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Evaluation of surgical outcome of cubital tunnel syndrome

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Abstract

Background: The ulnar nerve may be compressed in several points along its path, but the most frequent location is at the level of the elbow, known as cubital tunnel syndrome.

Objective: The description of the clinical results obtained in 61 ulnar neuropathies operated (59 patients) with this surgical technique.

Results: The average age of the patients was 44.8 ± 6.5 years, 61 elbows were operated on 59 patients, 25 male (42.4%) and 34 female (57.6%). The left elbow was operated in 43 cases (70.5%) and right in 18 (29.5%). Two women in the current study undergo operation for both elbows and grade II found in 25 cases. Open in situ decompression is the most common type of surgery 42 patients, in which 17 (40.5%) were males and 25 (59.5%) were females. The subcutaneous transposition was 8 when males represents 6 (75.0%) of the patients, and only 2 (25.0%) were females, 6 patients were treated by medial epicondylectomy when equal number for both gender were found, and only (5.1%) were treated by sub-muscular transposition.

Conclusion: Open in situ decompression is the most common surgical procedure especially in female in Cubital tunnels syndrome surgery.

Keywords: Cubital tunnels syndrome, Open in situ decompression, ulnar nerve, subcutaneous transposition

Introduction

The entrapment of the ulnar nerve is the second common compression neuropathy in the upper extremity after the syndrome of the carpal tunnel [1, 2]. The ulnar nerve may be compressed in several points along its path, but the most frequent location is at the level of the elbow, known as cubital tunnel syndrome. In United State the incidence of this pathology is about 75,000 cases a year, showing a slight predilection for the male sex with a ratio of 2 to 1 [2, 3]. While in the worldwide is estimated at 25 cases per 100,000 person-years, affecting men twice as frequently as women [4].

This disease causes an important morbidity in patients regarding the activities of daily life and occupational activities [5]. The causes of this pathology can be multiple: post-traumatic injuries, Elbow deformities and soft tissue masses, among others. However, more commonly, it has been shown that the occupational factor play a very important role in the development of the cubital tunnel syndrome [6].

The reason for consultation is usually Paresthesia's in the territory of distribution of the ulnar nerve and weakness or atrophy of the intrinsic muscles of the hand. Although pain is not the predominant feature in the course of the disease, at least in initial stages, in the sports environment we must make a differential diagnosis with the epitrocleítis or elbow of golfer, without forgetting that ulnar neuropathy it is associated with epitrocleítis in approximately 20% of cases [7].

History

The vulnerability of the ulnar nerve at the elbow described since late 1800 [8, 9]. During the early part of this century, it was thought that the ulnar nerve neuropathy occurred by a traumatic, usually as a result of supracondylar fractures, arthritis or subluxations [10].

The diagnosis was referring at that time to a friction or traumatic neuritis. A simple decompression channel described in early 1897 [11], but the first reports only focused on correcting deformities involucra-days. In 1958, Feindel and Stratford introduced the term "cubital tunnel syndrome" and focused on the anatomy of the elbow region, linking it to compression of the ulnar nerve. While Osborne described the tedious limit ulnar is was an important point of compression. At present it has become popular nerve transposition [12].

Objectives

The description of the clinical results obtained in 61 ulnar neuropathies operated (59 patients) with this surgical technique.

Material and Method

This is a prospective cross sectional study carried on 2 major Teaching Hospitals (Al-Wasity Teaching Hospital and Al-Kindy Teaching Hospital) in which a personal series of 61 elbows operated with a Cubital tunnel syndrome is analyzed, from the first of January 2016 until the end of December 2016 (1 year). Electroneuromyography (ENMG) is the reference examination. Clinical findings included sensory disturbance in the ulnar nerve-innervated distribution and motor dysfunction induced by intrinsic muscle atrophy. Antero-posterior and lateral digital radiographs of the elbow were routinely conducted.

Surgical treatment

Surgery is indicated when conservative treatments do not improve the symptoms. They have described several different treatments such as Decompression on-site, which decompresses only the cubital tunnel leaving out other possible areas of compression. The medial traction given epicondylectomy removes the nerve in its course around the epicondyle, especially with the elbow flexed. Cubital tunnel release can work median- you endoscopy, with which incisions are minimal, but there is a difficulty in terms of technique and materials needed to perform the surgery.

The goal of surgery is to move the nerve transposition above the axis of elbow flexion, reducing nerve stress. In addition, by removing the nerve tunnel it is removed the pressure caused by the decrease of volume of the tunnel during flexion. For these surgeries one more incision is necessary that the release on-site.

There is concern that the vascularity of nerve to make the transposition is decreased. It pays special attention to new sites not produce pressure to perform nerve transposition.

The septum intramuscular is removed so it does not become a site to transpose pressure. The nerve is released cubital tunnel and continues distally through the two bellies of the flexor carpi ulnaris. Already released the nerve, the rearrangement is conducted tending motor branches of the flexor carpi ulnar is and deep flexor fourth and fifth fingers, and at this time, the rib may be positioned subcutaneous, sub muscular or intramuscular, depending on preferences surgeon

Ethical consent

All ethical approval was obtained prior to initiation of the study. After ensuring confidentiality and anonymity we illustrating the study purpose and importance to all patients and their verbal consents were obtained prior to data collection.

Statistical analysis: All persons' data entered using computerized statistical software; Statistical Package for Social Sciences (SPSS) version 25 was used. Descriptive statistics presented as (mean \pm standard deviation) and frequencies as percentages. Multiple contingency tables conducted and appropriate statistical tests performed, Chi-square test used for categorical variables The results were evaluated based on a 95% confidence interval at a significance level of $p < 0.05$.

Results

The overall average age of the patients enrolled was 44.8 ± 6.5 years, 61 elbows were operated on 59 patients, 25 male (42.4%) and 34 female (57.6%). The left elbow was operated in 43 cases (70.5%) and right in 18 (29.5%). Two women in the current study undergo operation for both elbows. Of the 59 patients operated, 32/59 (54.2%) had low functional demand occupations, 14/59 (23.7%) low or moderate work efforts, and only a fifth 13/59 (22.1%) had major work efforts. Of the 41 patients were employed, 7 were retired 6 were not employed and 5 were students.

16 cases showed grade I, grade II 25 cases and 18 cases grade III. In all patients with grade I was waiting a reasonable time after the appropriate advice on postural support measures and elbow.

Table 1: Demographic criteria of the studied group

Variable		No.	%
Gender	Male	25	42.4%
	Female	34	57.6%
Age	< 40	9	15.3%
	40-49	19	32.2%
	≥ 50	31	52.5%
Mean age= 44.8\pm6.5 years			
Work efforts	Low	32	54.2
	Moderate or medium efforts	14	23.7
	High (major efforts)	13	22.1
Occupation	Employee	41	69.5
	retired	7	11.9
	Not employee	6	1.0
Preoperative McGowan grade	Students	5	8.5
	I	16	27.1
	II	25	42.4
	III	18	30.5

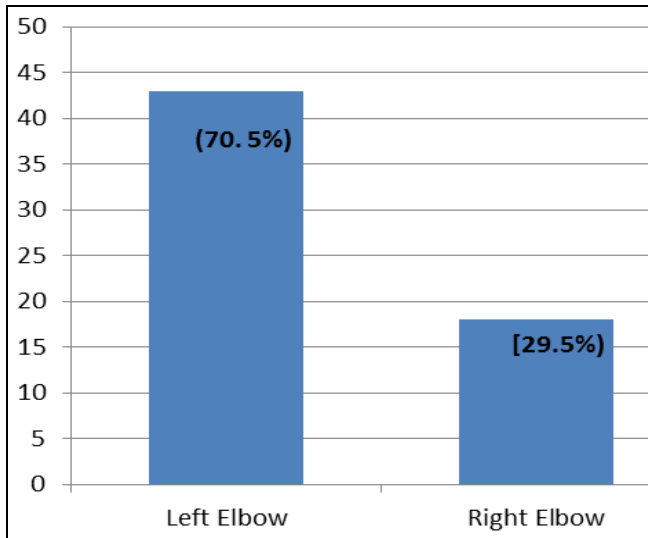


Fig 1: Side of elbow

As shown in table 2, the open in situ decompression is the most common type of surgery 42 patients, in which 17 (40.5%) were males and 25(59.5%) were females. The subcutaneous transposition was 8 when males represents 6 (75.0%) of the patients, and only 2(25.0%) were females, 6 patients were treated by medial epicondylectomy when equal number for both gender were found, and only (5.1%) were treated by sub-muscular transposition.

Table 2: Type of primary surgery

Type of primary surgery	Male		Female		Total	
	N	%	N	%	N	%
Open in situ decompression	17	40.5	25	59.5	42	100.0
Medial epicondylectomy	3	50.0	3	50.0	6	100.0
Subcutaneous transposition	6	75.0	2	25.0	8	100.0
Intramuscular transposition	1	33.3	2	66.7	3	100.0

Table 3 show, that there is change in McGowan grade, in which the grade was decreased postoperatively in the studied group in comparison with preoperative McGowan grading. After surgery (59%) of the patients were improved, (33.9%) with no change and (6.8%) become worse.

Table 3: Final McGowan Grading According to Patient Group

Final McGowan grade		
	No.	%
0	16	27.1
I	20	33.9
II	13	22.0
III	10	17.0
Change in McGowan grade after surgery		
Improved	35	59.3
No change	20	33.9
Worse	4	6.8

Discussion

Conservative treatment of Cubital tunnel syndrome is fundamentally based on maintaining the elbow semi extension using night orthosis [13, 14]. Its effectiveness is scarce and is reserved for cases of mild impairment or when there contraindications for surgical decompression.

Macadam *et al.* after comparing the results in 906 patients who underwent 449 were simple decompression, subcutaneous transpositions 342 and 115 submuscular transpositions found no

statistically significant differences [15]. Several authors argue the same criteria: Brauer and Graham They compared the advantages and disadvantages of the four treatments modalities in a comprehensive literature review concluding that the best surgical option in moderate and severe compression is simple decompression [16].

Chung He admits to having abandoned its practice of performing transpositions in favor of simple decompression [17]. Bimmler and Meyer After dividing 79 patients in two series of 31 single and 48 decompression with submuscular transposition supporters of simple decompression except shown in cases where those who appreciate tendency to subluxation after decompression, in which case they are indicated above transposition (remember that Childress eleven He described the existence of subluxation or dislocation in habitual 16.2% of the general population) [18].

Nabhan *et al.* [19] in a study of 66 patients found no significant differences between 32 and 34 simple decompression previous transpositions Subcutaneous, so advise the mere decompression, nor are differences Charles *et al.* 49 treated patients, 25 with and 24 submuscular transposition subcutaneous transposition. [20]

In the present study the data of 61 elbows operated with a technique that avoids exposed comprehensive surgical treatment includes various different techniques, almost always simple decompression epitrocleares osteotomies or above transpositions. The result of these techniques and the various modifications described in each show is still far from reaching a consensus on the ideal technique.

In this study of 61 elbows operated there were only two bilateral cases (4%). No abound in the literature data on bilateralism of Cubital tunnels syndrome. In the series of Nathan 102 cases were operated in 74 patients, representing 28 (37.8%) bilateral surgeries [21].

In general, the point of nerve compression manifests macroscopic changes in the appearance or coloration. Often show a significant nerve pallor in the compression zone, caused by ischemia caused the vasa nervorum, and congestion and hyperemia in the proximal area to the area In the present study the most common compression zone found in the section that runs from the proximal edge of the ligament to epitrocleo-olecraneano dissection own nerve transpositions, with the consequent deterioration of the neural vasculature, as well as the risk of recurrent subluxation simple decompression and complications of epitrocleares osteotomies (disorders of Pronato flexor muscle, bleeding in the nervous bed with subsequent fibrosis per neural, etc.).

Some authors like Charles [22], Gleeman [23] and As V *et al.* [24], used similar to that described to prevent lateral movement of taenia nerve, but once made the previous transposition. Rochet *et al.*, reconstruct epitrocleo-olecranon sheave and leave the nerve in its bed, but after making an epitrocleotomía [25].

Mean age was similar to Svernlöv *et al.* study [14] (43 years) and Nathan [17] 44.4 years) and somewhat lower than those of Charles [22] (49.5 years), Kohut (49 years and 11 months) [26].

Conclusion

Open in situ decompression is the most common surgical procedure especially in female in Cubital tunnels syndrome surgery.

Conflicts of interest

The authors declare not to have any conflicts of interest.

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