



Original Article

Evaluation of patients submitted to the arthroscopic treatment of the lateral epicondylitis refractory to the conservative treatment[☆]

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ABSTRACT

Objective: to evaluate the results of the arthroscopic treatment of the lateral epicondylitis. **Methods:** we evaluated 14 patients (15 elbows) submitted to the arthroscopic treatment of the lateral epicondylitis refractory to the conservative treatment, which was realized for a minimum period of 18 months. Beyond the demographic data collection, patients were evaluated according to the arthroscopic classification of Baker et al., the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the Mayo Elbow Performance Score (MEPS). The patients' ages ranged between 23 and 56 years (average 46 years) (eight males and six females). Of the 15 elbows, 12 were the dominant and one patient had bilateral lesion. The follow-up after surgery was minimum 24 months and maximum 72 months (average 41 months).

Results: we found, according to the arthroscopic classification of Baker et al., two patients with type I lesions, nine with type II lesions and three with type III lesions. We found the following complications: one patient with altered sensitivity in the region of the lateral portal, one with a deficit of ten degrees in length, one with synovial plica and one with synovitis in the lateral compartment. Our score on the DASH questionnaire was minimum of 32 points and maximum of 120 points (average 57 points) and the scale of MEPS had a minimum score of 60 points and a maximum of 100 points (average 90 points).

Conclusion: the arthroscopic treatment of the lateral epicondylitis, plus insurance, provides satisfactory results.

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Avaliação de pacientes submetidos ao tratamento artroscópico da epicondilite lateral refratária ao tratamento conservador

R E S U M O

Palavras-chave:

Cotovelo de tenista/cirurgia
Cotovelo de tenista/complicações
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Artroscopia

Objetivo: avaliar os resultados do tratamento artroscópico da epicondilite lateral.

Métodos: foram avaliados 14 pacientes (15 cotovelos) submetidos ao tratamento artroscópico da epicondilite lateral refratária ao tratamento conservador, o qual foi feito por um período mínimo de 18 meses. Além da coleta de dados demográficos, os pacientes foram avaliados segundo a classificação artroscópica de Baker et al., o questionário Disabilities of the Arm, Shoulder, and Hand (DASH) e o Mayo Elbow Performance Score (MEPS). As idades dos pacientes variaram entre 23 e 56 anos (média de 46) e foram oito do sexo masculino e seis do feminino. Dos 15 cotovelos, 12 eram do membro dominante e um paciente tinha lesão bilateral. O seguimento após a cirurgia foi de no mínimo 24 meses e no máximo 72 meses (média de 41).

Resultados: foram constatadas, segundo a classificação artroscópica de Baker et al., dois pacientes com lesão do tipo I, nove com lesão do tipo II e três com lesão do tipo III. Encontramos as seguintes complicações: um paciente com alteração da sensibilidade na região do portal lateral, um com déficit de dez graus na extensão, um com plica sinovial e um com sinovite em compartimento lateral. Nossa pontuação no questionário DASH foi de no mínimo 32 pontos e no máximo 120 pontos (média de 57) e a escala de MEPS apresentou pontuação mínima de 60 pontos e máxima de 100 pontos (média de 90 pontos).

Conclusão: o tratamento artroscópico da epicondilite lateral, além de seguro, apresenta resultados satisfatórios.

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Introduction

Lateral epicondylitis, also known as “tennis elbow”, is a condition commonly found in medical practice. It affects between 1% and 3% of the population and is most frequent among individuals between 35 and 50 years of age. Although it was originally thought that this pathological condition was mostly associated with the act of playing tennis, the etiology of this pain in the lateral region of the elbow is more related to overuse or repetitive dorsiflexion and pronosupination exertion of the wrist. The diagnosis is made clinically through identifying it occupationally and from physical examination. Imaging examinations are rarely needed.^{1,2}

Lateral epicondylitis was first described by Runge in the German literature in 1873. The association with the game of tennis was suggested by Morris ten years later, which led to the term “tennis elbow”, although it also occurs in other racquet sports and in golf. Since then, there has been discussion regarding the causes, pathogenesis and possible treatments.¹⁻³

The pathogenesis of lateral epicondylitis is still a controversial matter, but it is known that not only the tendon of the extensor carpi radialis brevis (ECRB) muscle but also the annular ligament, lateral capsule, radial nerve and some bands of the tendon of the extensor digitorum communis muscle are involved.²

It was originally thought that the cause of lateral epicondylitis was an inflammatory process, which would then result in the symptoms. However, histological studies have demonstrated that, through repetitive injuries at the site, there is a degenerative process and a failure of repair in the

ECRB tendon. This is more pronounced than inflammation in other structures. The normal tissue of the ECRB tendon is invaded by immature fibroblasts and non-functioning vascular buds, thereby characterizing what today is called “angiofibroblastic degeneration”, which consists of fibroblastic and vascular responses that are more commonly referred to as tendinosis.²⁻⁴

There is still no consensus regarding the best approach to take in cases of lateral epicondylitis. Although it is a pathological condition with eminently conservative treatment, some patients present symptoms that are refractory to this treatment. In these cases, surgical intervention may be indicated, and this can be done by means of either an open or an arthroscopic technique. Arthroscopic treatment for lateral epicondylitis was described recently and presents the advantages of enabling tendon debridement without dividing the aponeurosis of the extensor digitorum communis, evaluation of intra-articular pathological conditions and, possibly, rehabilitation within a shorter period.⁵

Many studies have demonstrated the immediate success of surgical treatment for lateral epicondylitis. However, few have demonstrated the long-term results.³ The aim of the present study was to report the long-term results from arthroscopic surgical treatment in patients with lateral epicondylitis that was refractory to conservative treatment, focusing on the improvement of the state of pain and functionality of the elbow.

Materials and methods

This study had a cross-sectional observational design and was conducted by means of questionnaires and evaluation scales.

The research project was approved by the Research Ethics Committee of the Paraná Culture Association (Associação Paranaense de Cultura, PUC-PR), by means of the Brazil Platform, on May 22, 2012 (CAAE: 01542912.6.0000.0020).

Twenty patients with lateral epicondylitis that was refractory to conservative treatment, who were treated by means of arthroscopic surgery between August 2000 and October 2012, were identified. Of these patients, 16 were located to arrange interviews in an outpatient clinic and 14 came to the interviews, totaling 15 elbows.

The inclusion criteria were that there needed to be a clinical diagnosis of lateral epicondylitis, positive semiology and receipt of conservative treatment for a minimum of 18 months. Patients with neurovascular deficits, cognitive deficits or polyarthralgia, or who had undergone previous surgery on this joint, were excluded.

The following data were gathered: sex, age, dominant limb, operated limb, profession, symptoms before surgery, date of start of symptoms, previous treatment that had been instituted, duration of physiotherapy, number of glucocorticoid infiltrations, date of the surgery, complications from the procedure, postoperative complaints and range-of-motion measurements before and after the surgery.

The patients were classified surgically in accordance with the scale of Baker et al.⁶ into lesions of type I (intact joint capsule), type II (linear/partial capsule lesion) and type III (complete capsule lesion). During the interviews, the patients were asked to answer the DASH questionnaire and they were also assessed functionally by means of MEPS.⁷ They were also asked about their degree of satisfaction with the surgical result, through their response to being asked whether they would undergo the procedure again.

The results were analyzed descriptively using the Excel software to construct tables and graphs.

Surgical technique

Arthroscopy was performed with the patient in ventral decubitus, under intravenous and plexus anesthesia, with a tourniquet at the root of the limb. Cefazolin (1 g) was administered intravenously to induce anesthesia. Firstly, the bone and nerve structures of the elbow were identified and demarcated. Insufflation of the joint was performed by means of injection of 15 mL of physiological serum, and then an anteromedial portal was constructed in order to closely inspect the joint by means of 30° arthroscopy. Following this, the ECRB tendon was located, which made it possible to classify the lesion in accordance with Baker et al.⁶ (Fig. 1). An anterolateral portal was constructed under direct viewing, in order to insert the arthroscopy instruments, while the proximal anteromedial portal was used to insert the capsule retractor.

With the aid of a 5 mm shaver blade, the compromised tissue and the entire origin of the tendon were debrided. The insertion bed was then scarified (Fig. 2). After a further inspection of the joint, the portals were sutured using 3-0 monofilament thread. The operated limb was positioned flexed at 80° using a bag-type sling.

After the patient had recovered from anesthesia, mobility of the fingers and wrist were stimulated and the limb



Fig. 1 – Identification of the origin of the extensor carpi radialis brevis (ECRB).

remained immobilized for one week. After this period, the stitches were removed and the specialized physiotherapy work was started.

Results

Some of the data gathered are presented in Table 1.

The patients' ages ranged from 23 to 56 years (mean of 46). There were eight males and six females. Among the 15 elbows, 12 were on the dominant limb, one was on the non-dominant limb and one patient had bilateral injuries. The length of follow-up after the surgery was a minimum of 24 months and a maximum of 72 months (mean: 41). The main symptoms reported by the patients before the surgery were pain, edema, paresis and paresthesia.

The associated comorbidities included one case of tendinitis in the wrist flexors, one case of rotator cuff injury and one case of use of antidepressants.

In our sample, all the patients had previously been treated conservatively for a minimum of 18 months and a maximum of 72 months (mean: 30). The treatments instituted had included: relative rest, modification to daily activities, acupuncture, administration of non-steroidal anti-inflammatory drugs (NSAIDs), corticoid injections and physiotherapy. Six patients had undergone local infiltration, with an average of two applications per patient.

Complications were observed in 28.5% of the cases (one patient with local alterations of sensitivity in the region of the lateral portal, one with a deficit of 10 degrees of extension, one with a synovial plica and one with synovitis in the lateral

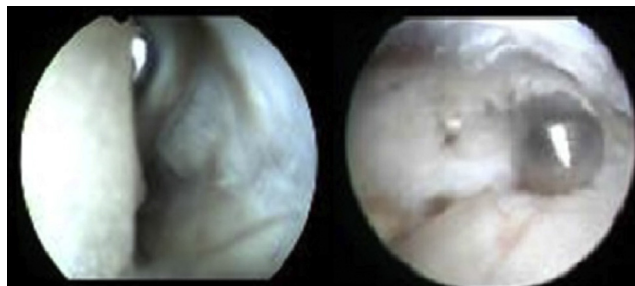


Fig. 2 – Photo of a Baker type II lesion, with debridement of this lesion being done.

Table 1 – Results obtained after outpatient assessment (n = 14).

Patient	Sex	Age (years)	Dominant limb	Side operated	Profession	Duration of previous treatment (months)
1	M	47	D	R	Security man	24
2	F	54	D	R	Seamstress	72
3	F	36	D	L	Till operator	24
4	M	50	D	R	Electrician	36
5	M	53	D	R and L	Electrician	18
6	M	44	D	R	Electrician	18
7	M	44	D	R	Metalworker	18
8	F	48	D	R	Teacher	24
9	F	23	D	R	Housewife	24
10	M	47	D	R	Stoneworker	24
11	F	56	D	R	Retired	60
12	M	51	D	R	Retired	18
13	M	54	D	R	Toolmaker	18
14	F	37	D	R	Cook	24

Patient	ROM before	ROM after	Baker	MEPS	DASH	Would you go through this again?
1	No abnormalities	No abnormalities	I	100	32	Yes
2	No abnormalities	No abnormalities	II	85	85	No
3	No abnormalities	No abnormalities	II	85	120	Yes
4	No abnormalities	No abnormalities	III	85	65	Yes
5	No abnormalities	No abnormalities	II	85	67	Yes
6	No abnormalities	No abnormalities	II	100	41	Yes
7	No abnormalities	Deficit of 10 degrees of extension	III	80	70	Yes
8	No abnormalities	No abnormalities	III	85	52	Yes
9	No abnormalities	No abnormalities	II	60	86	No
10	No abnormalities	No abnormalities	II	100	39	Yes
11	No abnormalities	No abnormalities	II	100	36	Yes
12	No abnormalities	No abnormalities	II	100	35	Yes
13	No abnormalities	No abnormalities	II	100	38	Yes
14	No abnormalities	No abnormalities	I	100	36	Yes

M, male; F, female; R, right; L, left; ROM before, range of motion before operation; ROM after, range of motion after operation; MEPS, Mayo Elbow Performance Score; DASH, Disabilities of the Arm, Shoulder and Hand.

compartment). No cases of infection or persistent drainage at the access portals were observed.

Regarding the postoperative complaints, only three patients reported having local pain.

According to the classification of Baker et al.,⁶ there were two patients with type I lesions, nine with type II and three with type III. Our scoring from the DASH questionnaire was a minimum of 32 points and a maximum of 120 points (mean: 57), and the MEPS scores ranged from a minimum of 60 points to a maximum of 100 points (mean: 90).

Discussion

Despite the advances already achieved in relation to the etiopathogenesis of lateral epicondylitis, there is still no consensus regarding its management.³ In most cases, the symptoms of lateral epicondylitis are effectively resolved through rest, modification of physical activities, use of NSAIDs and physiotherapy. New types of treatment include extracorporeal shockwaves, laser application, filament light therapy and injections of platelet-rich plasma.^{1,2,8}

Only a few cases (around 8%) present pain that is refractory to the abovementioned measures. After six months of ineffective conservative treatment, surgical intervention is then

indicated. This may be undertaken through an open, percutaneous or arthroscopic approach.^{1,8} Although six months of conservative treatment is recommended in the literature, we chose in our study to maintain this treatment for a minimum of 18 months because of difficulty in starting and following up physiotherapy in the healthcare system.

The majority of the surgical procedures follow the same principle, consisting of debridement or release of the origin of the ECRB tendon.^{1,5} Open surgical intervention presents good results, but fails to identify associated intra-articular lesions, which are present in 11–69% of the patients.⁹ Moreover, open surgery carries risks of ligament injuries, which may lead to elbow instability.¹⁰

Currently, the following are indications for arthroscopic surgery on the elbow: debridement of osteochondritis dissecans; debridement and repair of lateral epicondylitis; debridement in cases of pan-articular or radiocapitellar arthritis; plica and other types of synovitis; septic arthritis; removal of foreign bodies; instability (varus, valgus or posterolateral); and fractures of the radial head, capitulum and distal humerus. Lesions of the triceps tendon, bursitis of the olecranon, cubital tunnel syndrome and fractures of the coronoid are considered to be relative indications of varus and posterolateral rotational instability.^{2,11}

The arthroscopic technique enables good viewing of the elbow joint and the pathological conditions that may exist. However, this technique takes a long time to perform and surgeons require training and experience in order to achieve good results. The procedure presents results that are similar to those from conventional techniques but, as reported by studies in this regard, the failure rate is lower and an early return to activities is enabled.⁸

In accordance with the surgical classification of Baker et al., it was found that two patients had type I lesions, nine had type II lesions and three had type III lesions. In the patient with bilateral lesions, both of them were type II. This shows that partial capsule-tendon lesions were the most frequent occurrence in our sample, which was probably because of the activities performed by our patients. Studies have indicated that there is no relationship between the type of lesion and the postoperative clinical-functional evolution.^{5,6} This type of relationship was also not found in our results.

In other studies that made evaluations using MEPS scores, the results were similar to ours. Kim et al.⁴ divided 38 patients who underwent the procedure according to the technique used: 19 patients who underwent debridement and release of the ECRB and another 19 who only underwent release. Both groups presented a mean of 40 points on MEPS. The study by Baker et al.⁶ included a population of 40 patients (42 elbows) who underwent operations using the technique in question. Out of this total, 37 patients (39 elbows) were followed up. Of these, 13 patients who returned for a subjective clinical examination presented a mean of 93.6 points. In an analysis on eight patients who underwent arthroscopy, Zoppi Filho et al.¹⁰ found scores greater than 90 points. Our scores ranged from a minimum of 60 points to a maximum of 100 points (mean of 90), which corroborates the data in the literature in relation to satisfactory functional results.

The results from the DASH questionnaire found in the literature are promising. Othman⁸ divided 33 patients with lateral epicondylitis into two groups: one with 14 patients who underwent arthroscopy and one with 19 patients who underwent a percutaneous technique. The scores from the DASH questionnaire were evaluated before and after surgery and the results were found to be significant ($p < 0.05$). In the first group, the score improved from 72 to 48 points, and in the second, from 70 to 50 points. Comparing the postoperative scores in the two groups, there was no significant difference ($p = 0.5002$). In a study on 18 patients who underwent arthroscopic operations, Wada et al.¹² used the Japanese Hand Surgery Society's version of the DASH questionnaire. From analysis on their results, these authors observed that there were two factors relating to worse results from the questionnaire. The first was low T2 signal at the origin of the ECRB on preoperative magnetic resonance imaging, and the second was receipt of public assistance. Our patients presented a minimum score of 32 points and a maximum of 120 points (mean: 57), which was also similar to the results from other studies.

According to the studies reviewed, most patients who underwent the procedure declared that they were satisfied with the results from the surgery. Baker and Baker found that 28 (93%) of their 30 patients said that they would undergo the surgery again.³ In a postoperative analysis on 20 patients with a mean follow-up of 20 months, Miyazaki et al.⁹ found that

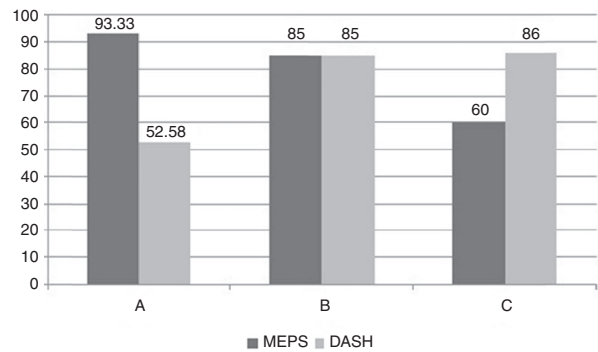


Fig. 3 – Scoring for patients on the MEPS and DASH scales according to their responses relating to whether they would go through this operation again. (A) Mean number of patients who answered “yes”; (B) and (C), scores of the two patients who answered “no”. MEPS, Mayo Elbow Performance Score; DASH, Disabilities of the Arm, Shoulder and Hand.

only one patient was dissatisfied with the results, and this was because the patient presented reflex sympathetic dystrophy as a surgical complication. With a mean follow-up of 14 months, Zoppi Filho et al.¹⁰ found that their eight patients were satisfied with the results. Latterman et al.⁵ reported that, out of 32 patients with a mean follow-up of 3.5 years, 20 (63%) would undergo the surgery again. These data show that the technique used presented satisfactory clinic results for the patients, particularly regarding pain control.

Our study, in agreement with those reviewed, also found that the majority of the responses were positive with regard to satisfaction. Twelve patients (85%) said that they would undergo the procedure again and only two (15%) responded negatively. However, the functional evaluation scores of these patients after the surgery did not justify their dissatisfaction and, thus, no explanation could be found for their responses on the basis of the results from the procedure (Fig. 3).

The possible complications after the procedure are rare and consist of neurovascular lesions, posterolateral ligament lesions, hematomas and infection of the surgical wound.⁸ Most studies have not reported any complications.^{6,9,10,12,13} In an analysis on 18 patients operated using this technique, Cumins¹⁴ also did not report any complications, but this author's histological analysis showed microscopic findings of residual tendinopathy in ten patients. Latterman et al.⁵ had one patient who presented paresthesia in the forearm for two weeks after the surgery, with spontaneous resolution. In our sample, we found a complication rate of 28.5% (one patient with local alterations of sensitivity in the region of the lateral portal, one with a deficit of 10 degrees of extension, one with a synovial plica and one with synovitis in the lateral compartment). Nonetheless, the procedure was shown to have low morbidity rates if performed by a trained professional.

Latterman et al.⁵ considered that the technique presented adequate pain relief results, but ten of their patients (31%) presented discomfort during vigorous exercise and two (6%) presented significant pain during daily activities. They considered that these later patients were surgical failures. Baker

et al.⁶ demonstrated that only 10% of their patients presented pain during their daily activities. Cummins¹⁴ made a comparison between pre and postoperative pain among their patients, by means of some pain categories. Among their 18 patients, only two did not present a postoperative improvement of pain, and this was related only to the category of “worst pain level”. This author concluded that this result occurred in patients who presented residual microscopic disease. All the eight patients in the study by Zoppi Filho et al.¹⁰ evolved without pain and without any limitation of range of motion. In our sample, only three patients reported having local pain.

Conclusion

We conclude that arthroscopic treatment of lateral epicondylitis presents low morbidity, which makes it safe, and good resolution capacity, which enables improvement of the state of pain and functionality of the elbow.

Conflicts of interest

The authors declare no conflicts of interest.

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