

MANAGEMENT OF CARPAL TUNNEL SYNDROME: AN EXPERIENCE IN DHQ TEACHING HOSPITAL D.I. KHAN, PAKISTAN

Shahid Nawaz¹, Muhammad Usman[✉], Muhammad Zubair²

ABSTRACT

BACKGROUND: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, which is clear from the fact that approximately 250,000 to 300,000 carpal tunnel releases are performed annually in the United States. The incidence of CTS is estimated to be approximately 1% for the general population and about 5% or more for workers, who worked in industries that demand repetitive use of the hands and wrists. Objective of this study was to collect data on clinical characteristics and outcomes of carpal tunnel syndrome.

Methods: This prospective observational study was conducted in Neurosurgery department of DHQ Hospital, Gomal Medical College D. I. Khan, from April 2015 to March 2016. All the diagnosed patients of either age and sex were included in the study, while patients with associated cervical pathology were excluded from the study. Initially patients were treated conservatively. Patients failing to conservative treatment were offered surgery. The follow up was done at 1 month and 2 months post-operatively. A database was compiled using medical records. Data collection included variables, such as age, sex, side of involvement, disease severity and improvement in symptoms at follow-up visits.

Results: Majority of the patients, 45 (78.9%), were female. The age ranges from 20-95 years, with mean age of 39.79 ± 11.25 years. Right hand was involved in most of the patients, 33 (57.9%). The disease was mild in 11 (19.3%), moderate in 29 (50.9) and severe in 17 (29.8%) patients. After 1 month of conservative treatment, 24 (42.1%) patients were improved, while remaining patients underwent surgical decompression, carpal tunnel release. At final follow-up, out of 33 patients, 29 (90.6%) were improved, while in 3 patients there was re-occurrence of CTS and in those re-surgery was done.

Conclusion: Carpal tunnel syndrome is common in females, age group of 36-50 years with dominance of right hand involvement. Conservative treatment has a role in mild to moderate disease, but surgery plays a vital role in severe cases and patients refractory to conservative treatment.

Keywords: Carpal Tunnel Syndrome, Outcome, Carpal Tunnel Release.

✉ Senior Registrar – Deptt of Neurosurgery, Gajju Khan Medical College, Bacha Khan Medical Complex, Swabi, Pakistan.

@ drusman387@yahoo.com

☎ 0333-91506081

1. Deptt of Neurosurgery, Gajju Khan Medical College, Bacha Khan Medical Complex, Swabi, Pakistan.

2. Deptt of Neurosurgery, DHQ Teaching Hospital, Gomal Medical College, D. I. Khan, Pakistan.

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INTRODUCTION

Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, which is clear from the fact that approximately 250,000 to 300,000 carpal tunnel releases are performed annually in the United States¹. The incidence of CTS is estimated to be approximately 1% for the general population and about 5% or more for workers, who worked in industries that demand repetitive use of the hands and wrists². In USA, the incidence of CTS is estimated to be 1 to 3 per 1000 per year, with prevalence of 50 per 1000. The similar incidence and prevalence has been reported in most of the developed countries. The disease mostly affects whites, with up to a 10:1 predominance of females and has got peak age of 46 to 60 years³.

Carpal tunnel syndrome is due to the increased carpal tunnel pressure and resultant compression of the median nerve. The common causes of CTS are genetic predisposition, frequent use of wrist (like; typing, machine work), obesity, autoimmune disorders such as rheumatoid arthritis, and pregnancy. The initial presenting symptoms of CTS include pain, numbness, and paresthesias, which most of the times present, with some variability, in the thumb, index, middle and the radial half of the ring finger (it is the typical sensory distribution of the median nerve). In some of the patients, the pain also radiates up the arm. With involvement of the motor component and further progression, there may be hand weakness, decreased fine motor coordination and thenar atrophy⁴.

The treatment of the CTS is conservative to patients of mild to moderate disease^{5,7}, that may subsequently reduce the number of patients undergoing surgical intervention^{5,6,8}. Surgical treatment, carpal tunnel release, is indicated in refractory cases who do not respond to conservative treatment⁹, or for advanced and chronic cases⁷. There are various surgical techniques reported in the literature. One of those is the open neurolysis of the median nerve, which was performed for the first time in 1924 by Mackinnon, and in 1950 Phalen et al

popularized this procedure¹⁰. Essentially, open neurolysis of the median nerve for the CTS is the most common procedure¹¹.

To my knowledge there is scarcity of local data in this aspect in our area. So, we conducted this study in our department to know the disease demographics and the outcome in our area and setup respectively. The data will help, not only the local health care providers to properly treat the disease by knowing the outcome, but it will also make a future direction for further studies on CTS.

MATERIAL & METHODS

This prospective observational study was conducted in Neurosurgery department of DHQ Hospital, Gomal Medical College D. I. Khan, from April 2015 to March 2016. All the patients were diagnosed on the basis of detailed history, examination and Investigations; like Nerve conduction study and Electromyographic study of upper limbs. All the diagnosed patients of either age and sex were included in the study, while patients with associated cervical pathology, diagnosed on the basis of symptoms and signs of cervical radiculopathy and / or myelopathy, were excluded from the study. Patients were recruited through consecutive non-probability sampling technique.

Initially patients were treated conservatively for a period of 1 month. The conservative treatment includes, analgesics, muscle relaxant, proton pump inhibitor, methycobolamin, pregabalin (in some cases) and rest from manual activity of the hand. After one month of conservative management, those patients who did not improve, were offered surgery after explaining pros and cons. They underwent surgical decompression, Carpal Tunnel Release under local anesthesia. The follow up was done then at 1 month and 2 months post-operatively. Consent was taken from all those patients willing for surgery. All the patients were assessed on the subjective improvement in the symptomatology, at follow – up visits.

A database was compiled using medical records. Data collection

included variables, such as age, sex, side of involvement, disease severity and improvement in symptoms at follow-up visits. Data was analyzed by descriptive statistics, in terms of frequencies, percentages and mean ± standard deviation using Statistical Package for Social Sciences (SPSS) software version 17. The p-value was calculated by chi-square test and statistical significance was defined as $p < 0.05$.

RESULTS

Out of total 57 patients, 45 (78.9%) were female, while 12 (21.1%) were male, with male to female ratio of 1:3.75. The age ranges from 20-95 years, with mean age of 39.79 ± 11.25 years. Majority of the patients, 34 (59.6%), were in the age range of 36-50 years (Figure 1). Right hand was involved in most of the patients, 33

(57.9%) (Table I). The disease was mild in 11 (19.3%), moderate in 29 (50.9) and severe in 17 (29.8%) patients, evident on Nerve Conduction Study and Electromyography. All the patients were given conservative treatment initially.

After 1 month 24 (42.1%) patients were improved. Remaining patients, 33 (57.9%) underwent surgical decompression of the median nerve, carpal tunnel release under local anesthesia. One month after surgery, all the patients were improved. But at final follow-up, 2 months after surgery, out of 33 patients, 29 (90.6%) were improved, while in 3 patients there was re-occurrence of CTS and in those re-surgery was done. One patient lost to follow – up at final visit.

The CTS is more severe in females and right hand, as p value is statistically significant (Table II).

TABLE 1: HAND INVOLVEMENT

Hand	Frequency	Percent	Valid Percent	Cumulative Percent
Right	33	57.9	57.9	57.9
Left	14	24.6	24.6	82.5
Both (Right > Left)	7	12.3	12.3	94.7
Both (Left > Right)	3	5.3	5.3	100.0
Total	57	100.0	100.0	

TABLE 1: SEVERITY OF CTS

Variable			P value
Severity of CTS	Male (8.33%)	Female (35.55%)	0.012
Hand Involvement	Right (57.89%)	Left (24.56%)	0.012

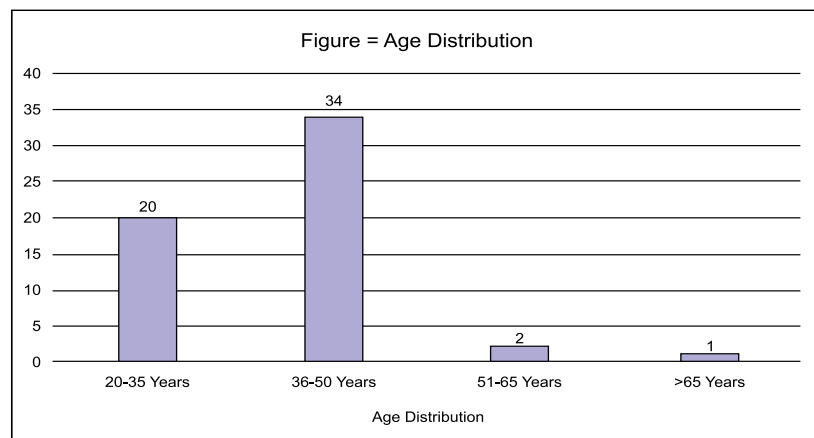


Fig 1:

DISCUSSION

In our study majority of the patients, 45 (78.9%) were female, with male to female ratio of 1:3.75. The age ranges from 20-95 years, with mean age of 39.79 ± 11.25 years. More than half of the patients, 34 (59.6%), were in the age range of 36-50 years. Right hand was pre-dominantly involved, 33 (57.9%). The disease severity was mild in 11 (19.3%), moderate in 29 (50.9) and severe in 17 (29.8%) patients. All the patients were given conservative treatment initially, 24 (42.1%) patients responded to conservative treatment, while remaining patients, 33 (57.9%) underwent surgical decompression. One month after surgery, all the patients were improved. But at final follow-up, 2 months after surgery, out of 33 patients, 29 (90.6%) were improved, while in 3 patients there was re-occurrence of CTS and in those re-surgery was done.

In the current study females (78.9%) harbor the CTS more than the males with a ratio of 1:3.75 and the mean age in our study was 39.79 ± 11.25 years. This data is compatible with Flores et al¹², Eroglu et al¹³, Nazzi et al¹⁴ and with other researchers^{4,15,16}.

Current study showed that the CTS is more severe in females and right hand. Majority of the patients in our study has right hand as a dominant hand and this is a fact that dominant hand is more often affected by CTS, although it is evident from the literature that the CTS involve both hands occasionally, particularly if there are narrow canals¹⁷. The carpal tunnel is narrower in some people than in others¹⁷. In women the carpal tunnel is narrower than men and this is the reason for CTS to be more common in women⁴. In our study bilateral hands were involved in 10 patients (17.54%), while in a study¹⁶ bilateral hands were involved in 15 patients (27.27%). This difference is due to the fact that in that study the female population (84.61%) is more as compare to our study (78.9%).

CTS possess signs and symptoms analogous to those seen with other disorders, such as cervical pathology or ischemic or neoplastic

intracranial disease⁴. We excluded all those patients of CTS, who had concomitant signs and symptoms of cervical disease (radiculopathy and/or myelopathy). These diseases act as confounders and if included would produce bias in the study results.

The conservative treatment of CTS consists of multiple treatment options, ranging from vitamins B6 and B12, analgesics; nonsteroidal anti-inflammatory medicines, steroids; oral and local injections, splinting and physiotherapy. The contemporary literature suggests that splinting and oral or local injection of steroid may be considerably effective for relieving the symptoms of CTS, though they often provide only short-term relief from the symptoms¹⁸.

In the current study all the patients received conservative treatment initially, 24 (42.1%) improved while remaining (n=33, 57.9%) received surgical treatment. Furthermore, in the current study, disease was mild in 11 (19.3%), moderate in 29 (50.9) and severe in 17 (29.8%) patients. The data is comparable with an International Study¹⁹, in which 38.6% of patients received medical treatment and 61.4% surgical treatment. The other variable, i.e., disease severity is also compatible with the same study, as in that study, more than half of the patients was having moderate disease with a frequency of 56.1% on the right side and 50.6% on the left side¹⁹.

In our study, at final follow-up, 2 months after surgery, out of 33 patients, 29 (90.6%) were improved, while in 3 patients there was re-occurrence of CTS and in those re-surgery was done. In a study²⁰, there were 100% improvement in the first 3 months after release, the results are superior than in most of the large studies. Nevertheless, the surgery for the CTS is a valuable procedure and if the diagnosis is correct, a high rate of improvement can be achieved. The 100% results found in that study might be due to small sample size. In published larger patient series, patients with persistent symptoms are likely²⁰

CONCLUSION

Carpal tunnel syndrome is common in females, age group of 36-50 years with dominance of right hand involvement. Half of the patients harbor moderate disease. Conservative treatment has a role in mild to moderate disease, but surgery plays a vital role in severe cases and patients refractory to conservative treatment.

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CONFLICT OF INTEREST

None declared.

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NIL

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.