluations, p values under 0,017 were assigned as significant.

Results

The number of patients was 48 with 35 females (72.9%) and 13 males. (27,1%) ESWT was applied for right elbows of 31 patients (64.6%), left elbows for nine patients (18.8%) and both elbows for eight patients (16.7%). The demographical data of patients and VAS scores before treatment and scores after treatment at 1st week and 3rd month was given in table 1. A significant improvement in VAS scores after treatment was found when compared with scores before treatment. Additionally a significant improvement was found between the scores of 3rd.month and 1st week (Table 2). According to Verhaar LE evaluation scores, there was no patient in Excellent and Good groups before treatment while there were 3 in Excellent and 20 in Good groups at 1st week after treatment. At 3rd month, there were 11 patients in Excellent, 31 patients in Good, 10 patients in Moderate and 4 patients in Bad groups. While the number of patients in Bad group was 37 before treatment, it dropped to 7 at 1st. week and to 4 at 3rd.month (Table 3).

Table 1. The demographical data of patients and VAS scores before treatment and scores after treatment at 1st week and 3rd month

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Median</i>	<i>Mean± SD</i>
<i>Age</i>	48	25,00	77,00	-	56,04±13,01
<i>BMI</i>	48 patients	21,26	34,67	-	27,38±3,61
<i>Symtom duration</i>	56 elbows	3,00	20,00	-	7,91±4,58
<i>VAS0</i>	56 elbows	4,00	10,00	7	7,07±1,73
<i>VAS1st.week</i>	56 elbows	1,00	8,00	5	4,82±1,87
<i>VAS3rd.month</i>	56 elbows	1,00	9,00	3	3,98±2,07
<i>WKDS-0</i>	56 elbows	2,00	3,00	3	-
<i>WKDS-1st.week</i>	56 elbows	0,00	3,00	2	-
<i>WKDS-3rd.month</i>	56 elbows	0,00	3,00	1	-

Table 2. The comparison of Visual Analogue Scale (VAS) scores before and after treatment.

	<i>VAS1st.week</i>	<i>VAS3rd.month</i>
<i>VAS0</i>	<0,01*	<0,01*
<i>VAS1st.week</i>	-	<0,01*

- : p value according to Wilcoxon Signed test (p< 0,017:significant)

Table 3. Verhaar LE evaluation scores of patients before and after treatment

	<i>Excellent n (%)</i>	<i>Good n (%)</i>	<i>Moderate n (%)</i>	<i>Bad n (%)</i>
<i>WKDS-0</i>	0	0	19 (%39.9)	37 (66.1)
<i>WKDS-1st.week</i>	3 (%5.4)	20 (%35.7)	26 (%46.4)	7 (12.5)
<i>WKDS-3rd.month</i>	11 (%19.6)	31 (%55.4)	10 (%17.9)	4 (%7.1)

Table 4. The correlation between improvement of VAS scores and duration of symptoms, age, gender and BMI.

	VAS0- VAS1	VAS0- VAS3	VAS1-VAS3
Gender	NS	NS	NS
Age	NS	NS	NS
BMI	NS	NS	NS
Duration of symptoms	NS	NS	NS

NS: Non significant

Discussion

We have found ESWT applied in the treatment of LE effectively on elbow pain and function at short and medium term according to the results of this retrospective study. Reduction in pain intensity was observed after treatment of patients. According to Verhaar's assessment scoring lateral epicondylitis, the number of patients in the poor outcome group decreased while the number of patients in the excellent and good outcome group increased. ESWT was considered as an alternative modality to other conservative therapies in the treatment of LE in recent years (3). However there is no consensus about the effectiveness of the ESWT in the treatment of LE in the literature. Although some studies and meta-analyzes results' claim that this method is effective, some have also argued that completely ineffective. Gunduz et al (3) applied physical therapy in 19 patients, corticosteroid injections in 20 patients, and ESWT in 20 patients in a clinical study. They have compared the effectiveness of each method with clinical examination and ultrasound at the first, third and sixth month after the treatment. ESWT has been clinically found to be effective in each period. Also, the effectiveness of ESWT has been found significantly higher than other methods at the end of the sixth month. Rompe JD et al found ESWT significantly more effective than placebo in a study which conducted with tennis players (7). ESWT treatment was reported to be effective in another study of Rompe JD et al (8). However,

different results of studies are also available. Staples et al (9) randomized 68 patients into two groups. Therapeutic dose ESWT was applied to one of the groups and non therapeutic dose ESWT was applied to other group in 3 sessions. Both groups were compared in terms of pain and function at 6 weeks, 3 months and 6 months. They did not find a significant difference between the two groups. Melikyan EY et al (10) found efficiency of ESWT similar with placebo in a placebo-controlled study. Haake M et al (11) did not find ESWT effective over placebo in a multicenter study and they suggested application of ESWT only in clinical trials until its effect proved. Some of the current meta-analysis in the literature have found ESWT effective in the treatment of LE (12). However some of the meta-analysis claimed that the results of studies are contradictory and there is not sufficient evidence on the effectiveness of ESWT in treating LE (13,14). Buchbinder et al (15) concluded that ESWT has no or minimally and insufficient effect on function and pain in LE treatment in their meta-analysis. Contrary to common opinion in the literature, the results of our study supports that ESWT is a safe and effective method in LE treatment. Different results may be due to different doses and different treatment protocols. We recommend that prospective, controlled trials that compare different doses and treatment protocols are needed to get a clearer approach on the subject.

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