



## Factors that have an influence on cubital tunnel syndrome and its treatment: assessment of 31 cases

### Kubital tünel sendromuna etki eden faktörler ve tedavisi: 31 olgunun değerlendirilmesi

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#### Abstract

**Objective:** The purpose of this study was to evaluate the factors which influenced Cubital Tunnel Syndrome and the cases that were treated.

**Materials and Methods:** 34 hands of 31 cases who had been treated (operated/non-operated) between January 2011 and January 2016 due to Cubital Tunnel Syndrome and who had sufficient follow-ups were included in the study. The cases were analyzed in terms of their clinical and demographic characteristics. The data obtained were analyzed through SPSS system. Shapiro-Wilk test was used to find out whether the data were normally distributed. The data which were normally distributed were expressed as average±standard deviation and those which were not normally distributed were expressed as mean (min-max).

**Results:** 18 (58.1%) of the cases were women, while 13 (41.9%) were men and the average age was 43.54±16.50 years. The majority of the cases consisted of workers (12-38.7%) and housewives (11-35.5%). 6 (19.4%) cases had hypertension, 3 (9.7%) cases had diabetes, 3 (9.7%) cases had hyperlipidemia and 3 (9.7%) cases had metabolic syndrome. Entrapment was located at the left elbow in 21 (61.8%) cases, at the right elbow in 13 (38.2%) cases, at the dominant extremity in 15 (44.1%) cases, and located 2 cm. up in 21 (61.8%) cases and 2 cm. down in 10 (29.4%) cases. 3 (9.7%) cases who did not respond to conservative treatment and who had advanced stage symptoms and complaints were operated. Improvement was seen in the cases who were followed for an average of 15 (3-60) months.

**Conclusion:** According to the results of the study, we are of the opinion that treatment success will increase by planning the treatment after finding out the factors that influence Cubital Tunnel Syndrome.

**Keywords:** Cubital Tunnel Syndrome; Characteristic; Treatment; Operative; Nonoperative.

#### Öz

**Amaç:** Çalışmamızda Kubital Tünel Sendromu nedeni ile opere/nonopere tedavi edilen olguların özellikleri ile etki eden faktörlerin değerlendirilmesi amaçlandı.

**Gereç ve Yöntemler:** Ocak 2011 ile Ocak 2016 yılları arasında Kubital Tünel Sendromu nedeniyle opere/nonopere tedavi edilen ve yeterli takipleri olan 31 olgunun 34 eli çalışmaya dahil edildi. Olgular klinik ve demografik özellikleri açısından incelendi. Elde edilen veriler SPSS sistemine yüklenerek analiz edildi. Verilerin normal dağılıma uyup uymadığı Shapiro-Wilk testi ile değerlendirildi. Elde edilen veriler içerisinde normal dağılıma uyan veriler ortalama±standart sapma şeklinde, normal dağılıma uymayan veriler ise ortanca (min-max) şeklinde ifade edildi.

**Bulgular:** Kubital Tünel Sendromu tanısı alan olguların 18'i (%58.1) kadın, 13'ü (%41.9) erkek olup yaş ortalaması ise 43.54±16.50 yıl idi. Tanı konulan olguların çoğunluğu işçilerden (12-%38.7) ve ev hanımlardan (11-%35.5) oluşmakta idi. Serimizdeki 6 (%19.4) olguda hipertansiyon, 3 (%9.7) olguda diyabet, 3 (%9.7) olguda hiperlipidemi ve 3 olguda (%9.7) metabolik sendrom mevcuttu. Ulnar sinirin tuzaklanması 21 (61.8) olguda sol dirsekte, 13 (%38.2) olguda sağ dirsekte, 15 (%44.1) olguda dominant ekstremiteye ait dirsekte, 21 (61.8) olguda dirsek üst 2 cm. ve 10 (%29.4) olguda dirsek alt 2 cm. yerleşimli idi. Konservatif tedaviye cevap vermeyen ileri evre semptom ve şikayetleri olan 3 (%9.7) olgu opere edildi. Kubital Tünel Sendromu tanısı ile tedavi sonrası ortalama 15 (3-60) ay takip edilen olgularda iyileşme gözlemlendi ve herhangi bir olumsuz komplikasyon ile karşılaşmadı.

**Sonuç:** Yapmış olduğumuz araştırmadan elde edilen sonuçlara göre, Kubital Tünel Sendromu tanısı konulan olguların özellikleri ve etki eden faktörler göz önüne alınarak yapılan uygun opere/nonopere tedavi planlanması ile tedavi başarısının artacağı kanaatindeyiz.

**Anahtar Kelimeler:** Kubital Tünel Sendromu; Karakteristik; Tedavi; Operatif; Nonoperatif.

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## INTRODUCTION

Ulnar nerve can be entrapped at different levels throughout its course and this situation can be seen most frequently at elbow, wrist, forearm, arm, and axillary area (1). Cubital Tunnel Syndrome, which occurs as a result of the entrapment of ulnar nerve at cubital fossa, is the most common entrapment neuropathy in the upper extremity after Carpal Tunnel Syndrome (2). Its frequency has been reported as about 25 per 100.000 (3,4). A great number of reasons are considered to be responsible for its etiology. The diagnosis is made through anamnesis, physical examination and electromyography (EMG) (4). Conservative methods should be considered first in treatment, surgical treatment should be planned in cases who do not benefit from conservative treatment (1).

In our study, cases who were treated (operated/non-operated) due to Cubital Tunnel Syndrome and factors were assessed in line with the literature.

## MATERIALS and METHODS

34 hands of 31 cases who had been treated (operated/non-operated) between January 2011 and January 2016 due to Cubital Tunnel Syndrome and who had sufficient follow-ups were included in the study. The cases were analyzed retrospectively after informed consent form and permission were taken from the participants and the local ethical board. The cases were assessed in terms of age, gender, height, weight, occupation, place of residence, comorbid diseases, the lesion's direction, the lesion's location and the type of treatment. The neural integrity of all the cases was complete and they did not have any anatomical pathology.

### Statistical Analysis

The data obtained were analyzed with SPSS 15.0 (SPSS Inc., Chicago, IL, USA) program. Shapiro-Wilk test was used to assess whether the data were normally distributed. The data which were normally distributed were expressed as average±standard deviation and those which were not normally distributed were expressed as mean (min-max).

## RESULTS

18 (58.1%) of the cases were women, while 13 (41.9%) were men and the average age was  $43.54 \pm 16.50$  years. The average height of the cases was  $167.80 \pm 5.99$  cm. while their average weight was  $71.3 \pm 8.81$ . 12 (38.7%) of the cases were workers, 11 (35.5%) were housewives, 3 (9.7%) were officers, 3 (9.7%) were students and 2 (6.5%) were unemployed. 23 (74.2%) cases lived in the town center, while 8 (25.8%) lived in the village.

6 (19.4%) cases had hypertension, 3 (9.7%) cases had diabetes, 3 (9.7%) cases had hyperlipidemia and 3 (9.7%) cases had metabolic syndrome. Entrapment was located at the left elbow in 21 (61.8%) cases, at the right elbow in 13 (38.2%) cases, at the dominant extremity in 15 (44.1%) cases, and located 2 cm. up in 21 (61.8%) cases and 2 cm. down in 10 (29.4%) cases. The involvement was bilateral in 3 of the cases. 3 (9.7%) cases who did

not respond to conservative treatment and who had advanced stage symptoms and complaints were operated (Figure 1). Improvement was seen in the cases who were followed for an average of 15 (3-60) months.



**Figure 1.** a). intraoperative view of 40 year-old male case with elbow osteophytes because of osteoarthritis, b). preoperative lateral graph, c). preoperative posterior-anterior graph.

## DISCUSSION

Ulnar nerve is the main branch of the medial cord formed by C8-T1 roots of brachial plexus and it passes through the cubital tunnel which is a fibroosseous rigid anatomical structure behind the medial epicondyl of the elbow. Since the ulnar nerve is superficial here, neuropathy frequently occurs at this level (1).

While recurrent pressure and trauma frequently play a role in its etiology; local and systemic factors such as fractures, synovitis that develop due to rheumatic diseases, osteophytes due to osteoarthritis, benign and malignant masses, bone and anomalies, metabolic diseases and anatomic variations also play a role (1,5,6). In their study, Warner et al. (7) reported that male gender and body mass index were risk factors. 41% of our cases who developed Cubital Tunnel Syndrome due to various reasons were men and only 3 were found to have high body mass index. Whatever the reason, the last manifestation has been argued to be dependent on ischemia (7). So we planned to evaluate the treatment of our patients according to their risk factors.

Clinically, tingling, numbness and weakness is seen on the ulnar part of the hand; while increase in paresthesia, and claw toe and hypothenar-interosseous-thenar atrophy due to weakness and loss of force in the related muscles are seen in advanced nerve entrapment (5,8). Similar complaints were also available in our cases.

The diagnosis of the disease is made through anamnesis, physical examination and EMG. The patient's symptoms and the symptom's durations are asked with anamnesis. In physical examination, elbow flexion test is the most diagnostic test (9). In addition, tinel test and froment's sign positivity are used (10). EMG has a great participation like in all neuropathies. Decrease in sensory and motor action potential amplitude, prolong distal

latency and slowness in speed of transmission is seen. In addition, electrophysiological localization of the lesion area in patients with ulnar nerve neuropathy has been reported to be more difficult than Carpal Tunnel Syndrome, which is the most frequent entrapment neuropathy (10). In our study, we diagnosed our patients with physical examination and EMG.

C8-T1 radiculopathies, brachial plexopathies, thoracic outlet syndrome, mononeuritis multiplex and other neuropathies should be considered in definitive diagnosis of Cubital Tunnel Syndrome (11).

The treatment consists of conservative or surgical treatment. Conservative treatment should be considered first in the early stages of the disease and in cases without neurological deficit (5). Conservative methods such as splint use which aims to avoid long term elbow flexion, removing the factors which put pressure on nerves and medical treatment can be tried. When patients fail to respond to conservative treatment for 6 to 12 weeks, have persistent severe symptoms or present with intrinsic muscle atrophy, operative management should be considered (5,11,12). Simple open-arthroscopic decompression, medial epicondylectomy and transposition (anterior subcutaneous, anterior intermuscular and anterior submuscular) are among treatment choices (12,13). We operated our three cases surgically through anterior subcutaneous method due to no benefit from conservative treatment and advanced symptoms. We did not encounter any complications at this stage. In the follow-ups, recovery was seen in all patients who were treated operated-non-operated.

The limitations of our study are limited numbers of patients, independently factors on Cubital Tunnel Syndrome, retrospective and done-center design of the study.

## CONCLUSION

According to the results of the study, we are of the opinion that treatment success will increase by planning the treatment after finding out the factors that influence Cubital Tunnel Syndrome. So we can achieve satisfactory results with this approach.

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