

Type of the Paper (Research Article)

Splinting versus non-splinting following Carpal Tunnel Release for Carpal Tunnel Syndrome Treatment

Kamal M. S. Abdel Meguid¹, Ibrahim M. M. Mahmoud¹, Ahmed R. F. Sayed¹, Mostafa A.

H. Ali^{1*}

¹Orthopedic Surgery Department, Faculty of Medicine, Fayoum University, Fayoum, 63514 Egypt.

*Correspondence: Mostafa A. H. Ali, mah17@fayoum.edu.eg, Tel: (002) 01003345145.

Received:	19 September, 2024	Reviewed:	26 December, 2024
Accepted:	17 February, 2025	Published online:	20 March, 2025

Abstract:

Introduction: Carpal tunnel syndrome, the most frequent peripheral nerve neuropathy, can be managed with non-invasive methods in the beginning, but surgery is recommended for more severe cases. Some surgeons support an early range of motion, while others prefer using a splint instead.

Aim of the study: This study aims to clarify the benefits of different postoperative regimens after carpal tunnel decompression - a below elbow slab and elastic bandaging, and to analyze their impact on functional results.

Subjects and Methods: We enrolled 40 individuals with this idiopathic condition who did not show improvement with conservative therapy. Two sets of patients were divided: Group I did not have a splint post-surgery, whereas Group II had a splint for three weeks. The rapid DASH scoring technique was utilized for assessment.

Results: A post-operative follow-up revealed that, in terms of the fast DASH score, there was no appreciable difference statistically (p-value >0.05).

Conclusion: In comparison to the range of motion right after open carpal tunnel release surgery, immobilizing the wrist for the first three weeks after surgery did not show a significant enhancement in functional outcomes.

Keywords: Carpal Tunnel Syndrome; splint; Median nerve.

1. Introduction

Carpal tunnel syndrome, the most predominant limb neuropathy, was first documented by Sir Paget in 1854 [1]. In most cases, increasing wrist flexion raises pressure within the compartment by squeezing the carpal tunnel. Subsequent incidents could lead to the wasting of the thenar muscles [2]. Decompression median nerve in the carpal tunnel is a commonly used and efficacious surgical technique. Rare yet harmful adverse effects consist of painful scarring, surgical mishaps, median nerve damage, and enduring symptoms [3].

Numerous research studies have investigated the impacts of splinting, electrical stimulation, topical herbal

2. Subjects and Methods

2.1. Subjects

We enrolled 40 patients suffering from idiopathic carpal tunnel syndrome who did not show improvement after one month of conservative treatment. Patients were divided into two categories: Group I did not have a slab post-surgery, whereas Group II had a slab for three weeks.

Inclusion criteria

- Adult male or female with clinically and/or electro-physiologically confirmed Carpal Tunnel Syndrome.
- The patient who approved the preoperative consent and completed the follow-up.

Exclusion criteria

- Pediatric patients.
- Revision carpal tunnel surgery.

treatments, cold treatment, extremity elevation, and a complete rehabilitation regimen following surgery [4].

Our research analyzed the functional outcomes and assessed the pros, cons, and effectiveness of two different postoperative treatments following carpal tunnel release: below-elbow splinting and elastic band wrapping.

- Patients who did not receive conservative treatment.
- Patients who didn't complete the follow-up.
- Double crush syndrome patients.
- Patients with neck pain-related cervical spondylosis.

2.2. Study design

This orthopedic study is prospective departmental randomized comparative research conducted at Fayoum University The Hospital. mini-open technique was utilized for decompressing the median nerve in this study. After administering anesthesia, a tourniquet was applied. Following the lateral edge of the ring digit, a long incision was made at the bottom of the palm. The cut ends before reaching the far wrist flexion crease towards the top and is marked by the Kaplan line at the bottom. A sharp partition of the flexor retinaculum safeguarded the contents of the tunnel. After that, study members were allocated to one of two groups in a random way immediately post-surgery. Group A received a dense, plush bandage. Group B had their wrists positioned in a 15° extended posture.

2.3. Statistical Methods

Data was collected, coded, and analyzed using SPSS version 22 on a Windows 7 operating system (SPSS Inc., Chicago, IL, USA).

3. Results

There was no statistically appreciable variation between the two groups regarding sex and age. The mean ages were 38.9 ± 11.9 and 42.8 ± 11.6 years for groups I and II, respectively (*p* =0.3). All patients in both groups were females.

Furthermore, no statistically appreciable variation between the two groups regarding thenar atrophy and side was observed. Four patients in Group I suffered from thenar atrophy while in Group II they were two individuals. In group I, the operation was done on the right wrist in 10 individuals and the other 10 individuals were on the left side while in group II, the operation was done on the right wrist in 12 patients and the other 8 patients on the left side (**Table 1**).

Table 1: Comparisons of lesion characteristics in the two group	Та	b	le 1	l:	C	ompariso	ns of	les	ion (characte	ristics	in	the	two	group	s.
--	----	---	------	----	---	----------	-------	-----	-------	----------	---------	----	-----	-----	-------	----

5	Group I (n =20)	Group II (n =20)	<i>P</i> -value	
No	16 (80%)	18 (90%)	0.66	
Yes	4 (20%)	2 (10%)	0.00	
Right	10 (50%)	12 (60%)	0.75	
Left	10 (50%)	8 (40%)	- 0.75	
	No Yes Right Left	Group I (n =20) No 16 (80%) Yes 4 (20%) Right 10 (50%) Left 10 (50%)	Group I (n =20) Group II (n =20) No 16 (80%) 18 (90%) Yes 4 (20%) 2 (10%) Right 10 (50%) 12 (60%) Left 10 (50%) 8 (40%)	

There was no statistically appreciable variation in the pre-operative evaluation between study groups. The average quick DASH score in Group I was 69.8 ± 8.2 , while in Group II it was 67.7 ± 12.02 (*p* =0.53) (**Figure 1**). A follow-up

after surgery revealed that there was no significant difference in the fast DASH score. The average quick DASH score was 9.9 \pm 8.9 in Group I and 7.02 \pm 10.2 in Group II (*p* =0.33) (**Figure 2**).



Figure 1: Pre-operative comparison between two study groups' quick DASH score.



Figure 2: Post-operative comparison between two study groups' quick DASH score.

4. Discussion

After conservative approaches fail, carpal tunnel decompression is the preferred therapy for median nerve entrapment. Some North American surgeons use a splint after carpal tunnel release surgery to avoid pain, altered sensation, carpal arch widening, and flexor tendon bowstringing.

Other surgeons recommend early mobility to facilitate nerve longitudinal sliding over the surgical bed. Also, postoperative splinting may have delayed return to work or regular activities.

About pre-operative evaluation of fast DASH, demographic and lesion characters, there was no statistical difference between research groups. This suggests both groups had similar symptom intensity.

We monitored patients using a fast DASH score due to its worldwide recognition and reliability. The brief DASH survey evaluates limitations in the arm, shoulder, and hand for individuals aged [5, 6]. Many previous studies used that, as well [7-13].

To make the presence or absence of a post-operative splint the primary difference between the two groups, one surgeon operated on all patients in the same manner while another blinded to their group took measures. Many other studies reported the same concept 3, 10, 12].

Following surgery, the patient underwent post-operative care for three months. We believed it was sufficient for hand therapy. In different studies, the length of follow-up varied. Bhatia et al. (2000) checked on patients after just two weeks [11], while others followed up for up to six months [1, 7, 9, 10]. Logli et al. (2018) conducted a 12-month follow-up on patients [8]. These authors did not provide a reason for selecting this specific follow-up time.

Previous studies used the splint for two weeks [8, 9, 11, 13]. Others used two days [11] and one week [7]. The authors did not provide a rationale for selecting splint duration.

5. Conclusion

Immobilizing the wrist during the initial three weeks after open carpal tunnel release surgery does not lead to better functional results than allowing an immediate range of motion after the operation. **Funding:** The authors do not have any financial sources to disclose for this manuscript.

References

- Bury TF, Akelman E, Weiss APC. Prospective, randomized trial of splinting after carpal tunnel release. Ann Plast Surg. 1995;35(1):19–22. doi:10.1097/00000637-199507000-00004.
- Piazzini DB, Aprile I, Ferrara PE, Bertolini C, Tonali P, Maggi L, et al. A systematic review of conservative treatment of carpal tunnel syndrome. Clin Rehabil. 2007;21(4):299–314.

doi: 10.1177/0269215507077294.

- Karl JW, Gancarczyk SM, Strauch RJ. Complications of carpal tunnel release. Orthop Clin North Am. 2016;47(2):425–33. doi:10.1016/j.ocl.2015.09.008.
- Gil JA, Weiss B, Kleiner J, Akelman E, Weiss APC. A prospective evaluation of the effect of supervised hand therapy after carpal tunnel surgery. Hand (N Y). 2020;15(3):315– 21. doi:10.1177/1558944719868412.
- 5. Hawker GA, Mian S, Kendzerska T, French M. Measures of adult pain: Visual Analog Scale for Pain (VAS Pain), Numeric Rating Scale for Pain (NRS Pain), McGill Pain Questionnaire (MPQ), Short-Form McGill Pain Questionnaire (SF-MPQ), Chronic Pain Grade Scale (CPGS), Short Form-36 Bodily Pain Scale (SF-36 BPS), and Measure of Intermittent and Constant Osteoarthritis Pain (ICOAP). Arthritis Care Res.

Conflicts of Interest: All authors declare they have no conflicts of interest.

AI declaration statement: Not applicable.

2011;63(S11):S240–52. doi:10.1002/acr.20543.

- Levine DW, Simmons BP, Koris MJ, Daltroy LH, Hohl GG, Fossel AH, et al. A selfadministered questionnaire for the assessment of severity of symptoms and functional status in carpal tunnel syndrome. J Bone Joint Surg Am. 1993;75(11):1585–92. doi:10.2106/00004623-199311000-00002.
- S A, Mh NH, A A, S J. Splinting after carpal tunnel release: Does it really matter? MOJ Orthop Rheumatol. 2015;9(2):41–6.
- Logli AL, Bear BJ, Schwartz EG, Korcek KJ, Foster BJ. A prospective, randomized trial of splinting after mini-carpal tunnel release. J Hand Surg Am. 2018;43(8):775.e1–6. doi:10.1016/j.jhsa.2018.02.004.
- Cook AC, Szabo RM, Birkholz SW, King EF. Early mobilization following carpal tunnel release: A prospective randomized study. J Hand Surg Am. 1995;20(2):228–30. doi:10.1016/S0363-5023(05)80006-4.
- Finsen V, Andersen K, Russwurm H. No advantage from splinting the wrist after open carpal tunnel release: A randomized study of 82 wrists. Acta Orthop Scand. 1999;70(3):288–92.

doi:10.3109/17453679908997816.

 Bhatia R. Does splintage help pain after carpal tunnel release? J Hand Surg Br. 2000;25(1):150. doi:10.1054/jhsb.1999.0329.

- Cebesoy O, Karalezli N, Baltaci ET, Akyildiz F, Tutar E, Isik M. Use of a splint following open carpal tunnel release: A comparative study. Adv Ther. 2007;24(2):478–84. doi:10.1007/BF02877724.
- Martins RS, Siqueira MG, Simplício H. Wrist immobilization after carpal tunnel release: A prospective study. Arq Neuropsiquiatr. 2006;64(3B):596–9. doi:10.1590/S0004-282X2006000400012..