



# EFFICACY OF TENNIS ELBOW (EPICONDYLITIS HUMERI RADIALIS) TREATMENT IN CBR “PRAXIS”

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## ABSTRACT

Tennis elbow (*Epicondylitis humeri radialis*) is the most frequent reason that patients with elbow pain report to a physician. The exact cause of elbow pain is still unclear. However, it is certainly causally connected with connective intersection between forearm muscle and bone in the elbow region.

In this paper, we analyzed patients that, over the period of 15 years, reported to “Praxis” clinic for elbow pain treatment (*Epicondylitis humeri radialis*). Of the total number of 228 patients, 126 were male, 101 female while one patient was younger than 14. Initial analysis established that average overall health condition grade was 2,87 at the onset of treatment. Following the treatment completion that grade was 4,48.

Of the total number of 223 patients who were treated by combined method of manipulation and local corticosteroid instillation, eight patients received physical therapy as well. Thus, surgical treatment was not necessary in any patient.

The patients’ treatment included:

1. Application of manipulative methods in order to reestablish mobility in the “blocked” radio-humeral and the upper radio-ulnar joints.
2. Local instillation of corticosteroid depot in order to control inflammation (enthesitis) and thus, eliminate pain and establish physiological conditions for functioning of joint and local structures. Unlike conservative method which includes initial immobilization due to irritation and inflammation development prevention with concomitant analgesic and antirheumatic therapy, initial application of manipulation with reinstatement of joint mobility instead of immobilization with subsequent instillation of steroid preparations achieves functional restitution and fast reinstatement of full working ability, as a rule.

KEY WORDS: *Epicondylitis humeri radialis*, manipulation, drug therapy.

## INTRODUCTION

Tennis elbow (*Epicondylitis humeri radialis*) is a painful syndrome caused by inflammatory, nonspecific changes in forearm and hand muscles connection at lateral epicondyle of humerus and radio-humeral joint and its capsule. Epicondylitis humeri radialis is an enthesitis at the point where muscle extensor connects to the lateral epicondyle of humerus. It is a degenerative inflammation, which either occurs as a result of an injury to radial epicondyle or develops indirectly, as a consequence of hoarse and/or frequent, synchronous movements of wrist and elbow. Microtrauma to the tendons connection sites result in minor damages and ruptures in tendons fibers that may develop into necrotic changes and cause deposition of calcium salts. Similar changes may result from metabolic disturbance or rheumatism, although rarely. This condition affects about 1-2% of adult population. The most frequently affected individuals are those who utilize forearm musculature to the maximum capacity: workmen who use pneumatic drills, tailors, barbers, bricklayers, drivers, mechanics, ceramic tiles layers, musicians etc. The second category includes sportsmen: tennis players, spear throwers, fencers, bowlers, and hockey, golf and handball players. Lateral epicondylitis reveals itself in the form of pain in the outer part of elbow joint, at the place of the attachment of tendons of hand and fingers extensors, which occurs during work or sports activity. Pain may appear either suddenly or gradually, sometimes spreading along outer side of forearm. In addition, the affected individual describes hand muscles fatigue, which may disable performing everyday activities such as: handling glass, cutlery, opening the door, handshake, sponge draining, handling light objects. It is 7 to 10 times more frequent in radial than in medial humeral epicondyle. It is frequent in middle-aged persons, equally frequent in men and women and generally affects dominant hand. Its names are due to higher frequency of these overexertion syndromes in certain sports. Thus, lateral epicondylitis is referred to as tennis elbow while medial one is known as pitcher's elbow for baseball pitchers. Other than in sportsmen, it is a professional ailment in typists, bricklayers, truck drivers, dentists and surgeons, that is in individuals with frequent contractions of extensors and supinators (lateral epicondylitis) or flexors and pronators (medial epicondylitis). The main symptom includes epicondylal pain of various intensities. Pain is accompanied with the loss in hand power. Clinical

examination resorts to tests based on the contraction of particular muscle group with resistance, which results in pain, in particular to palpation in epicondylal region. Just like in other overexertion syndromes, treatment may include whole range of procedures, from conservative to surgical treatment. Conservative treatment should be adjusted to the intensity of inflammation and pain and include control of further activities. Successful treatment depends on the reduction of irritating movement, resting of certain muscle group, adequate cryo-therapy, isotonic and stretching exercises. Should the response to therapy be inadequate corticosteroid injection may be administered. Should the symptoms of epicondylitis persist (5-10% of the affected) surgical treatment, which involves desinsertion of the affected muscle group, may be necessary. Following the surgical treatment subelbow immobilization implemented for one week. Thereafter, the treatment continues with physical therapy. Diagnostics of epicondylitis humeri radialis relies on a simple test "finger snaffing", which enables explanation of the etiology of humerus lateral epicondylitis. In our group of 196 patients, the positive test result was characteristic of entesopathy of extensor carpi radialis brevis muscle, which is inserted in radial epicondyl. When the test is negative pain is considered to be of spondylogenic, arthrogenic or neurogenic nature. Test is significant for the selection of therapeutical approach and establishment of indications for surgical intervention (1). In the course of surgery, an unknown submuscular lipoma was found to cause supinatory syndrome with fingers extensors paresis. In the cases of pain therapy resistance, in particular in conservative therapy of tennis elbow, non-traumatic supinator syndrome should be considered as diagnostic possibility (2). Following the exact verification of tennis elbow and unsuccessful intensive conservative treatment, application of Hohmann procedure that involves incision to the tendon of proximal extensor is clearly advantageous from patho-physiological point of view. This surgical procedure may safely be performed endoscopically (3). Following ineffective conservative treatment, 55 patients with tennis elbow (29 female and 16 male), of average age 41,1 years (21 to 61), were surgically treated. In 47 patients surgery involved tendon caput communae extensorum while m. extensor carpi radialis was implicated in 3 persons. In 46% of the patients who were monitored for prolonged period (16 to 127 months), surgery produced favorable results similar to those recorded by other authors. This study concurs with general opinion that surgical treatment be indicated only in patients who received unsuccessful conservative treatment (4).

In a study that involved 85 patients with lateral epicondylitis humeri that resisted long-term therapy, extracorporeal shock wave therapy (ESWT) was applied. All the patients received physical therapy, local injections and other conservative procedures over six months period. Three weeks long ESWT was applied under local anesthesia using Dornier Epos Ultra (energy flux density 0,005 to 0,18 mJ/nm<sup>2</sup>). Complications in the form of small hematoma were encountered in only four patients. Following average monitoring period of 3,7 months, it was possible to evaluate 78 patients using Rolles and Maudsley Sore. Excellent results were found in 38%, good results in 42,3%, satisfactory in 11,5% while in 15,4% the results were found to be weak (5). In a group of 25 patients, retrospective analysis following the unsuccessful conservative therapy indicated neurophysiological examination whereby the syndrome of nervus radialis compression was established. Surgical treatment by Wilhelm and Wachsmuth method was indicated (6). In 14 patients with epicondylitis who were resistant to conservative therapy and received surgical treatment by Wilhelm procedure, significant reduction in symptoms was observed following observation period of 7,5 years on average (1-14 years). Therefore, this surgical procedure was recommended (7). In untrained persons, frequently practiced recreational sports activity may result in epicondylitis humeri radialis. In these cases, it is necessary to establish clear differential diagnosis in order to distinguish various pain syndromes that are frequently described as elbow pain. Thus, elbow pain is defined as syndrome ligamentum anularae radii that frequently appears as post-traumatic pain of synovial origin. Osteoarthritis and rheumatoid arthritis may also be linked to the pain of post-traumatic origin. This group also includes patients with elbow pain caused by frequently unrecognized changes in cervical region of spine. Tennis elbow symptoms may be a consequence of radial nerve irritation which imitates supinator syndrome. Younger patients may suffer from osteonecrosis or epifiseolysis (8).

Grade "0" zero:	Immobile
Grade "1" one:	Assisted mobility with difficulties
Grade "2" two:	Mobility with difficulties using aid
Grade "3" three:	Independent mobility using aid
Grade "4" four:	Good functional status with minimal sequelae
Grade "5" five:	Regular functional status
Grade "6" six:	Further medical treatment needed
Grade "7" seven:	Treatment terminated and continued in another CBR

TABLE 1. Clinical condition - grading scale

## MATERIAL AND METHODS

In "PRAXIS" clinic, which is one of CBR – community rehabilitation facilities, retrospective analysis of 2422 patients who have been received with defined RSI diagnosis (Repetitive Strain Injury) over 15-years period was performed. The analysis was performed in order to establish frequency of the conditions that belong into RSI group, the total requirement for CBR rehabilitation and to evaluate the effects of local instillation of corticosteroid depot on epicondylitis humeri radialis (tennis elbow) treatment. Within the group with RSI syndrome we evaluated treatment efficacy in 233 patients with diagnosis epicondylitis humeri radialis. A scale was determined for the grading of clinical condition prior and after the treatment (Table 1). Elbow pain is the main symptom that is related to numerous microlocations within the joint itself, not only to the lateral epicondyl humeri for which it is named. Because of anular ligament and radius capitulum elbow performs rotational movements along longitudinal joint axis in addition to flexion and extension. In our method, manipulation has a major role. It strives to achieve mobility of the joint, which is, at the moment of patients' first examination, functionally "blocked". Simultaneously, joint decompression and relaxation in the conjoint musculature are achieved which result in pain relief.

Following the manipulative therapy, additional instillation of corticosteroids reduces inflammation and contributes to overall physiological reintegration of function of this complex joint. In therapeutical treatment of this syndrome we applied a synthetic depot preparation – Betamethason ampoule of 1 ml with the dosage of 2 + 5 mg. It has strong anti-inflammatory and secondary analgesic activity. It is applied locally, in the epicondyl area, and in part, intra-articularly in the area of radio-humeral joint. According to literature data as well as experience, the drug effect and pain relief are expected within 6 to 12 hours following the drug administration. Full effect is expected after 24 hours. Usually, function

normalization and pain relief occur simultaneously. Thus, evaluation of treatment success may be performed during the first control follow-up. Also, each case may be individually and competently assessed. All the treatment procedures, pre- and post-treatment assessment as well as the results of any additional procedures are entered into adequate database and stored for subsequent professional and academic analysis (9). The data will be presented in Tables and Graphs.

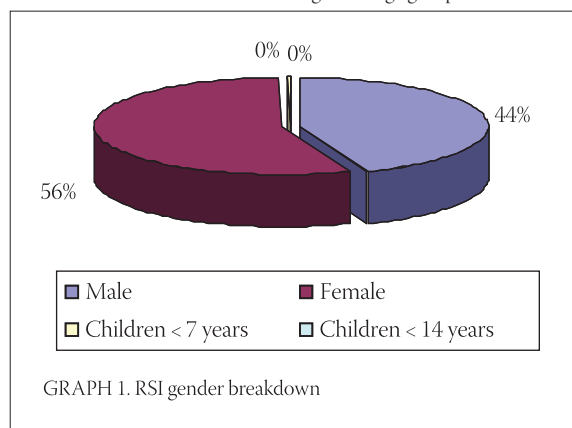
## RESULTS AND DISCUSSION

General representation of RSI fraction in the total pathology of CBR "Praxis" Sarajevo, observed in the form of 18 defined diagnoses, reached relatively high value of 11,51% or 2.422 patients. Of those, there were 223 patients with epicondylitis humeri radialis or 9,21% of the total number of RSI patients. Analysis of the RSI patients gender breakdown (Table 2, Graph 1) reveals slight dominance of female population (56%).

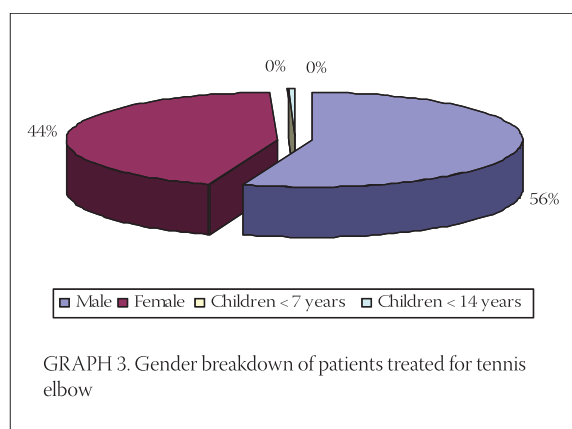
In the case of epicondylitis humeri radialis frequency of male patients is higher (55% : 45%).

00 to 07	08 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	>65
0	1	2	20	50	86	53	11

TABLE 3. Patients structure according to the age groups



GRAPH 1. RSI gender breakdown



GRAPH 3. Gender breakdown of patients treated for tennis elbow

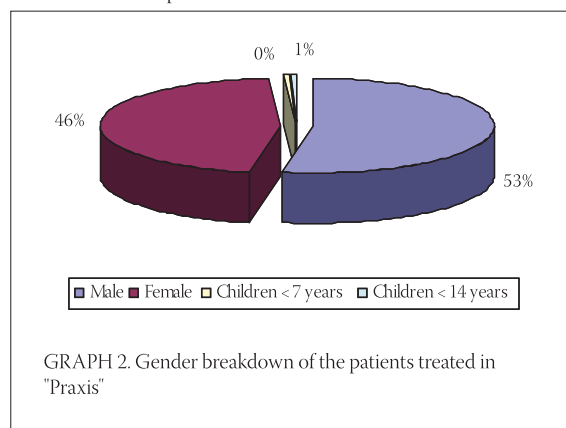
	RSI	Treated patients
	2.422	21.042
Patients structure		
Male	1.069	11.091
Female	1.346	9.738
Children < 7 years	4	78
Children < 14 years	3	135

TABLE 2. Structure of patient population treated at CBR "PRAXIS" over the previous 15 years

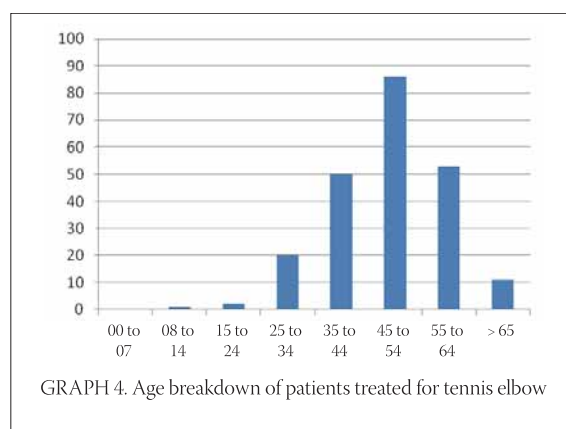
These two parameters, gender breakdown and pronounced pain in pre-treatment initial assessment motivated us to explore every aspect of this ailment. Following the evaluation and final assessment of functional condition, the analysis shows high level of success and fast recovery. In 93,7% patients functional ability was improved and pain reduced in 6 to 12 hours following the examination and local instillation of drug. In eight patients (3,58% cases) only the expected effect was lacking, thus physical therapy was included.

Grade	"0" zero	"1" one	"2" two	"3" three	"4" four	"5" five
Number of patients: Pre-treatment	0	0	55	142	26	0
Number of patients: Post-treatment	0	0	0	3	98	111

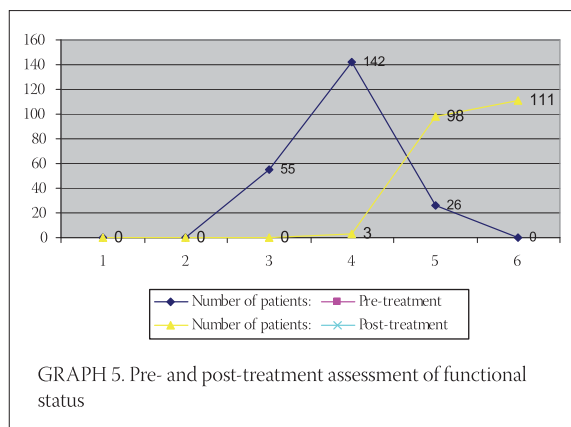
TABLE 4. Pre- and post-treatment assessment of functional status



GRAPH 2. Gender breakdown of the patients treated in "Praxis"



GRAPH 4. Age breakdown of patients treated for tennis elbow



Cost-benefit analysis showed higher efficiency of this treatment since 72% patients were able to return to work immediately after the first examination and one intervention. Practically, the total cost includes: the price of drug, examination by specialist, application of manual techniques and instillation. There is no loss of working hours in the employed patients. Expressed in value points it amounts to 80 points (1 point is a relative value defined in Federal

health insurance normative) which is 15 times less than when applying standard protocols. In the case of this ailment standard protocol proscribes the following steps:

1. Following the examination by family doctor and orthopedic specialist 7-10 days immobilization (cast) is usually applied along with analgesic drugs and sick leave,
 

2 initial examinations	30 points,
2 follow-up examinations	20 points,
application of immobilization	45 points,
analgesic drugs	10 points.
10 days disability one third of average wage	250 points.
14 days physical treatment	350 points
14 days disability one half of average wage	400 points
Three weeks of treatment and sick leave – total	1210 points.
- This calculation does not include contribution in working hours at the place of work. The value of this variable is not adequately assessed and cannot be applied in our conditions. In the USA this loss amounts to more than twice the individual wage.

## CONCLUSION

Elbow pain is the main symptom that is related to numerous microlocations within the joint itself, not only to the lateral epicondyl humeri for which it is named. Because of annular ligament and radius capitulum, elbow performs rotational movements along longitudinal joint axis in addition to flexion and extension. In our method, a major role belongs to manipulation as opposed to immobilization, which is major step in classic clinical method. It strives to achieve mobility of the joint, which is, at the moment of patients' first examination, functionally "blocked". Simultaneously, joint decompression and relaxation in the conjoint musculature are achieved which result in pain relief.

Following the manipulative therapy, additional instillation of corticosteroids reduces inflammation and contributes to overall physiological reintegration of function of this complex joint.

Our results suggest that the application of this method completely diminishes the need for surgical intervention. Also, the functional ability of elbow is, in majority of patients, fully restored.

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