



## Endoscopic Carpal Tunnel Release- Operative technique for Carpal Tunnel syndrome

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### ABSTRACT

**Background:** Endoscopic carpal tunnel release is a new technique of treatment for carpal tunnel syndrome. To study the advantages and disadvantages of endoscopic carpal tunnel release

**Materials and methods:** Endoscopic technique in 37 patients who had clinical signs and symptoms, Nerve conduction test consistent with carpal tunnel syndrome. The patients were followed up at one week, three weeks, six weeks and six months.

**Results:** The symptoms of carpal tunnel syndrome were relieved in 36 (97 per cent) of 37 hands. Only 1 of the 35 hands were tender at 6 weeks. No patients had thickened scar at 6 months. The patient could return to work early (ten days)

**Conclusion:** This study shows that Indian patients with carpal tunnel syndrome get similar result but with less morbidity after the endoscopic technique. This technique will become more popular once more surgeons are well trained in doing this technique.

**KEYWORDS :** Carpal Tunnel Syndrome, endoscopic release, Scar tenderness

### Introduction

Carpal tunnel syndrome is caused by the development of venular congestion of the synovial membrane causing inflammation. The Pressure of the carpal tunnel is increased, leading to entrapment of the median nerve and pain. Repeated shaking of the affected hand to relieves these symptoms but increases the degeneration of the epineurium and endoneurium, thereby causing decreased axonal transmission.<sup>(1,2)</sup>

Open carpal tunnel release was described by Cannon in 1946.<sup>(6)</sup> Phalen described the division of the transverse carpal ligament (TCL) for the first time in 1950.<sup>(4)</sup> This method was accepted as technique for the surgical management for carpal tunnel syndrome. However, the disadvantages including pillar pain around the incision site on the transverse ligament, scar tissue tenderness, and delays in returning to activity of daily living, including work has been identified.<sup>(14)</sup>

Endoscopic release is a relatively new technique. This technique was to overcome the problems seen in the open technique due to cutting of the palmar fascia. Studies prior to the present one have shown a decreased incidence of scar tenderness and shorter interval for return to work.<sup>(5)</sup> This study was to see if Indian patients show better results i.e. earlier return to work, no scar pain and reduced scar tenderness

### Materials and methods

Cases were selected on the basis of pain, numbness, paresthesias or weakness in the distribution of the median nerve at the wrist and the Tinel and Phalen provocative tests. Electrophysiological confirmation was established when distal motor latency values were greater than 4.5 milliseconds

The preoperative treatment had ranged for a period from 2 months to 2 years; this depended on the patient's symptoms, the objective clinical findings and whether there is response to non-operative measures.<sup>(9)</sup>

The average age of the patients was forty two years (range, thirty to fifty seven years). There were 25 women and 12 men. Preoperative Assessment Two point discrimination:- 0 to 6 millimeters, normal result; 7 to 10 millimeters, fair and 11 to 15 millimeters, poor. The quantitative Phalen test was positive if the median nerve-distribution sensation diminished one level on flexion of the wrist.<sup>(4)</sup> Thenar atrophy was recorded as 0 (absent), 1 (mild), 2 (moderate), or 3 (severe). The power of abductor pollicis brevis was measured and graded from 0 to 5.<sup>(12)</sup>

### Operative method

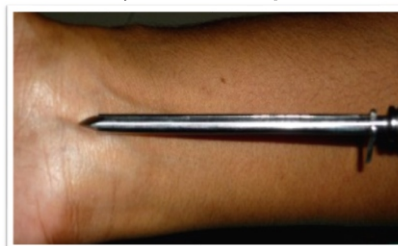
Two portal endoscopic carpal tunnel release was performed with under local anesthesia. A 2 cm transverse incision was made proximal to the crease of the wrist in flexion (Figure 1). The transverse carpal ligament was visualised. A 4 to 5 millimeter incision put on the transverse carpal ligament. Dissection with artery forceps was done to release the synovium from the ligament. The wrist was extended by 30 degree and the trocar and sheath assembly were put through the proximal incision and the carpal canal, and incision was made distally over the skin and palmar fascia at the level of the meeting of the line from the thumb and the 4th finger. The 30 degree endoscope was inserted into the proximal portal and the undersurface of the ligament was examined. An BP knife with size 11 blade directed upwards was then inserted through the distal end of the cannulated sheath through the distal portal and the ligament was cut from distal to proximal.<sup>(16)</sup>

Adequate release of the ligament was confirmed, and the sheath and endoscope was removed. The incisions were closed with skin staples. A sterile dressing was applied.

### Postoperative evaluation

The patient was called for review after one week. Suture were removed after 1 week.

**Figure 1:- Point of entry of the endoscope.**



These patients returned to their activities which they could tolerate. They were instructed to avoid heavy work and increased activity with the hand. The patients were assessed at three weeks, six weeks and six months postoperatively. All patients were given a questionnaire and an evaluation chart with symptoms and function.<sup>(17)</sup>

Tenderness to palpation of the scar and the surrounding palmar fascia, numbness and paresthesias was obtained and was graded according to intensity and the area, with 0 indicating no symptoms; I, mild symptoms; II, symptoms equal to those preoperatively; and III, symptoms worse than those preoperatively. Patients were also

assessed on a scale of 0 to 100 per cent, based on their level of satisfaction with the result

**Figure 2:- Scar following endoscopic release.**



### Results

Thirty four patients (thirty seven hands) had endoscopic carpal tunnel release. Three had an endoscopic procedure bilaterally. Twelve patients had open release in one hand and endoscopic release in the other.

Tenderness of the scar differed significantly at the latest follow-up visit ( $p < 0.05$ ). 21 (57 per cent) of 37 hands were tender at 1 week. 10 of 37 hands were tender at 3 weeks. 1 of the 37 hands was tender at 6 weeks.

No patients had thickened scar at 6 weeks. The patient could return to work (ten days) for the endoscopic-release

### Time and Cost

The mean time for the procedure was forty five minutes for endoscopic release. The longer duration was for setup of endoscopic instruments.

### Complications

One complication occurred in the patients who had endoscopic release. One patient had increased numbness in the index finger postoperatively. The numbness resolved completely over a period of two weeks.

### Discussion

Open carpal tunnel release has become the operative procedure of choice for relief of symptoms in patients who have compression of the median nerve at the wrist that has not responded to non-operative measures. Previous studies have shown that this procedure provides lasting alleviation of symptoms in more than 80 per cent of patients.<sup>(19)</sup> Endoscopic carpal tunnel release was introduced recently as an alternative technique in an effort to decrease the morbidity. Early studies have shown that the endoscopic method provides relief of symptoms and signs in 79 per cent of hands.<sup>(18)</sup> The increased number of carpal tunnel releases being performed has increased the focus on patient outcome factors i.e., postoperative pain, weakness and return to function and work.

The possibility of improved outcomes has produced marked interest in the endoscopic method. Division of palmar fascia above the transverse carpal ligament (TCL) is done in the open carpal tunnel operation.<sup>(1,2)</sup> The healing of these superficial tissues results in tenderness over the scar and wound for some time after the procedure. This tenderness of the wound and the scar may decrease grasp strength and delay a return to full hand function after the surgery.<sup>(4)</sup>

In our study, tenderness of the scar was found to be markedly lesser. The most important of the functional<sup>(18)</sup> outcomes may be the interval between the operation and the return to work and daily activities.

In our study there was less limitation in the performance of activities of daily living. The patients who had endoscopic release returned to work quickly. Two portal endoscopic release is a better treatment option for Indian patients with carpal tunnel syndrome. This will

become more popular when more surgeons become well trained in this technique. The current study has several limitations in that the study is not a comparative one; it is self reported and subject to bias.

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