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CASE STUDY

EPICONDYLITIS BAND OR CORTICOSTEROID INJECTION FOR LATERAL EPICONDYLITIS TREATMENT?

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ABSTRACT

Aim: Comparison of the short- and medium-term results of the epicondylitis band and corticosteroid and local anesthetic injections for lateral epicondylitis.

Study Plan: This was a retrospective and comparative study related to acute lateral epicondylitis treatment. The patient groups named A and B received two different treatments. There were 151 patients in Group A and 205 patients in Group B. Group A received the epicondylitis band and Group B corticosteroid and local anesthetic injections. Both groups were also given stretch exercises and nonsteroidal anti-inflammatory drugs. Patients were checked at week 1, 4, 12, and 24 and the Quick DASH scoring was used on week 12 and 24.

Results: On the 3rd month of treatment, Group A showed recovery rates of moderate, good and full in 18.5%, 32.5% and 30.5% respectively while these rates were 33.2%, 13.7% and 25.4% in Group B. The same rates at the end of month 6 were 17.2%, 41.1% and 17.2% in Group A and 28.3%, 1% and 17.2% in Group B.

Conclusions: Combined treatment (physical therapy, nonsteroidal anti-inflammatory drugs) with an epicondylitis band was more effective than combined treatment with steroid and local anesthetic injections in acute lateral epicondylitis.

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INTRODUCTION

Lateral epicondylitis has been identified as tendinosis developing in the region where extensor muscles and especially the extensor carpi radialisbrevis muscle originate after these muscles are forced or undergo repetitive stress at the lateral humeral epicondyle and the condition can also be accompanied by microtrauma or partial tears that can progress to complete tears (Nirschl and Pettrone, 1979). It can be easily diagnosed with a good medical history from the patient and physical examination and it is typically characterized by recurrence of the pain after repeated excessive and forced movements in the arm. The value of radiographs in the diagnosis is very low (Pomerance *et al*., 2002). The presence of pain in the lateral condyle with repeated supination and pronation while the elbow is in extension or the wrist is forced to extension against resistance is enough to diagnose lateral epicondylitis (Nirschl and Pettrone, 1979; Jobe and Ciccotti, 1994; Cohen *et al*., 2008). Lateral epicondylitis was first identified in 1873 by Runge as 'handwriting cramp' (Lopes-Martins and Albertini, 2006). The mean incidence is 1-3% (Smidt *et al*., 2002). It is most commonly seen in 4th and 5th decades (Lopes-Martins *et al*.,)

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The disorder is 7-10 times more common than medial epicondylitis (Ciccotti *et al*., 2004). It improves in 1 year (6-24 months) on average with treatment (Smidt *et al*., 2002). The first option is generally conservative treatment (Papa *et al*., 2012). The conservative treatment methods used are usually local corticosteroids + local anesthetic injection, epicondylitis band application, extracorporeal shock wave therapy (ESWT), acupuncture, physical therapy, ultrasound phonophoresis, electrotherapy and NSAI iontophoresis treatments, transcutaneous electrical nerve stimulation (TENS), low-grade laser treatment, autologous blood injection, topical nitrates, and type A Botulinum Toxin (Botox) injection (Smidt *et al*., 2002; Johns *et al*., 2002; Uzunca *et al*., 2007; Chesterton *et al*., 2009; Papa *et al*., 2012). Surgical procedures can be considered in cases that do not respond to conservative treatment for 6-9 months. Many surgical techniques have been described (Nirschl *et al*., 1979). The epicondylitis band is thought to have an effect by decreasing the load at the initial adhesion sites of the extensor muscles and there are various studies on the mechanism of action (Meyer *et al*., 2002; Altan *et al*., 2008). Corticosteroid + local anesthetic drug injections show their effect in the same area with their anti-inflammatory feature (Meyer *et al*., 2002; Struijs *et al*., 2004). Lateral epicondylitis pain can be explained by the tenopathy and arthrogenic and neurogenic mechanisms. Compression of the radial nerve is

effective in the neurogenic mechanism. Erak *et al*. (2004) identified that the deep branch of the radial nerve started the pain with the increase of the tensile forces of the extensors on the lateral epicondyle in a biomechanical study. Decompression of the radial nerve should be among the alternatives when considering a surgical procedure in resistant cases (Meyer *et al*., 2002).

PATIENTS AND METHODS

Our retrospective, comparative study using the chart review model was conducted via the information obtained from the charts of 356 patients who were referred to the orthopedics departments of two separate hospitals from the outpatient departments of various specialties between February 2010 and June 2013 with symptoms of elbow pain and limitation of movement and diagnosed with unilateral lateral epicondylitis with orthopedic clinical examinations and investigations, whose initial Quick Dash scores were similar, who had difficulty in performing their daily activities, and who were followed-up and treated. The distribution of the patients to the two orthopedics outpatient departments was realized directly according to the patients' presentations. The approval of the local ethics committee was obtained and the age, gender, occupation, treatment choice, results and Quick DASH scores were recorded from the files of the patients included in the study. The patients were distributed into two separate treatment groups as A and B. There were 151 patients in group A and 205 patients in group B. Patients who had received another epicondylitis treatment within the last 6 months, diagnosed with bilateral epicondylitis, had cervical radiculopathy or systemic musculoskeletal and neurological disorders, had a history of surgical intervention or trauma to the elbow, had chronic diseases, patients with contraindications for corticosteroids, pregnant or nursing women, patients younger than 16 years, those receiving oral or systemic steroid therapy, and patients with psychiatric problems were excluded from the study.

Group A received an epicondylitis band + combined treatment to the forearm 3-4 cm distal from the lateral epicondyle (Figure 1) for 3 months and group B received corticosteroids and local anesthetic injection (betamethasone 2 mg 1 ml and 2% lidocaine 1 ml) (Figure 2)+ combined treatment. An injection was administered one more time 4 weeks later to some of the patients in Group B according to the treatment response.

Figure 1. Therapeutic forearm band for tennis elbow (lateral epicondylitis)

Figure 2. Cortcosteroid with local anesthetic injections for treatment of lateral epicondylitis of elbow

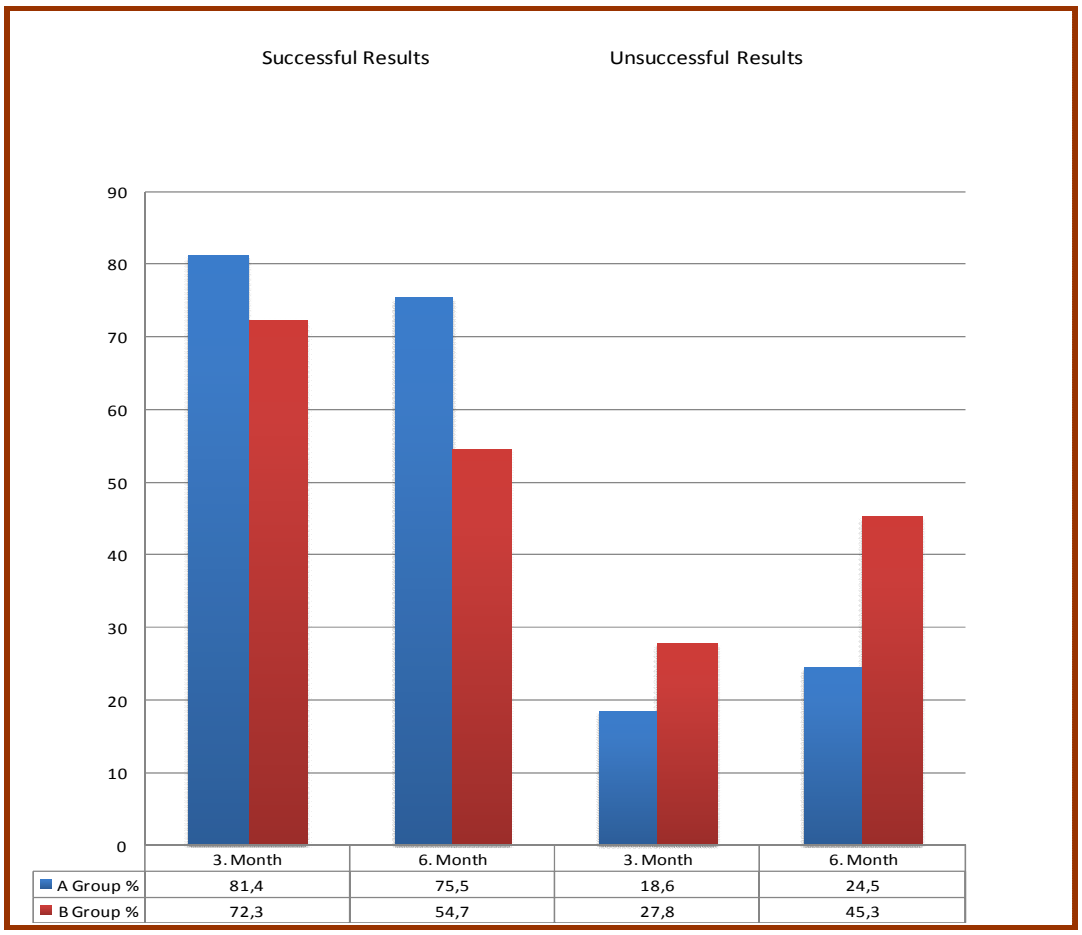
Figure 3. Eccentric contraction exercise

Figure 4. Concentric contraction exercise

The combined treatment protocol for both groups included concentric contractions, eccentric exercises (figure 3-4), NSAIDs (oral/topical), and cold/hot compress applications. The follow-up examinations were performed at the 1st, 4th, 12th and 24th weeks. The results obtained during the follow-ups at the 12th and 24th weeks were evaluated with Quick DASH Scoring (Öksüz *et al*., 2006; Franchignoni *et al*., 2010). Quick DASH scores were defined as 0% none, 25% partial, 50% moderate, 75% good, and 100% full improvement.

Table 1. According to the results of the treatment of group A and B success graphic

Patient groups	Gender				Age (Years)							
	Famale		Male		15-20		20-40		40-60		60-85	
	n	%	n	%	n	%	n	%	n	%	n	%
Group A	102	67.54	49	32.45	3	1.98	30	19.86	106	70.19	12	7.94
Group B	129	62.92	76	37.07	2	0.97	27	13.17	139	67.8	37	18.04
Patient groups	Affected side				Occupation							
	Right		Left		Housewife		Worker		Officer		Other	
	n	%	n	%	n	%	n	%	n	%	n	%
Group A	97	64.23	54	35.76	70	46	28	19	18	12	35	23
Group B	113	55.12	92	44.87	107	52	20	10	20	10	58	28



Statistics: Statistical analyses were performed with the SPSS 13 program using the X^2 test and comparison of percentages.

RESULTS

A total of 356 lateral epicondylitis patients consisting of 231 (64.8%) females and 125 (35.2%) males were included in 2 groups in our study. The mean age of the patients was 48.5 +/- 10.7 years. The affected side was the right in 210 (58.9%) patients and the left in 146 (41.1%) patients. The patients were diagnosed with physical examination. The mean duration of presentation was 1.9 weeks in group A and 1.7 weeks in group B. The patients had usually presented shortly after the beginning of the symptoms. Conservative treatment (oral/topical NSAID, epicondylitis band, oral paracetamol) had previouslybeen used by 80 (22.4%) patients. We evaluated 151 patients in group A and 205 patients in group B. A surgical procedure was performed in 6 (3.9%) patients in group A and 18 (8.7%) patients in group B as there was no decrease in symptoms at the end of the 6-month treatment period. A second injection was administered to 54 (26.3%) patients in group B at the 4th week. Group A patients fully complied with the epicondylitis band application. Age, gender, occupation, and the affected side are presented in Table-1 by group. The patients were evaluated with specific Quick DASH scoring in the 12th and 24th weeks in our study. Quick DASH scores according to the groups are presented in Table-2. We accepted moderate, good and very good Quick DASH scores as successful treatment and no benefit and little benefit results as unsuccessful treatment (Table-3). According to these results, the short-term improvement after 3 months of treatment was moderate in 18.5%, good in 32.5% and complete in 30.5% in Group A and the treatment was successful in 81.5% and unsuccessful in 18.5%. The results for group B were moderate in 33.2%, good in 13.7% and complete in 25.4% and the treatment was successful in 72.3% and unsuccessful in 27.7%.

After 6 months, the respective percentages for moderate, good and complete improvement were 17.2%, 41.1%, and 17.2% with 75.5% successful and 24.5% unsuccessful in group A. The six-month figures for group B were 28.3% moderate, 1% good, and 25.4% complete improvement with the treatment being successful in 54.7% and unsuccessful in 45.3%. We see that treatment of group A was more successful than group B in the 3rd month ($p<0.05$), and much more successful than group B in the 6th month ($p<0.001$) in terms of the number of patients who were successfully and unsuccessfully treated according to the Quick DASH scores. These results show that a better result was obtained in group A than group B in both periods. No significant side effect was found in group B but there was subcutaneous fat necrosis in 5 patients. These patients underwent surgical procedures when their symptoms did not decrease and they had moderate improvement postoperatively.

DISCUSSION

Conservative methods are first used in the treatment of acute lateral epicondylitis (Papa *et al*., 2012). One of the most widely used methods is corticosteroid and local anesthetic injection (Altay *et al*., 2002; Saccomanni *et al*., 2010). Injection treatment is preferred because good results can be obtained in a short time. Adding physical therapy methods (stretching and lengthening exercises for the elbow extensor muscles and tendons, cold or hot compress applications, etc.) and NSAI treatments has been shown to increase the success rate and duration in many randomized studies (Smidt *et al*., 2002; Altay *et al*., 2002; Baskurt *et al*., 2003; Trudel *et al*., 2004; Lopes *et al*., 2006; Bisset *et al*., 2006; Yarrobino *et al*., 2006; Papa *et al*., 2007; Allan *et al*., 2007). A study reported that 90% of lateral epicondylitis cases recovered within 6 months while the remaining 10% consisted of resistant cases and had to undergo surgery (Trinh *et al*., 2004). The total rate of moderate, good and very good results was 81.5% in group A and 72.3% in group B at the 3rd month and 75.5% in group A and 54.7% in group B at the 6th month. We therefore only obtained good results similar to those reported in group A. A surgical procedure was performed in 6 (3.9%) patients in group A and 18 (8.7%) patients in group B when conservative treatment was unsuccessful. Comparing steroid and local anesthetic injection treatment with placebo, local anesthetic injection, and the wait-and-see technique revealed that quite good results were obtained in the term period but no difference was present over time (Smidt *et al*., 2002). The effect magnitude and duration of the epicondylitis band was better than with injection treatment, both in the short term and the long term in our study. The epicondylitis band is used commonly worldwide and has been shown to have a large contribution in resting the affected sensitive radial region, decreasing edema, and accelerating the treatment based on the force distribution principle in localizations closer to the regions where the extensor tendon originates from, although the mechanism of action is not fully clear (Struijs *et al*., 2004; Altan *et al*., 2008). It has also been demonstrated in recent years that pain decreases significantly and the capacity of movement increases in the elbow with the wrist extension orthosis used for the conservative treatment of lateral epicondylitis (Garg *et al*., 2010). The rate and maintenance of successful treatment in the two groups did not very greatly with our principle of combined treatment. Injection treatment in group B caused increased pain and movement limitation in some of our patients but these decrease after a few days. We also observed subcutaneous fat necrosis in 5 (2.4%) patients and the number of patients requiring a 2nd injection was 54 (26.3%). There were no other complications. The epicondylitis band did not cause any complications in any of our patients. Epicondylitis band application caused difficulty in daily activities from time to time but this did not lead to disruption of the ongoing treatment. Use of the band was continued in cases with moderate scores during the next 6 months in Group A and this was seen to have positive effects on the result.

It was noteworthy that a large proportion of our patients consisted of women and most were housewives. The fact that only 7 (2%) patients of our subjects played active tennis indicates that the "tennis elbow" term should be reevaluated. It is also known that lateral epicondylitis is not mostly seen in tennis players (Kaminsky and Baker, 2003). We recommend that a 3rd group should be studied using a wait-and-see method, placebo, wrist extension orthosis or just steroid injections and evaluated with longer follow-up durations as the next stage of this study. In conclusion, elbow pain is the main symptom in acute lateral epicondylitis and movement limitation associated with this pain is present. The first treatments that should be considered are the conservative methods of epicondylitis bandage or injection of corticosteroids and local anesthetics. Although injection treatment is particularly striking with its short-term effect, we believe that its lack of superiority regarding long-term results and the potential complications require its consideration only as a secondary plan. We also believe that an epicondylitis band with combined treatment should be considered first due to the ease of use, its lack of invasiveness or complications, and the better results with combined treatment in the long term compared to injection treatment.

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