

## Presentation and Surgical Outcome of Carpal Tunnel Syndrome

FAROOQ AZAM,<sup>1</sup> RIAZ UR REHMAN,<sup>2</sup> AZMATULLAH<sup>3</sup>

Mushtaq,<sup>4</sup> Ifthihar khan,<sup>5</sup> Waqar Alam<sup>6</sup>

<sup>1,2,3,4</sup>Department of Neurosurgery, <sup>5</sup>IKD, Hayatabad Medical Complex

<sup>6</sup>TMO Orthopedic KTH, Peshawar

### ABSTRACT

**Objective:** The authors present their experience in evaluation of Clinical features and the surgical outcome of carpal tunnel syndrome.

**Material and Methods:** This descriptive study was conducted in Neurosurgery Department Hayatabad Medical Complex (HMC), Peshawar from 31march 2008 to 30 march 2010. Thirty one patients from both sexes were included. There was no gender discrimination in patient selection. However age limit was from twenty to sixty years. Cases with multiple nerve compression abnormalities, cervical radiculopathy, ulnar nerve compression, diabetic polyneuropathy or those who had Long-term exposure to vibrating tools were excluded. Diagnosis were made on positive clinical history, clinical examinations and Confirmed by nerve conduction studies. Open carpal tunnel release was done and then followed for 3 months for relief of symptoms and complications.

**Results:** Thirty one patients were included. The youngest patient was 22 years while the oldest one was 56 years with mean age 34 years  $\pm$  29.3. Female to male ratio was 6:1. Commonest presentation was pain and paresthesia in the affected hand. Open surgical release was performed for all patients. One patient (3%) developed superficial surgical site infection. The results of surgical treatment were excellent with 90% patients being completely relieved of symptoms after three months follow up.

**Conclusion:** Carpal tunnel syndrome is common in female and manual workers. Pain is the predominant symptoms. Some patients may present with complications. Open carpal tunnel release is still preferable because of minimum complications and quick recovery.

**Key Words:** Presentation. Surgical outcome. Carpal tunnel syndrome.

**Abbreviations:** CTS: Carpal tunnel syndrome.

### INTRODUCTION

Carpal tunnel syndrome (CTS) is the most common peripheral neuropathy.<sup>1</sup> It is caused by entrapment of median nerve in an inflamed and swollen transverse carpal ligament from above as it goes through the carpal tunnel, along with the tendons of the hand and fingers.<sup>2</sup>

Etiological factors include repetitive wrist movements, vibration, and forceful physical demands on the wrist that are required in such jobs as construction and manufacturing lead to the development of CTS.<sup>3</sup> Other contributory factors include infections such as Lyme disease; inflammatory conditions such as gout and

rheumatoid arthritis; diabetes; obesity; and pregnancy.<sup>1,4</sup>

Symptoms are usually caused by high pressure on the median nerve in the carpal tunnel rather than to damage to the nerve.<sup>1</sup> CTS is more prevalent in females than in male.<sup>5</sup> Patients with CTS typically report symptoms of numbness, tingling, and nocturnal burning pain. Clinical signs may include a decrease in both discriminative and light touch sensation, and in advanced cases, a loss of grip and pinch strength.<sup>1</sup> Diagnosis is confirmed by physical examination (i.e Phalen's maneuver and Tinel's test) and Electromyographic studies.<sup>5</sup>

Treatment options include non pharmacological, pharmacological and surgical. Non pharmacologic treatment of CTS includes splinting of the wrist at a neutral angle within 3 months of the onset of symptoms and Ultrasound therapy.<sup>4</sup>

Conventional treatments comprise splinting, diuretics and corticosteroid injections, and carpal tunnel decompression (CTD) if conservative measures fail.<sup>7</sup>

Mild cases can be managed conservatively. However surgery is the only curative option in moderate to severe cases.<sup>8</sup> Once thenar muscle wasting sets in, it is difficult to regain muscle bulk after surgery.<sup>9</sup>

The purpose of this study is to share our experience with the presentation and the surgical outcome of carpal tunnel syndrome. Carpal tunnel syndrome is a curable condition but if either diagnosis or treatment is delayed, the patient may develop complications like thenar muscle wasting. Once the complications are developed, these will not reverse even with treatment.

**CLINICAL MATERIAL AND METHODS**

This descriptive study was conducted in Neurosurgery Department Hayatabad Medical Complex (HMC), Peshawar from 31 march 2008 to 30 march 2010. Study Population included those Patients who attended neurosurgery OPD having clinical features of CTS.

Permission for this study was taken from the ethical committee Hayatabad Medical Complex, Peshawar. Written informed consent was taken from all patients.

**Inclusion Criteria**

There was no gender discrimination in patient selection. However age limit was from twenty to sixty years.

**Exclusion Criteria**

Cases with multiple nerve compression abnormalities, cervical radiculopathy, ulnar nerve compression, diabetic polyneuropathy or those who had Long – term exposure to vibrating tools were excluded.

Carpal tunnel syndrome was diagnosed on detail history, clinical examinations and Confirmed by nerve conduction studies.

**Operation Technique**

Open surgical release was performed under local anesthesia with tourniquet control. Curved incision made

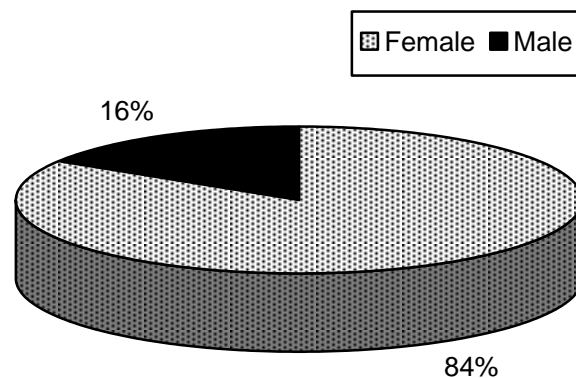
parallel and ulnar to the thenar crease without crossing the flexor crease at right angle. The retinaculotome was then introduced into the wound with the foot plate of the instrument beneath the carpal ligament. The ligament then cut with the elevated knife blade as the retinaculotome would advance into the palm in a slightly ulnar direction. Only skin was closed and dressing removed after 48 hours and early movement was encouraged.

Patients were followed at 1 week, 1 month and 3 months post surgery for complications and relief of symptoms. All above information regarding preoperative clinical features, post operative complications and relief of symptoms were put in a semi structured Performa and stored in our computer database. Outcome was measured in terms of improvement in symptoms and complications of surgery. Only patients with completed files at 3 months were entered into this study. The data was then put in SPSS 16 and analyzed. Mean ± SD was calculated for age. Age distribution, clinical features and surgical outcome were presented as tables and graph.

**RESULTS**

**Sex Incidence**

Thirty one patients met the inclusion criteria. Female population was predominant i.e sex incidence 26 (84%) patients were female 5 (16%) were male as shown in pie chart 1. Female to Male ratio was 5 : 1.



**Fig. 1:**

**Age Incidence**

The youngest patient was 22 years while the oldest one was 56 years. Age distribution is shown in table 1.

**Clinical Features**

All patients had pain and paresthesia on presentation in the distribution of median nerve. Some people would complain of pain in whole hand but on close inquiry little finger would rarely be involved. The rest of clinical features are shown in graph below. CTS were bilateral in twelve cases (39%). Tinet’s Sign was present in 25 (81%) patients and Phalen test was positive in 27 (87%).

**Table 1: Age Distribution.**

S. No.	Age Group	No of Patients	Percentage
1.	20 – 30	7	23
2.	31 – 40	9	29
3.	41 – 50	11	35
4.	51 – 60	4	13

**Investigations**

Twenty nine patients (94%) had positive nerve conduction study.

**Outcome**

Open surgical release was performed for all patients. At the end of three months follow up, twenty nine

patients (94%) were completely pain free (Table 2). Only one patient (3%) developed superficial surgical site infection.

**Complications**

One (3%) patient had surgical site wound infection, one (3%) patient developed hypertrophic scar and pain. One 3% patients suffered recurrence of carpal tunnel syndrome after a period of 3 weeks.

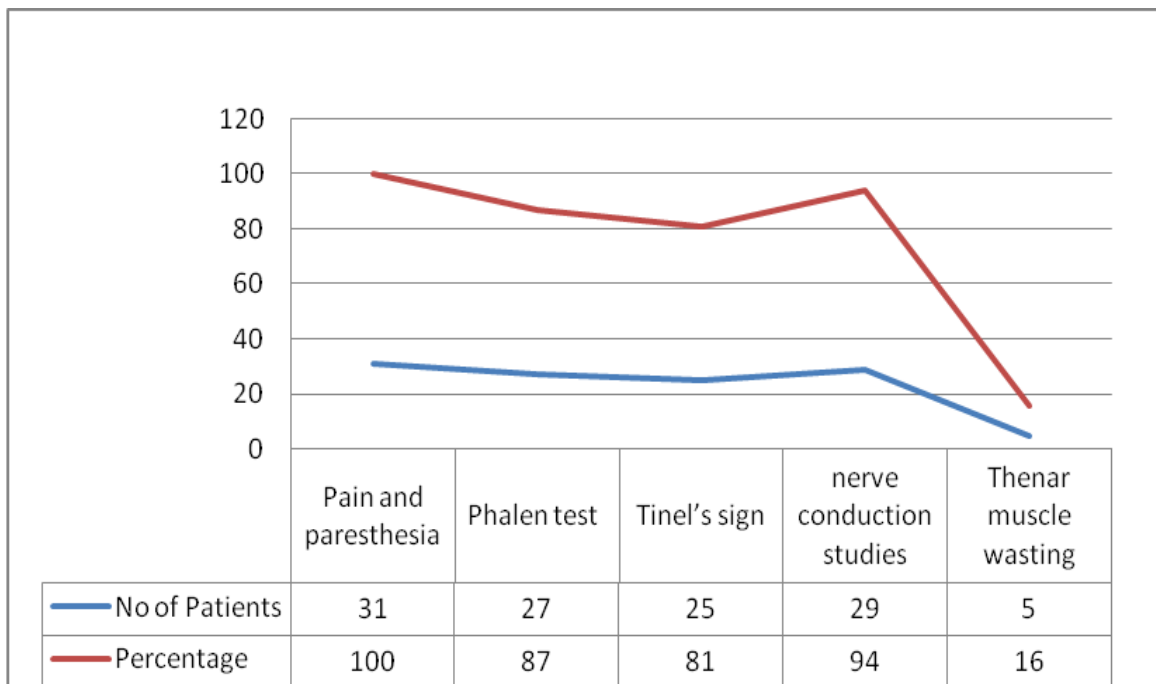
**Table 2: Surgical Outcome.**

S. No.	Outcome	No. of Patients	Percentage
1.	Pain relief	29	94%
2.	Surgical site wound infection	1	3%
3.	Hypertrophic scar	1	3%
4.	Recurrent CTS	1	3%

**DISCUSSION**

Carpal tunnel syndrome is work related musculoskeletal disorder which occurs due to compression of the median nerve within the carpal tunnel.<sup>10</sup> The classic symptoms of CTS include nocturnal pain associated

**Fig. 2: Clinical Features.**



with tingling and numbness in the distribution of median nerve in the hand.<sup>11</sup> Surgery can be done by open or by endoscopic method. But the results of open method particularly through small incision comparable with than endoscopic method.<sup>8,12</sup>

The youngest patient was twenty two while the oldest one was fifty six years old in the present study. The age range is almost the same in various studies.<sup>8,9,12</sup>

Most of the patients in this analysis were female, with a female to male ratio of 5 : 1, which is same as reported by other workers<sup>9</sup> while Alamgir et al and Shaber M showed 9 : 1 and 7 : 1 female to male ratio respectively.<sup>8,12</sup> This is probably because of the fact that most of the female in our society are involved in extensive manual work. The 5 males were also manual labourers. Phalen test, Tinel's sign and nerve conduction studies were positive in 87%, 81% and 94% cases respectively, which was similar to studies of Alamgir et al and Shabeer M.<sup>9,12</sup>

The average operation time was 15 minutes. Sudqi A et al would take 12 minutes to complete the procedure but he would make mini open wrist crease incision.<sup>14</sup> Thickening of the transverse carpal ligament and narrowing of the canal was noticed in all patients intra operatively. These intra-operative findings were observed by Karaeminoguller et al other researchers too.<sup>12,13</sup>

In follow up period 94% patients had complete relief of pain, 2 patients had persistent pain, one in scar while the other patient had recurrent CTS. One patient had superficial surgical site wound infection. He was treated with antibiotics and daily regular dressings.

Overall results of the current study are comparable with studies of Alamgir et al, Shabeer M and Karaeminoguller et al and several others.<sup>8,12,13</sup>

## CONCLUSION

Carpal tunnel syndrome is common in female and manual workers. Pain is the predominant symptoms. Some patients may present with complications. Open carpal tunnel release is still preferable because of minimum complications and quick recovery.

Open surgical release of carpal tunnel is simple, safe and cost effective.

## Disclaimer

The authors report no conflict of interest concerning the materials or methods used in this study or the find-

ings specified in this paper.

*Address for Correspondence:*

*Dr. Riaz-ur-Rehman*

*Al-Noor Drug Agency, Small Industrial Estate  
Kohat Road, Peshawar*

*Email: drriazurrehman@yahoo.com*

*Cell No: +92-91-3339250932*

## REFERENCES

1. Moscony AMB. Common peripheral nerve problems. In: Cooper C, ed. Fundamentals of Hand Therapy: Clinical Reasoning and Treatment Guidelines for Common Diagnoses of the Upper Extremity. Philadelphia: Mosby Elsevier; 2007: 201-250.
2. Prakash, K.M., Fook – Chong, S., Leoh, T.H., et al. Sensitivities of sensory nerve conduction study parameters in carpal tunnel syndrome. J. Clin. Neurophysiol. 2006; 23: 565–567.
3. Armstrong T, Dale AM, Franzblau A, Evanoff BA. Risk factors for carpal tunnel syndrome and median neuropathy in a working population. J Occup Environ Med. 2008; 50: 1355-1364.
4. Viera AJ. Management of carpal tunnel syndrome. Am Fam Physician. 2003; 68: 265-272.
5. Bland JD. Carpal tunnel syndrome. Curr Opin Neurol. Oct. 2005; 18 (5): 581-5.
6. Flak, M., Durmala, J., Czernicki, K., et al. Double crush syndrome evaluation in the median nerve in clinical, radiological and electrophysiological examination. Stud. Health Technol. Inform., 2006; 123: 435–441.
7. Ashworth N: Carpal tunnel syndrome. Am Fam Physician 2007; 75: 381-383.
8. Alamgir, Ali M, Zahid. The surgical treatment of carpal tunnel syndrome.pak J of neurol surg 2008; 12 (2): 40-42.
9. Ahmed GS. Chronic Carpal Tunnel Syndrome: Results of Carpal Tunnel Release. J Liaquat Uni Med Health Sci. 2007; 6 (1): 21-4.
10. Palmer KT, Harris EC, Coggon D. Carpal tunnel syndrome and its relation to occupation: a systematic literature review. Occup Med (Lond). 2007; 57 (1): 57–66.
11. Aroori S, Spence R AJ. Carpal tunnel syndrome: Ulster Med J.2008; 77 (1): 6–17.
12. Shabbir M. Surgical treatment of Carpal Tunnel Syndrome. J Postgrad Med Inst. 2004; 18 (1): 29-32.
13. Karaeminogullari O; Ozturk A; Tuzuner T. "Endoscopic carpal ligament release using the Chow technique, early clinical results". Acta. Ortho. Traumatol. Turc, 2003; 37 (3): 226-32.
14. Sudqi A. Hamed1, Falah Z, Harfoushi. Carpal tunnel release via mini – open wrist crease incision: procedure and results of four years clinical experience. Pak J Med Sci. 2006; 22 (4): 367-372.