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RESEARCH ARTICLE
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THE OUTCOME OF RETINACULOTOMY FOR CARPAL TUNNEL SYNDROME AT NORTHWEST GENERAL HOSPITAL AND RESEARCH CENTER PESHAWAR

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ABSTRACT

Objective: The objective of this study is to know the functional outcome of Flexor Retinaculotomy for Carpal Tunnel Syndrome in our part of the world by local anesthesia.

Methods: This prospective study was carried out after ethical approval, from August 2022 to August 2023, at Northwest General Hospital and Research Center in Peshawar, Pakistan.
Total patients included in the study were 48, all having bilateral Carpal Tunnel Release (CTR), so the total number of CTRs performed are 98. The diagnosis of CTS was made by clinical examination and confirmation by Nerve Conduction Studies (NCS). Findings included median nerve distribution numbness, nocturnal paresthesia, thenar muscle weakening and atrophy may or not be present, positive Tinel's sign, and/or painful Phalen's maneuver. NCS were also used to undertake electrodiagnostic confirmation of the diagnosis. All patients' NCS data supported mild to severe CTS.

Results: Total number of CTRs performed are 98 having mostly (89%) female patients and less (11%) male patients. Patients' ages ranged from 15-68 years with a mean age of 41 years. Improvement in pinch grip was assessed using the MRC grading system. It was believed that a typical pinch grip had 5/5 power, whilst a weak pinch grasp had 4/5+ power.
Pinch grip improved up to 51% by 2nd week and 100% by 4th week.

Conclusion: Carpal tunnel release with standard 3-4cm longitudinal incision has good functional outcome in terms of pinch grip, opposition, return to work, pain and paresthesia of the fingers.

Keywords: Flexor Retinaculotomy, Carpal Tunnel Release, local anesthesia

Introduction

At 4% to 5% of the general population, carpal tunnel syndrome is the most prevalent form of compressive neuropathy affecting the upper limbs **(1)**. It is more common in the 40–60 age group, affects women more often than males, and is typically bilateral. Three risk factors for the illness are rheumatoid arthritis, obesity, pregnancy, repeated wrist motions, and family history **(2)**. Treatment options include conservative measures, the most popular of which include the use of orthotic devices and local corticosteroid injections. In recent times, nerve excursion exercises have demonstrated a decrease in the quantity of surgical procedures **(3)**.

An option to expedite functional recovery is nerve excursion **(4)**. Although there is currently little evidence to support them, other treatments for this illness, such as shockwave therapy and platelet-rich plasma injections **(5)**, are being investigated. Research indicates that when it comes to symptom improvement, hand function, and the likelihood of recurrence, surgery is generally more beneficial than conservative treatment **(6)**. The patient and surgeon should, however, consider the optimal timing for surgery because the patient's symptoms may not always correspond with the results of an electroneuromyography or physical examination **(7).**

The surgical options include retinaculotomy through the transverse wrist skin crease incision, endoscopic technique, ultrasound guided mini open surgery **(8)**, Chinese nasal instrumentation technique, and a technique that does not require the use of any instruments: open surgical decompression through classic incision.

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Methods:

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We perform CTR without tourniquet, using local anesthetic (10ml of 2% lidocaine in combination with adrenaline). Co-Amoxiclav 1.2g Intravenous STAT dose antibiotics are given before starting the procedure. Then hand is prepped with Chlorhexidine and draped with sterile towels. A 3-4cm longitudinal incision is placed over carpal tunnel. Fascia is also cut reaching to Transverse Carpal Ligament (TCL). TCL is either cut with a scalpel or a scissor. Proximal and distal TCL is cut using nerve protector. Hemostasis secured using Bipolar Electrocautery carefully. Skin is closed with Polypropylene. Aseptic dressing applied and post-operative oral Co-Amoxiclav advised for 3 days to avoid post op infection. Post op fingers flexion extension physiotherapy is advised and called for 1st follow up after 2 weeks for wound examination and stitches removal.

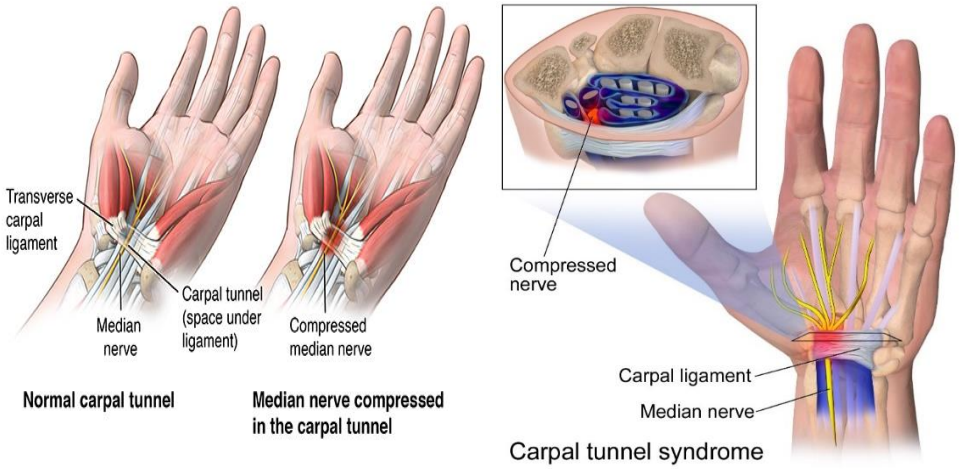


Figure 1: Showing Normal Carpal Tunnel and CTS with median nerve compressed by TCL.

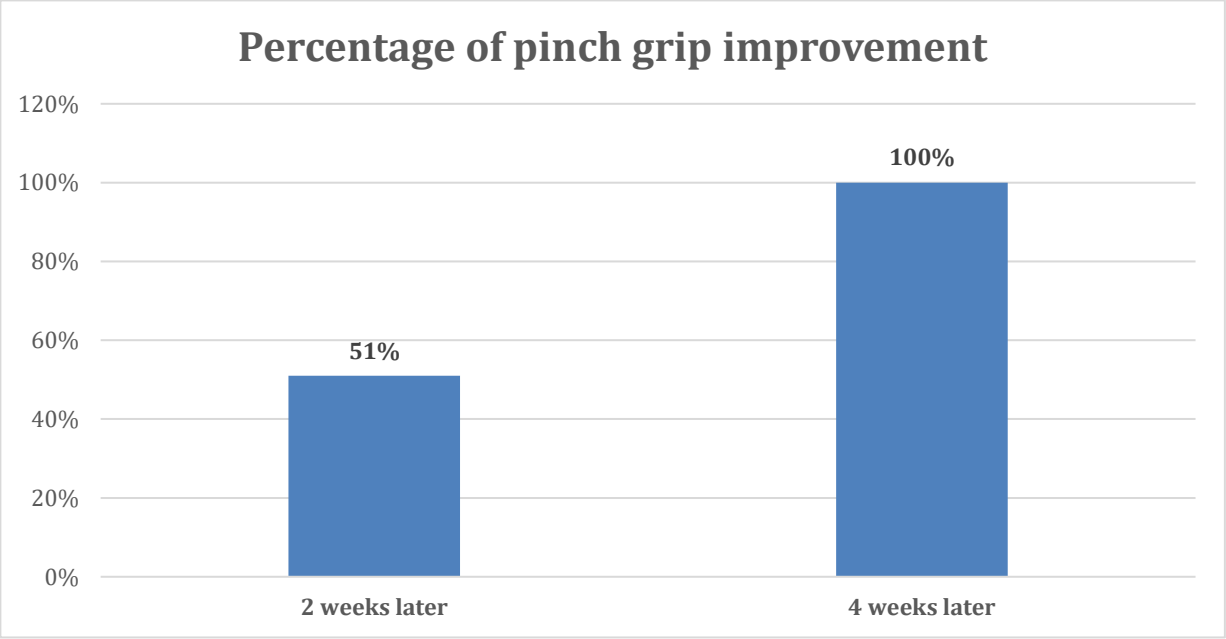
Results:

Total number of CTRs performed are 98 having mostly (89%) female patients and less (11%) male patients. Patients' ages ranged from 15-68 years with a mean age of 41 years. Improvement in pinch grip was assessed using the MRC grading system. It was believed that a typical pinch grip had 5/5 power, whilst a weak pinch grasp had 4/5+ power. Pinch grip improved up to 51% by 2nd week and 100% by 4th week. **Table 1, figure 2.** All the patients returned to daily life activities by the end of 3rd week. There were no complications in our patients.

Table 1: Frequency of pinch grip improvement after CTR.

Week	Pinch grip improved, n=98
2 weeks later	50
4 weeks later	98

Figure 2: Percentage of pinch grip improvement after CTR.



In the study, it was found that 4.5% of patients were at level 5 on the Visual Analog Scale (VAS), 61.4% were at level 6, 27.3% at level 7, and 6.8% at level 8. This indicates that the majority of patients, 61.4%, falls at level 6 on the scale.

Post op thumb opposition, paresthesia or numbness of the fingers, Pain on VAS improved by 5 weeks. Almost all patients returned back to their normal routine one month post op. Details are shown in table 2 below.

Table 2: Post op improvement in outcome parameters.

Opposition	87% improved by end of 4th week.
Paresthesia of the fingers	83% improved by 5th week.
Return back to work	100% returned to works by 4th week.
Pain on VAS	92% patients had Score 2 at the end of 4th week.

VAS: Visual Analog Score.

Discussion:

One of the most prevalent neuropathies affecting the upper limb peripheral nerves is carpal tunnel syndrome. Over time, carpal tunnel decompression surgery has changed to reduce the risks involved in the surgical operations. For surgical decompression of the median nerve, the typical open CT release has proven to be the best method. While the direct visualization of the structures is a benefit of this treatment, there are potential consequences that could arise, including painful scarring, neurosensory impairments, and neuromas. The problems may result in a reduction in hand strength and life quality **10**.

Up to 81% of cases of carpal tunnel syndrome are in women **11**. This is in contrast to our study, which found that 85% of the women were affected. Heavy laborers, typists, carpenters, and milkmen are the groups most impacted, aside from women. The interplay of numerous systems leads to the intricate pathophysiology of CTS. Traction neuropathy and excessively high carpal tunnel pressure are most likely responsible for the pathophysiologic mechanism of CTS **12.**

In our study, up to 92% of patients showed improvement. The studies that were cited have improved a little bit **10,12**. By the fourth week, the visual analogue scale score dropped from 6 to 1 or 0. This is consistent with an international investigation that found that by the fourth week, the VAS had decreased from 4.5 to 0.5.**13** In our trial, functional outcomes also remained good, and by the end of the fourth week, nearly all of the patients had returned to their jobs. This aligns with both domestic and global outcomes.**14, 15.** Nearly all of the patients in our trial showed improvement in their pinch grasp at the end of the fourth week. This is in contrast to the mentioned international data. **16,17**. The main limitation of this study is small sample size. Outcome variables can be improved and increased in number in future studies.

Conclusion:

Carpal tunnel release with standard 3-4cm longitudinal incision has good functional outcome in terms of pinch grip, opposition, return to work, pain and paresthesia of the fingers.

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