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Original Research Article

Surgical profile and management of carpal tunnel syndrome among sample of Iraqi patients attending a teaching hospital

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ABSTRACT

Background: Carpal tunnel syndrome (CTS) is a common condition that causes pain, numbness, and weakness in the hands and wrist. CTS affecting female more than male, and diagnosed by EMG and NCS. The aim of this study was to describe the profile and surgical management among sample of Iraqi patients.
Methods: Sixty-two patients collected from the neuro-surgical departments of the specialized surgical hospital from June 2015 till June 2018, all patients studied thoroughly regarding age, sex, associated diseases, clinical features, EMG studies, surgery and out come and follow up for at least one year.
Results: There was around 2:1 female: male, with age predominant between 40-60 years. All the patients had pain (aching) and most of them numbness, and tingling and only 1/3 had atrophy of muscle of the hand all diagnosed by EMG and NCS, treated surgically results were good compared with other studies regarding complications and final outcome.
Conclusions: Surgery for CTS is safe and successful surgery under meticulus procedure and appropriate choice of patients.

Keywords: Carpal tunnel syndrome, Median and surgical decompression

INTRODUCTION

Carpal tunnel syndrome (CTS) is a medical condition due to compression of the median nerve as it travels through the wrist at the carpal tunnel.[1] CTS has been the most frequently prevalent entrapment neuropathy.[2-3] The latest data estimate the prevalence of CTS at 50 cases per 1,000 persons, with its incidence estimated at 1-3 per 1,000 persons. Open carpal tunnel release surgery has been the most frequently performed surgery on the hand over the past 2 decades. [4]

The following are the six diagnostic criteria for CTS: (1) nocturnal numbness, (2) numbness and tingling in the median nerve distribution, (3) weakness and/or atrophy of the thenar muscles, (4) Tinel's sign, (5) Phalen's sign, and (6) loss of two-point discrimination.[5]

For early CTS, non-surgical treatment, such as a splint or local steroid injection, is recommended. However, surgery is recommended in cases of rapidly progressing thenar muscle atrophy and hand dysfunction, persisting severe symptoms after conservative treatment for 2-7 weeks, persistent symptoms or signs of disability evidenced by electromyography, or aggravated two-point discrimination.[6]

CTS is more common in females, during middle age, and in winter.[7-13] This disease is also more common among employed individuals and is noted to be associated

significantly with certain professions.[14-16] There is high associated of CTS with pregnancy, lactation, Menopause, pyridoxine deficiency. Most cases of CTS are of unknown cause.[17] Carpal tunnel syndrome can be associated with any condition that causes pressure on the median nerve at the wrist. Some common conditions that can lead to CTS include obesity, hypothyroidism, arthritis, diabetes, prediabetes (impaired glucose tolerance), and trauma.[18] Genetics was also cited to play a role.[19]

Heredity: This is likely an important factor. The carpal tunnel may be smaller in some people or there may be anatomic differences that change the amount of space for the nerve—and these traits can run in families.

Repetitive hand use: Repeating the same hand and wrist motions or activities over a prolonged period of time may aggravate the tendons in the wrist, causing swelling that puts pressure on the nerve.

Hand and wrist position: Doing activities that involve extreme flexion or extension of the hand and wrist for a prolonged period of time can increase pressure on the nerve.

Pregnancy: Hormonal changes during pregnancy can cause swelling.

The carpal tunnel is a fibro-osseous tunnel in the palmer aspect of the wrist. It extends from the wrist flexion crease to the distal boarder of the thenar eminence. The contents of the tunnel are the median n. and the tendons of the flexor digitorum superficialis, flexor digitorum profunds and flexor polticis longus the tendon of the palmaris longus is continuous with the palmer aponeurosis.[20]

Diagnosis is suspected based on signs, symptoms and specific physical tests and may be confirmed with electro-diagnostic tests.[21]

Electrophysiological tests may include:

Nerve conduction studies: These tests measure the signals travelling in the nerves of the hand and arm and can detect when a nerve is not conducting its signal effectively.

Electromyogram (EMG): An EMG measures the electrical activity in muscles. EMG results can show whether you have any nerve or muscle damage.

Ultrasound: An ultrasound uses high-frequency sound waves to help create pictures of bone and tissue. Ultrasound of the wrist to evaluate the median nerve for signs of compression.

X-rays: X-rays provide images of dense structures, such as bone. If you have limited wrist motion or wrist pain, may order X-rays to exclude other causes for your symptoms, such as arthritis, ligament injury, or a fracture.

Magnetic resonance imaging (MRI) scans: These studies provide better images of the body's soft tissues. MRI help to determine other causes for symptoms or to look for abnormal tissues that could be impacting the median nerve. An MRI can also help to determine if there are problems with the nerve itself—such as scarring from an injury or tumor.

Surgical management: Despite the developments in medicine, most supportive therapies in modern medicine, such as splinting and corticosteroids, do not have long-term effects even if they are helpful.[12,22] Although surgical therapies have better long-term effects in reducing symptoms, conservative treatment only used in mild short symptoms, but the usual management is surgery skin incision used in the section of the transverse carpal ligament. An incision directly in the volar crease should be avoided, and the palmar cutaneous branch of the median n. should be preserved. Placement of the incision on the ulnar side of the volar crease tends to avoid the motor branch of the median n.[23,24]

METHODS

Sixty-two patients collected from surgical and orthopedic department in Al-Karama Teaching Hospital, from June 2015 till June 2018. Information obtained from all patients thoroughly including age, gender, clinical features, associated diseases diagnosis, surgical Management, complications, outcome after at least 1 year follow up. Patients included if the meet inclusion criteria which are aged 18 and above, consented to participate in the study, and has not been operated before for same condition. Exclusion criteria included, patients who are suffering from other malignant diseases or having serious heart disease that affect outcome of surgery. Treated patients whether underwent surgery alone or combined with conservative were followed up to one year to measure the outcome of the management. All data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 22.

RESULTS

Age and gender distribution are shown below**.** Around 83% of the patients are between age of 40-60. Majority of patients were females (67.74%) (Table 1).

The clinical presentation, all the patients had pain (aching) in nature in the hand and 82% had the typical diurnal variation that the pain is more at night, numbness typically in the lateral side of the hand 87% tingling 85.5%, 35.5% had clinical atrophy of the thenar muscles, tinels sign in 54.8%, Phalen test positive in 58%. The right hand affected slightly more than the left which is explained by the Rt. handed using the right hand more and more liability of trauma (Table 2).

Table 1: Age and gender distribution of the sample.

Variable	No.	%
Age (in years)		
<30	3	4.83
31-40	6	9.70
41-50	35	56.45
51-60	16	25.80
<60	2	3.22
Gender		
Male	20	32.26
Female	42	67.74

Table 2: Clinical profile of the sample.

Variable	No.	%
Affected arm		
RT side	28	45.4
Lt. side	23	37.1
Bilatiral	9	14.5
Symptoms and signs		
Aching in the hand (pain)	62	100
Aching in the hand (pain) more at night	51	82.25
Numbness	54	87.1
Tingling	53	85.5
Tinel's sign	34	54.8
Phalen test positive	36	58.1
Atrophy of the thenar area	22	35.5
Associated diseases		
Pregnancy	10	16.13
Diabetes	9	14.52
Rheumatoid arthritis	4	6.45
Acromegaly	4	6.45
None	35	56.45

Table 3: Management profile and outcome.

Variable	No.	%
Management		
Conservative + surgical	32	51.6
Surgical	30	48.4
Complications		
Wound infection	3	27.2
Ugly scar	4	36.4
Pain	2	18.2
Recurrence	2	18.2
Prognosis		
Good	56	90.3
Fair	4	6.5
Poor	2	3.2

It was found that around half of the sample had surgery only and the rest had conservative and surgical management. In regards to complications, ugly scar was the most frequent complication followed by wound infection while pain and recurrence was reported among 18% of patients who had complications. The prognosis was good among 90% of the sample and only 3.25 had poor prognosis (Table 3).

DISCUSSION

There is an obvious female predominance which goes with most studies in the field, and around 85% of the patients are between age of 40-60 which also goes with most studies.[22,25,26] The right hand affected slightly more than the left which is explained by the Rt. handed using the right hand more and more liability of trauma.

The clinical presentation, all the patients had pain (aching) in nature in the hand and 82% had the typical diurnal variation that the pain is more at night, numbness typically in the lateral side of the hand 88% tingling 86%, 34% had clinical atrophy of the thenar muscles, tinels sign in 55%, phalen test positive in 58%, and this also goes with most studies in the field. [27]

More than half of the cases were idiopathic which also goes with most studies in the field.[27] All the patients the final diagnosis was made by EMG and NCS although some times we needed MRI or CT or X-ray of cervical spine to exclude other pathologic for the symptoms of the patients.

Regarding the management about half of the patients were given a chance for conservative treatments by analgesics and muscle relaxant and physiotherapy and the other half with severe or acute symptoms treated by surgery immediately with no chance for conservative treatment, those who refuse surgery were excluded from the study.

The complications of surgery were wound infection in 4.8% and ugly scar 6.4%, pain (residual) 3.2%, 3.2% require another surgery for recurrence, and there was not a single injury to the median n. or it's palmer branch.

These results are good compared with other studies as canon and love from mayoclinic, with very close resultsand the well known study of Phalen and Scoggin et al.[28-30]

The final outcome 92%, show good results whether by one or two surgeries 6.4% with mild residual pain and only 1.6% did not have relief of their symptoms, these are good results compared wild cannon and love and Phalen's study, and Scoggi et al.[28-30]

CONCLUSION

Surgical treatment and early postoperative rehabilitation reduce subjective symptom severity, improve functional status of the hand and decrease superficial sensory disturbances on the pulps of fingers I-III and decrease median nerve responses to challenge tests. The best clinical condition after treatment (symptom severity,

functional status) was found in the patients with mild CTS.

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