ORIGINAL ARTICLE

Assessment of Nocturnal Pain Control Outcomes Following Open Surgical Release of Carpal Tunnel Syndrome

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ABSTRACT

Objective: *To assess the Nocturnal Pain Control Outcomes of Open Surgical Release of Carpal Tunnel Syndrome.*

Study Design: *Descriptive case series.*

Place and Duration of Study: *medical Teaching Institution, Govt. Lady Reading Hospital Peshawar from 3/5/2016 to 3/11/2016 (six months).*

Materials and Methods: *Patients of tunnel syndrome (CTS) of both gender and age ranging from 20 to 60 years were included. Patients with recurrent carpal tunnel syndrome and those having previous wrist surgery done for other diseases were excluded. Diagnosis was done on history, clinical examination and electrophysiological studies. Open surgical release was done in all cases. Patients were followed after 10 days and were assessed clinically on visual analogue scale. Statistical tests with significance of $P < 0.05$ were utilized using statistical package of social sciences (SPSS version 17).*

Results: *Mean age of the study participants was 39.90 ± 3.99. Twenty one percent (21%) patients were male and seventy nine (79%) patients were female. Fifty – eight percent (58%) of the patient had CTS in right hand while forty – two percent (42%) had in the left hand. Eighty two percent (82%) patients had controlled pain while eighteen percent (18%) patients had uncontrolled pain.*

Conclusion: *Our study concludes that eighty two percent (82%) patients had complete relief of nocturnal pain in patients presenting with carpal tunnel syndrome after open surgical release.*

Key words *Carpal tunnel syndrome, Thenar, Entrapment neuropaghy.*

INTRODUCTION

A type of neuropathy (entrapment) caused by compression of median nerve at the level of wrist in carpal tunnel. Prevalence of symptomatic carpal tunnel syndrome (CTS) which is electro physiologically confirmed is approximately 5.8% among women and 0.6% among men.[13] There are many risk factors of carpal tunnel syndrome which include obesity, rheumatoid arthritis, diabetes mellitus, lupus erythematosis, hypothyroidism. Pregnant females, those females which are taking birth control pills or taking estrogen. Repetitive wrist movements, smoking, fractured and dislocated wrist bones, mal healed bones and bony spurs.[2] Clinical presentation is in the form of sensory and motor impairments. Sensory impairment includes numbness and paresthesias while the motor deficit includes weakness of abductorpollicisbrevis, opponenspollicis, and the superficial belly of the flexor pollicis brevis.[1] Prolonged and severe compression of the median nerve causes atrophy of the thenar muscles.

Carpal tunnel syndrome is diagnosed by history and physical examination. In clinical examination two provocative tests/signs are important. They are Phalen's test and Tinel's sign. In Phalen's test Patient is asked to fully flex the wrist for sixty seconds. If the patient feels pain and paresthesias in the distribution of

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median nerve, the test is s positive. Phalen's test is having sensitivity of 92% while its specificity is 88%.[8] Tapping the volar surface of the wrist is Tinel's sign. If the patient feels pain and paresthesias in the distribution of median nerve, the test is considered positive. The sensitivity of Tinel's sign is 97% while its specificity is 91%.[8] To confirm the clinical diagnosis of carpal tunnel syndrome Electrodiagnostic testing is used.[6] Ultrasound and MRI wrist can also be used in complicated cases to make and support the diagnosis of carpal tunnel syndrome.[7]

Management of carpal tunnel syndrome is both conservative and surgical methods. Conservative treatment may include physical therapy, bracing, steroid injections and is specifically reserved for those patients having mild symptoms.[5] Surgical therapy is reserved for those patients who fail to respond to conservative management or having neurological deficit in the form of wasting of hand muscles (thenar). Open and endoscopic are the two main surgical approaches used. But the data is limited to show the superiority of one approach over the other.[4] In literature the pain relief after carpal tunnel release for carpal tunnel syndrome has been mentioned 95% and no pain relief in 5%.[5]

To show the effectiveness of open surgical release of carpal tunnel syndrome in our setup. This will provide us the research data in our setup which will open the gateway for future researchers on this topic. It will provide us the international studies which will show us the pros and cones of our technique and will be a step for the patient betterment and care.

MATERIALS AND METHODS

It was a retrospective case done in Neurosurgery Department Lady Reading Hospital (LRH) Peshawar Khyber Pakhtunkhwa (K.P.K), Pakistan. After taking approval from ethical committee Lady Reading Hospital and taking informed consent, all patients presenting in outpatient department (OPD) with both gender and age ranging from 20 to 60 years were included. Patients having post operative recurrent carpal tunnel syndrome and those having previous wrist surgeries for any other disease were excluded. Non-probability consecutive sampling technique was used for sample collection. Data collected from 3/5/2016 to 3/11/2016 (six months). The total sample size was 46 with 95% confidence interval and 5% margin of error and prevalence 3%.

All patients were admitted from OPD, and were treated as a day care case. Patients having moderate to severe signs and symptoms (especially nocturnal pain) not effectively controlled by medication and other alternative non-surgical treatment were advised NCS (nerve conduction studies) and EMG (Electromyography). Patients having sensory latency of >4 ms on NCS of median nerve were offered open surgical release.

All patients were operated on elective list by a single neurosurgeon. All cases were done under local anesthesia. Transpalmar approach through a longitudinal incision was used. Only skin approximation was done by using 3/0 prolene, taking vertical mattress sutures. Patients were advised pain killers (ibuprofen) for one week and were followed after ten days. Stitches were removed and patients were assessed clinically on visual analogue scale for nocturnal pain. Patients having score "0" on visual analogue scale were categorized as pain controlled and those having score from 1 to 10 were categorized as pain not controlled.

Statistical Analysis

The data was analyzed the statistical program SPSS version 17. Descriptive statistics like mean ± standard deviation was used for age. Frequency/percentage was calculated for categorical variables like gender and pain. Outcome was stratified among the age, gender, and right/left hand to see the effect modification. Inclusion and exclusion criteria were strictly followed with controlled confounders and bias. Results were presented in tables for different variables.

RESULTS

This study was conducted at Department of Neurosurgery, Lady Reading Hospital, Peshawar in which a total of 46 patients were observed to assess the nocturnal pain control outcome of open surgical release of carpal tunnel syndrome and the results were analyzed

Table 1: *Age Distribution (n = 46).*

Age	Frequency	Percentage
20 – 30 years	10	21%
31 – 40 years	16	35%
41 – 50 years	15	32%
51 – 60 years	5	12%
Total	46	100%

as: Age distribution among 46 patients was analyzed as 10 (21%) patients were in age range 20 – 30 years, 16 (35%) patients were in age range 31 – 40 years, 15 (32%) patients were in age range 41 – 50 years, and 5 (12%) patients were in age range 51 – 60. Mean age was 39.29 ± 3.99 years.

Gender distribution among 46 patients was analyzed as 10 (21%) patients were male and 36 (79%) patients were female.

Table 2: *Gender Distribution (n = 46).*

Gender	Frequency	Percentage
Male	10	21%
Female	36	79%
Total	46	100%

Laterality of carpal tunnel syndrome in hands among 46 patients was analyzed as 27 (58%) patients had carpal tunnel syndrome in Right hand and 19 (42%) patients had carpal tunnel syndrome in Left hand.

Table 3: *Laterality of Carpal Tunnel Syndrome in Hands (n = 46).*

Laterality of CTS in Hands	Frequency	Percentage
Right Hand	27	58%
Left Hand	19	42%
Total	46	100%

Table 4: *Pain Controlled (n = 46).*

Pain Controlled	Frequency	Percentage
Controlled	38	82%
Un-controlled	8	18%
Total	46	100%

Pain control among 46 patients was analyzed as 38 (82%) patients had controlled pain while 8 (18%) patients had uncontrolled pain.

DISCUSSION

Compression of median nerve in carpal tunnel will cause the most common type of entrapment neuropathy "Carpal Tunnel Syndrome". Prevalence is 5.8% among the women and 0.6% among men. Risk factors of carpal tunnel syndrome include obesity, rheumatoid arthritis diabetes mellitus, lupus erythematosis, hypothyroidism, Pregnant females, those females who are taking birth control pills or taking estrogen, repetitive wrist movements, smoking, fractured and/or dislocated wrist bones, bony spurs in carpal tunnel.

Our study shows that mean age was 39.90 ± 3.99 years. Twenty one percent patients were male and 79% patients were female. Eighty two percent patients had controlled pain while 18% patients had uncontrolled pain.

Adams ML[9] reported the mean age 36.6 years. Female were 48%. Pain control was in 86%. Eighteen percent (18%) had no control.

In another study conducted at Abbottabad by Khan AA et al[10] had reported that in 100 total patients 81 were females and 19 were male, 70 were house wives, 9 were teachers, 6 were drivers and 13 belonging to other occupations among them. Patients age range was 32 to 50 years mean age was 39.29 ± 3.99 years. Symptoms duration was from 5 to 24 months. Satisfactory functional outcome was 82% after 1 months follow-up, 94% after 3 months follow-up, 96% after 6 months follow-up. Residual pain was present in 18% patients at 1 month post-operatively, 6% at 3 months and 3% at 6 months follow-up.

Prick JJ[11] reported 82% satisfactory results.

Brown RA[12] had 98% satisfactory results in open and 99% endoscopic release of carpal tunnel syndrome.

CONCLUSION

Our study concludes that 82% of the patients had complete relief of nocturnal pain in patients presenting with carpal tunnrl syndrome after open surgical release.

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OUTCOME OF RELEASE OF CARPAL TUNNEL SYNDROME IN TERMS OF PAIN CONTROL PROFORMA

Case No: _____

Name of the Patient: _____ S/O, D/O _____

Age: _____

Gender M/F: _____

Address:_____

_____

Admission No:_____

Date of Admission: _____

Laterality of CTS in Hands: _____

NCS for CTS: Present/Absent

Pain Controlled	Yes	No
Pain Not Controlled	Yes	No

VISUAL ANALOGUE SCALE FOR PAIN

CONDITION OF PATIENT	SCORE
NO PAIN (Patient is completely comfortable)	0
MILD PAIN (Occasional minor twings, no medication needed)	1
MILD PAIN (Occasional strong twongs, no medication needed)	2
MODERATE PAIN (Pain enough to be distracting, mild pain killers needed)	3
MODERATE PAIN (Can be ignored by diverting the concentration by doing work but still distracting, mild pain killers relieves the pain for 3 to 4 hours)	4
MODERATE PAIN (Can be ignored for any length of time, strong pain killers relieves the pain for 3 to 4 hours)	6
SEVERE PAIN (Interferes with sleep and difficulty in concentration, strong pain killers partially effective)	7
SEVERE PAIN (Physical activity severely a affected. Nausea and dizziness due to the pain	8

CONDITION OF PATIENT	SCORE
SEVERE PAIN (Unable to speak and crying due to pain)	9
SEVERE PAIN (Unconsciousness due to pain)	10

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