J Turgut Ozal Med Cent 2017;24(1):34-6
ORIGINAL ARTICLE DOI: 10.5455/jtomc.2016.11.117

# Is clinical evaluation sufficient enough to diagnose the cubital tunnel syndrome?

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**Abstract**

**Aim:** The aim of the study was to determine the diagnostic value of clinical history and neurological examination for cubital tunnel syndrome.

**Materials and Methods:** 132 limbs of 128 patients treated with electromyography with a preliminary clinical diagnosis of cubital tunnel syndrome between the years of January 2009 and January 2016 were evaluated. Patients were evaluated according to gender, affected side and electromyography results to assess the presence of neuropathy. The obtained data were statistically analyzed by Kormogonov-Smirnov and Shapiro-Wilk test.

**Results:** 70 patients (54%) were male and 58 (46%) were female and the average age was 40.25±12.66. The affected side was right extremity in 70 (53%) of cases and left extremity in 62 (47%) who underwent electromyography with a preliminary diagnosis of neuropathy. Symptoms were bilateral in 4 cases. As a result of electromyography 43 (32.6%) (27 male, 16 female) patients had neuropathy. Affected side in 23 of these patients (53.5%) was left limb and 20 (46.5%) was right limb and 30 of involved patients were in the range of 30-60 years.

**Conclusion:** According to the results of our study, we found that history and neurological examination have a low efficiency in the diagnosis of cubital tunnel syndrome. This may be associated with relatively subjective evaluation of neurological examination and history and also many pathologies in the differential diagnosis of cubital tunnel syndrome. We believe that electromyelography application is required in addition to a detailed physical examination for cubital tunnel syndrome in order to avoid delayed diagnosis and incomplete/incorrect treatment.

**Keywords:** Cubital Tunnel Syndrome; Diagnosis; Physical Examination; electromyography.

## INTRODUCTION

Ulnar nerve entrapment called cubital tunnel syndrome (CuTS) is the second most commonly seen entrapment neuropathy after carpal tunnel syndrome. The mean annual incidence rate is 25 cases per 100.000 person-years, with males being affected almost twice as often as females (1).

CuTS is of multifactorial origin and mostly arises in the elbow region. Internal and external reasons may be the reasons of focal entrapment. Although the most common etiology is idiopathic; repetitive trauma, overuse, bone pathology, chronic diseases, connective and soft tissue disorders may be the reasons for etiology (2-5). Patients generally notice numbness and tingling about the ring and small fingers that often associated with medial elbow or proximal forearm pain (6). Clinical examination and electromyography (EMG) are most commenly used for differencial diagnosis of upper extremity (7-9). Many conservative and surgical methods have been defined for the treatment of CuTS. The symptoms of the CuTS are usually insidious in onset particularly when the neuropathy is related to repetitive activities. Correct differential diagnosis and complete treatment is very important for the patient satisfactory. In this study we aimed to determine the diagnostic value of clinical history and neurological examination for CuTS.

Received: 11.11.2016
Accepted: 07.12.2016

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## MATERIALS and METHODS

132 limbs of 128 patients treated with EMG with a preliminary clinical diagnosis of CuTS between the years of January 2009 and January 2016 were evaluated. Patients were diagnosed with CuTS by a history and clinical examination that were positive for numbness and tingling in an ulnar nerve distribution, with or without weakness in ulnar nerve innervated muscles on manual muscle testing. All patients had nerve conduction tests and EMG to confirm the preliminary clinical diagnosis of CuTS.

2017;24(1):34-6
DOI:10.5455/jtomc.2016.11.117

Patients were evaluated according to gender, affected side and EMG results to assess the presence of neuropathy. Standard radiography of elbow was performed for all patients. Radiography was helpful in diagnosing severe elbow deformities, osteophytes, bone fragments or malalignment in patients with arthritis or a history of trauma. Exclusion criteria included patients had surgery for traumatic ulnar nerve injury, patients with systemic diseases which may affect the peripheral nerves, patients with cubitus valgus deformity and polyneuropathy. The study protocol received clearance from the Erciyes University research ethics board.

### *Statistical Analysis*

Mean and standard deviation were calculated for continuous variables if they were normally distributed and median with range were calculated if they are abnormally distributed or has outliers. The obtained data were statistically analyzed by Kormogonov-Smirnov and Shapiro-Wilk test.

## RESULTS

This is a retrospective clinical review of 128 patients treated with EMG with a preliminary clinical diagnosis of CuTS between the years of January 2009 and January 2016. 70 patients (54%) were male and 58 (46%) were female and the average age was 40.25±12.66. The affected side was right extremity in 70 (53%) of cases and left extremity in 62 (47%) who underwent EMG with a preliminary diagnosis of neuropathy. Symptoms were bilateral in 4 cases. As a result of EMG 43 (32.6%) (27 male, 16 female) patients had neuropathy. Affected side in 23 of these patients (53.5%) was left limb and 20 (46.5%) was right limb and 30 of involved patients were in the range 30-60 years.

## DISCUSSION

Diagnosis of CuTS requires a thorough history and physical examination. Where the patients generally notice numbness and tingling about the ring and small fingers that often associated with medial elbow or proximal forearm pain, patients may also initially present with non-specific complaints of hand clumsiness or weakness (6). In addition to nonspecific symptoms upper extremity can be confused with other neuropathies in differential diagnosis so that accurate diagnosis is very important in order to prevent wrong treatment. Confirmatory diagnostic tests are required because history and physical examination may not always be sufficient. EMG, ultrasonography and nerve conduction studies may be helpful in confirming the diagnosis of ulnar neuropathy (10, 11). EMG helps to determine the precise localization of the compressive lesion, quantifies the degree of the neurologic deficit and/or identifies alternate sites of nerve dysfunction simulating CuTS such as cervical radiculopathy, brachial plexopathy and/or ulnar nerve compression at the wrist at Guyon's canal (11). In this study, in 132 case with preliminary diagnosis of CuTS according to history and physical examination, only 43 (32.6%) cases were found to be CuTS when evaluated with EMG. Physical examination findings and EMG results are incompatible.

There is no disease-specific outcome measures have been validated for CuTS but numerous severity scales have been reported based on findings from history and physical examination (12). McGowan classified CuTS into three categories as mild, moderate and severe. Mild disease is defined as occasional paresthesias, positive Tinel's sign and subjective weakness. Moderate disease is defined as occasional paresthesias, positive Tinel's sign and objective weakness. Severe disease is defined as constant paresthesias and muscle wasting (13). For advanced disease objective findings of weakness in the muscles innervated by the ulnar nerve may be noted on examination. Patients may have weak finger abduction secondary to interosseus muscle atrophy, grip weakness, hand clumsiness or difficulty with precision pinch activities (11). It is easier to diagnose CuTS with history and physical examination for advanced disease than mild or moderate CuTS. All of our cases had CuTS-like symptoms.

For mild and moderate disease there are various provocative exam techniques may aid in diagnosis as placing the elbow in maximal flexion and full supination for one minute; Tinel's test, in which the cubital tunnel is tapped by the examiner's finger and compression of the nerve for one minute just proximal to the cubital tunnel with the elbow in 20° flexion and full supination. Their sensitivities are reported as 75%, 70% and 89% respectively (14,15). We believe that supportive therapies such as EMG should be performed in cases where we can confuse them with other upper extremity trap neuropathies without specific symptoms.

We know that our study has some limitations. The first, our study is single-centered we believe that it will be more appropriate to conduct the study more centrally and prospectively. Second, a prospective randomized controlled trial of EMG prompt distributions and concordance is required.

## CONCLUSION

Electrodiagnostic studies help physician to determine whether or not there is an ulnar nerve damage, to assess the severity of the damage and also to make the differential diagnosis. Because the treatment options are different according to the compression zone this distinction is critical for the treatment plan.

According to results of our study, we found that history and neurological examination have a low efficiency in the diagnosis of CuTS. This may be associated with relatively subjective evaluation of neurological examination and history and also many pathologies in the differential diagnosis of CuTS. In this respect, we believe that EMG application is required in addition to a detailed physical examination for CuTS in order to avoid delayed diagnosis and incomplete/incorrect treatment especially in mild and moderate CuTS.

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