

Original Article**Management of Carpal Tunnel Syndrome – Surgical Vs Medical?**Md. Ruhul Kuddus¹, Md. Omar Faruk², Samiul Alam³, K.M Atiqul Islam⁴, S. Alam⁵, Debnath H⁶**Conflict of interest:** None**Funding Agency:** was not funded by any institute or any group.**Contribution of Authors:** None**Copyright:** ©2020bang.BJNS published by BSNS. This article is published under the creative commons CC-BY-NC license. This license permits use distribution (<https://creativecommons.org/licenses/by-nc/4-0/>) reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.**Received:** 19.11.19**Accepted:** 23.02.20**Abstract:****Background:** Carpal Tunnel Syndrome (CTS) is the most common form of entrapment neuropathy. Both the Medical and surgical treatments are popular in the management of CTS. The effectiveness of the surgical treatment of carpal tunnel syndrome (CTS) is well known on short term. Surgical approach has proved to be more efficient relative to the conservative methods of steroid injections and splinting. On the other hand, many studies have demonstrated both advantages and adverse effects of the surgical methods. However, limited data is available about long-term outcome after carpal tunnel release (CTR). So debate is still persists regarding Conservative vs. Surgical approach to treatment of CTS.**Methods:** A retrospective analysis of 15 consecutive cases performed during 1.5 year was conducted. 8 patients were treated surgically with transpalmar approach. 7 patient were treated conservatively. The criteria for treatment efficacy were improvements in symptoms, such as pain, paresthesia and recurrences after surgery.**Results:** Female were predominant 80% than male 20%. Right hand was more frequently affected 80% than left 20%. most patients were diabetic except 2. outcome in the surgical group was excellent. Patient of non-surgical group was not satisfied as surgical group.**Conclusions:** CTR is a robust treatment for CTS and its effect persists after a period of years. CTR is the choice of treatment in case of moderate to severe form of CTS. Long term follow up and inclusion of more cases is needed for a definite conclusion.**Keywords:** Carpal tunnel release; Carpal tunnel syndrome; transpalmar, outcome.*Bang. J Neurosurgery 2020; 10(1): 75-81***Introduction:**

Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy in the upper extremity ^{1,2,3}. The median nerve is compressed within its course through the carpal tunnel just distal to the wrist crease. Usually it occurs in middle-aged patients. Ratio of female: male = 4:1. It is bilateral in over 50% of cases, but is usually worse in the dominant hand and diabetics. Common features of CTS are dysesthesia, characteristically patients are awakened at night by a painful numbness in the hand. Distributions of the symptoms are on palmar side in radial 3.5 fingers.

Hypesthesia in median nerve sensory distribution, 2-point discrimination may be more sensitive test ⁴. Tinel's sign at the wrist is positive in 60% cases. Phalen's test is positive 80% cases ⁵. Common associations of CTS are Job related trauma (repeated movement of hand e.g. carpenter, type writer) Systemic condition – DM, RA, pregnancy, obesity, hypothyroidism and local trauma⁶. Surgical approach has proved to be more efficient relative to the conservative methods of steroid injections and splinting. Carpal tunnel release (CTR) is one of the most frequently performed hand procedures ^{7,8}. Open

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carpal tunnel release is a common surgical treatment for carpal tunnel syndrome⁹. Endoscopic CTR is another popular option of the treatment of severe form of CTS. Some author showed that Endoscopic carpal tunnel release provides the similar efficacy¹⁰. Sometimes we the physician advocate splinting for

the treatment of mild to moderate form of CTS. There is limited evidence that splint worn at night is more effective than no treatment in the short term, but there is insufficient evidence regarding the effectiveness and safety of splinting over non-surgical intervention for CTS¹¹.

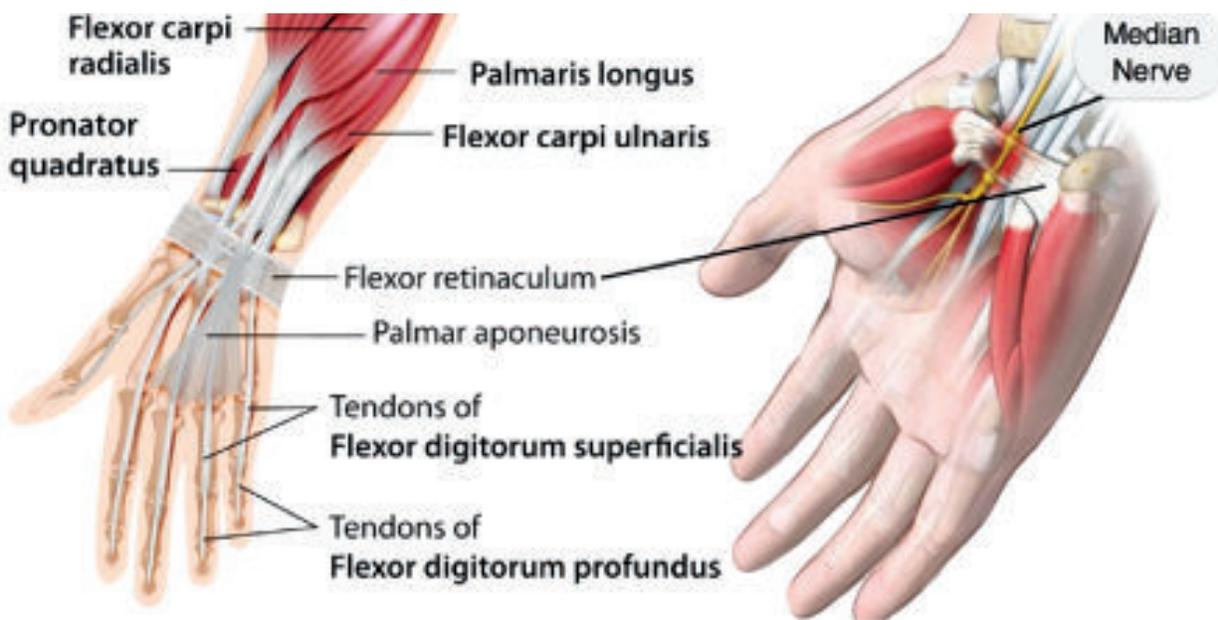
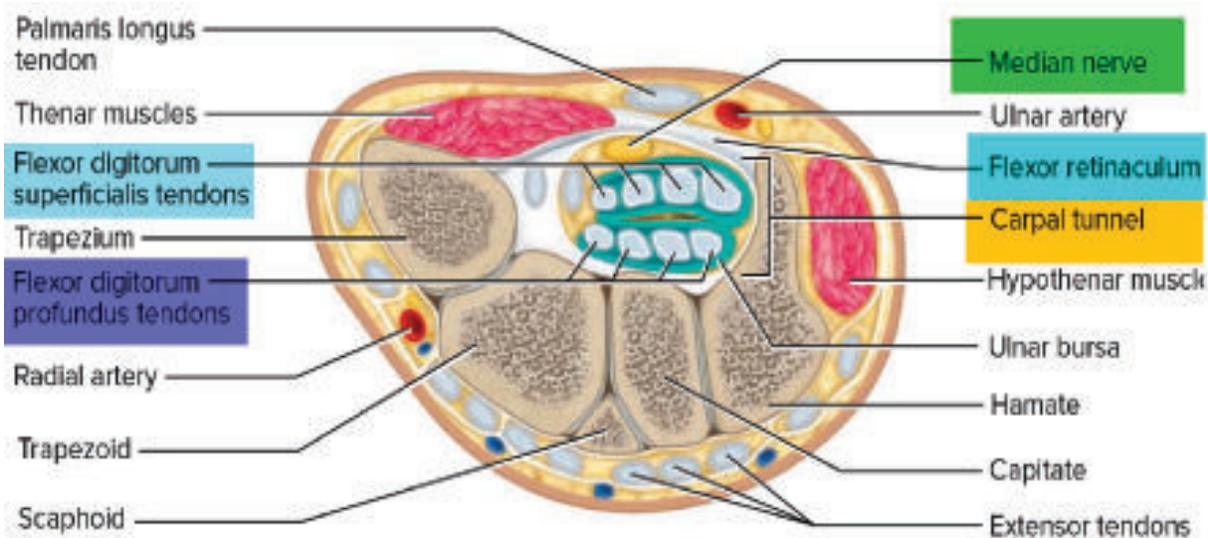


Fig.-1: Anatomy of carpal tunnel ¹⁹



(b) Cross section

Fig.-2: Cross section anatomy of carpal tunnel ¹⁹.

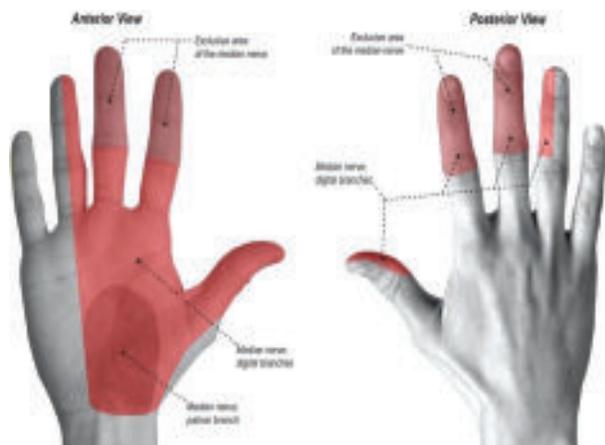


Fig.-3: Sensory distribution of median nerve ¹⁹.

Tinel's sign: Light percussion (tapping) over the irritated median nerve at the flexor retinaculum elicits a tingling sensation ("pins and needles") in the distribution of the nerve.



Photo was taken with kind permission of the patient

Fig.-4: Tine's sign

Methods:

This is a retrospective analytical study. The study population was recruited from two private hospitals. Total 15 cases were primarily enrolled in this study that was managed during the last 1.5 yrs. 7 patients were managed medically & 8 patients were managed surgically. Medical management includes – NSAIDs, Splinting, but I have not given steroid injection. Before



Fig.-5: Phalen's menuever: Maintained flexion of the wrist at a 90° angle for 30-60 seconds reproduces CTS symptoms of tingling of pain.

going for surgery following investigations were routinely done.

Diagnostic tests:

- No investigation is conclusive, diagnosis is clinical.
- CBC
- CRP
- Glucose
- TSH
- NCV – it helps to take decision for surgery.
- ECG

Surgical management: Open CTR was done through transpalmar approach. Mini incision surgery with plain Local anesthetic agents was used. All surgery was done as an out patient basis. I used baby needle for the introduction of LA agents. Incision was made with Number 15 blade. The wound was closed with 3-0 cutting prolene in a single layer. This is a very limited study with short duration. I follow up the patient for last 1.5 years and I assessed post-operative patient's compliance and satisfaction. Clinical examination was done post-operatively to assess the improvement.

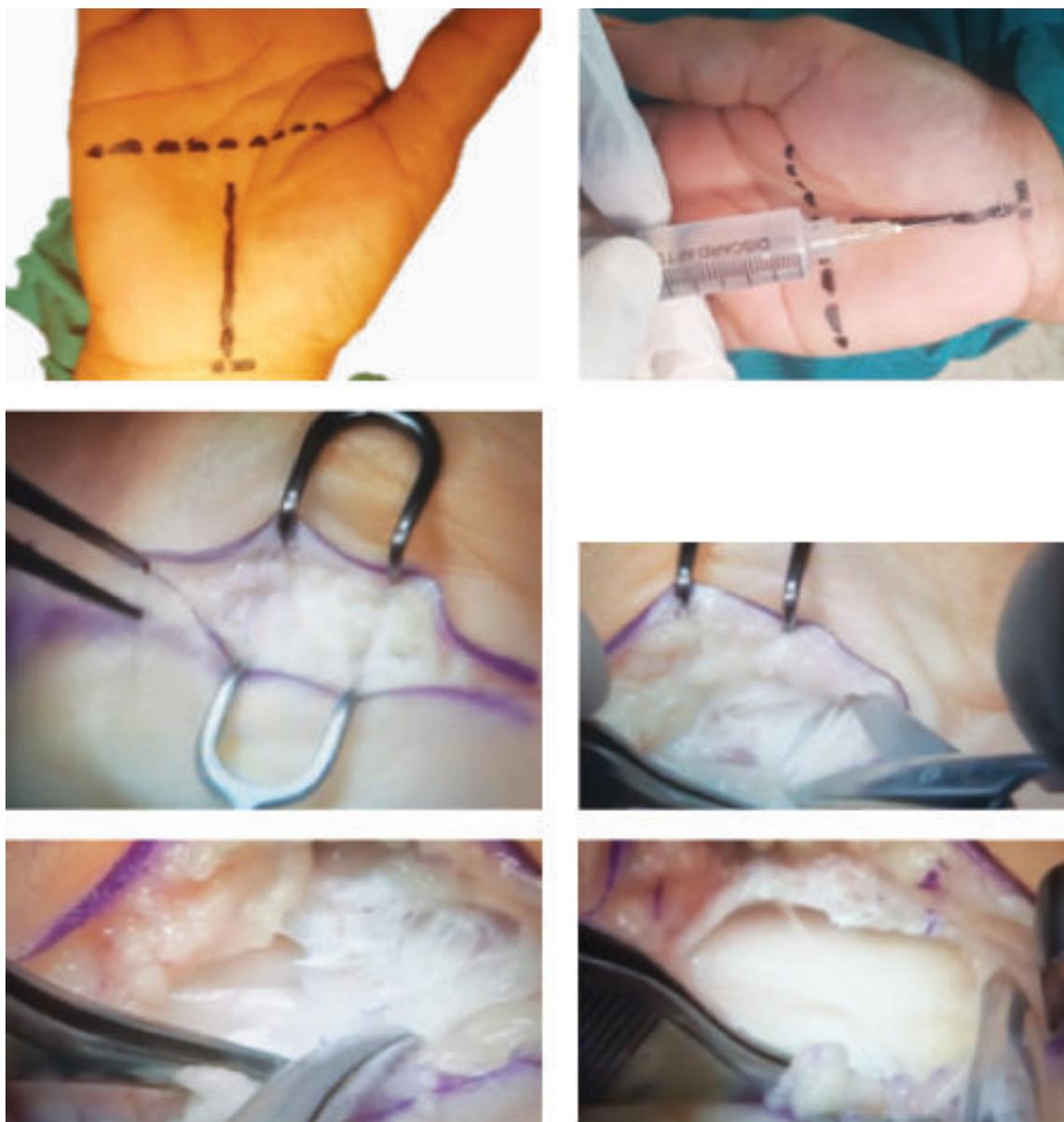


Fig.-6: Steps of surgery

Results:

Table-I

Distribution of the patient according to the age

Age range (Y)	Number of the patient
30-40	2 (13%)
41-50	3 (20%)
51-60	8 (53%)
61-70	2 (13%)
Total	15 (100%)

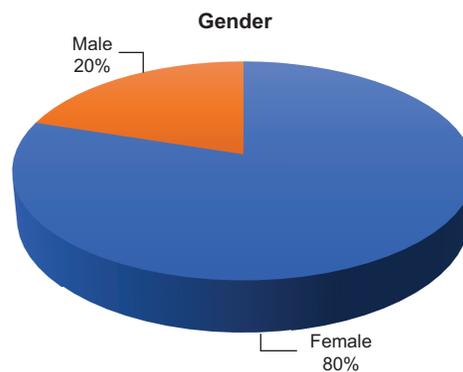


Fig.-7: Diagram shows Male: Female = 4:1

Table-III
Distribution of the patient according to the presenting complaints

Clinical features	Number of the patients
Night pain	15 (100%)
Tingling and numbness	15 (100%)
Weakness of hand grip	8 (53%)
Thenar atrophy	8 (53%)
Clumsiness	12 (80%)
Hypesthesia (loss of 2 point discrimination and poor pin prick sensation in radial 3.5 fingers)	12 (80%)
Phalen's maneuver	13 (86%)
Tinel's test	10 (66%)

Table-IV
Outcome of the patients according to treatment modality.

Rx modality	Number of patients	Level of satisfaction	Follow up
Surgical	8	7 patients were highly satisfied	On short-term follow up only 1 patient had the complain of some degree of weakness
Medical	7	No patients were satisfied even after using splint	After stop medication and splint, symptoms recurred
Total	15		

Result and observation: Total 15 patients were enrolled in this study. Female: Male = 4:1. Common presenting complaints were pain, especially at night and tingling and numbness in the median nerve distribution. Phalen's maneuver is a specific and sensitive test for severe form of CTS. Regarding investigation NCV is very much helpful to take decision

for surgery. Patients of surgical group were highly satisfied where the patients treated with medical management and splinting were not satisfied, although they have transient improvement.

Follow up: On follow-up after 1.5 yr, patient has no scar mark. One patient has partially improved her thenar atrophy (fig-7).



Fig.-7



Fig.-8

Discussion:

In our study, female were significantly dominant than male. Diabetes was the common association with CTS. Common presenting symptoms were pain, tingling, numbness, and decreased sensation in the median nerve distribution. Phalen's and tinel's test are helpful for

diagnosis. NCV is the only investigation that is helpful to distinguish the disease severity and to take decision for surgery. Important finding of this study is the outcome of conservative treatment and surgical treatment. On follow-up the outcome of surgical treatment (open CTR) was encouraging. On the other hand, splinting and NSAIDS has transient benefits and relief from pain.

The results of the present study show that long-term results of open carpal tunnel release are favorable. Eighty- seven percent of patients reported good symptom scores (<2 points) and 74% reported good function scores (<2 points). Eighty-eight percent of the patients were completely or very satisfied. We hypothesized that nocturnal pain, which is characteristic of nerve irritation due to carpal tunnel syndrome, will be present in a small minority of patients. The problems reported more frequently, such as daytime pain, weakness, and trouble opening jars, are less specific to carpal tunnel syndrome and may be attributable to other comorbidities such as osteoarthritis or rheumatoid arthritis. Our finding that carpal tunnel syndrome confounding comorbidities, such as rheumatoid arthritis, diabetes mellitus, polyneuropathy, and osteoarthritis, are associated with pain and function scores supports this hypothesis ¹².

While numerous studies have noted the excellent early ^{13, 14} results of open carpal tunnel release, the durability of clinical results has remained uncertain. A recent study¹⁵ has claimed that surgical outcomes after five years were only marginally better than nonsurgical outcomes. Other studies have described noticeable returns of at least some preoperative symptoms, on the order of 57%¹⁶ and 25%¹⁷.

Another study suggests that the long-term results of open carpal tunnel release are excellent, with patients experiencing consistent pain relief over ten to fifteen years. The rate of re- operation was very low, at 1.8%. A high percentage of patients reported excellent results, high levels of satisfaction, and improvements in their quality of life ¹².

CTR has a favorable outcome and good rates of satisfaction, even in patients with bilateral severe CTS at a mean of nine years after surgery. Endoscopic CTR has a higher rate of numbness resolution than open surgery. There were no significant differences in outcome between the dominant and non-dominant hand ¹⁸.

Limitations

- Very limited number of patients
- Short term follow-up

Take home message

- Surgical results of peripheral nerve disorders are very encouraging & rewarding.
- So every neurosurgeon can entertain all kinds of peripheral nerve surgery.

Conclusion:

CTR is the choice of treatment in case of moderate to severe form of CTS. Long-term follow up and inclusion of more cases is needed for a definite conclusion.

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