

Current Practice Patterns After Carpal Tunnel Release. A Survey of Clinical Practice Trends Across the World

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ABSTRACT

Study design: Observational study.

Introduction: The adoption of evidence-based practice (EBP) principles is advocated by many professional organizations. This survey investigated the current practice patterns of prescribed interventions following carpal tunnel release.

Purpose of the study: To gain a better understanding of the quality of post-operative care provided to adults after carpal tunnel release across the world.

Methods: An Internet-based survey with 15 items was designed to address the study aims outlined above using the Google database online electronic survey program to determine the practice patterns after carpal tunnel release.

Results: Our study identified the variability in the management of the intervention after Carpal tunnel release of 21 different countries. A total of 78 questionnaires were returned. 85% of the participants prescribed home exercises as part of their rehabilitation program.

Conclusion: There is insufficient evidence to support a superior treatment intervention after CTR and there exists a large variability in the approach after Carpal tunnel surgery.

Level of Evidence

Not applicable.

KEYWORDS

Carpal Tunnel Decompression; Splint; Median Nerve; Median Neuropathy; Carpal Tunnel Syndrome Release Post-Surgical Intervention.

INTRODUCTION

Since Phalen popularized the diagnosis and treatment of carpal tunnel syndrome (CTS) in the 1950s [1, 2] there has been continued debate over the optimal management of the condition regarding conservative treatment, surgical approach, and post-surgical intervention.

The goal of postoperative rehabilitation is to speed up and en-

hance symptom resolution and restore functional recovery following surgery. Although the evidence base for rehabilitation for hand conditions has grown throughout the last decade, evidence and guidelines for the use of specific interventions after CTR (carpal tunnel release) are limited. Studies suggest postsurgical treatment intervention should combine different methods of scar treatment and numerous strategies for con-

trolling edema as well as passive, assisted and active mobilization, strengthening, and functional exercises and the gradual progression of activities [3-8]. However, no clinical practice guidelines exist regarding the optimal post-surgical approach. None of the studies that addressed the effectiveness of the variety of interventions have been described with high quality evidence [3-8]. Literature provides us with an overview of the effectiveness of various rehabilitation treatments to optimize results following CTR compared with no treatment, placebo, or another non-surgical intervention [3-8]. No evidence-based practice survey has been performed to assess the current practice patterns around the globe after carpal tunnel release.

The aims of this research study was to assess the practice patterns around the globe after carpal tunnel release interventions.

METHODS

Development of the survey

In order to assess the current practice patterns of physical and occupational therapies regarding interventions after CTR, an internet-based survey was designed to address the study aims outlined above using the Google database online electronic survey program. A total of 78 occupational and physical therapists were contacted between September and December 2017 through social networks. Therapists were invited to participate voluntary on the survey and were directed to a Web site link containing the electronic survey. No incentives were provided to participants.

The survey was piloted among the author’s co-workers to check for question clarity and necessary edits were completed following the pilot test. The survey consisted of a total of 15 questions. The first five questions addressed demographic information of the respondent; the next ten questions asked the frequency of use of the different intervention techniques described in the literature [9-11]. All the items were multiple choice questions. Questions were developed with consideration of the current evidence regarding the post-surgical treatment of carpal tunnel syndrome. Demographic analysis of the responses was performed.

Survey administration

The survey was administered through social networks (Facebook and Twitter). In an effort to maximize the response rate, an invitation to participate in the survey was distributed on three different occasions with a one-week interval between invitations. A link to the survey site database was included in the invitation.

RESULTS

Our study identified variability in the management of the intervention after CTR around different countries. A total of 78 questionnaires were returned. It is impossible to determine the response rate because survey participation was solicited via the Internet through social media. Of the respondents, 62% (48) were physical therapists and the remaining 38% (30) were occupational therapists representing 21 different countries. The highest country represented was Spain with 31% (24). The majority of respondents 54% (42) indicated that they were employed in private practice. Twenty-seven percent (21) respondents indicated that they had been practicing between 2-5 years and 76% (59) reported that they treated less than ten patients that received carpal tunnel release in a month.

Regarding the different therapeutic interventions used by therapists in the first two weeks after CTR, sensory reeducation and gliding exercises were the reported treatments for 44.9% (35) of the participants. Sixty-nine (54) respondents indicated that patient education was an essential part of therapeutic process but only 30.8% (24) instruct the patients regarding a wrist splint program. Regarding modalities, ice therapy was the technique used by 44% (35) respondents. Seventy-six percent of the respondents (59) used neural mobilization and 85% (66) prescribed home exercises as part of their rehabilitation program (Table 1).

Table 1: Questions (n=15; results are expressed as percentage of total answers per item).

	Question	Participants	
		Reply	[n (%)]
General Information			
1.	Where does your clinical practice usually take place?	Private practice	42, (54%)
2.	Years of experience	2-5 years	21, (27%)
3.	How many patients after carpal tunnel release do you treat in a month?	<10	59, (76%)
4.	Country	Spain	24, (31%)
5.	Profession	Physical Therapist	48, (62%)
Intervention Techniques			
6.	Regarding intervention techniques immediately post operatory: Indicate the different techniques you used in the first two weeks post- op	Sensory reeducation exercises	35, (45%)
7.	Intervention techniques used after two weeks post operatory: Indicate the different techniques you used after two weeks post-op.	Patient education	54, (69%)

8.	Does your intervention plan include an orthosis weaning program after carpal tunnel syndrome release?	I use an splint weaning program	24, (31%)
9.	Please, if your intervention plan does include an orthosis wearing program and Indicate your use of orthoses (please check all that apply):	I use both custom and pre-fabricated orthoses	18, (23%)
10.	Indicate your typical instruction for the wearing frequency and duration of the orthosis.	Only night	20, (26%)
11.	In case your intervention plan includes an orthosis wearing program, what joints are included in the orthosis?	Only wrist joint	23, (30%)
12.	Indicate which of the following physical modalities are used in the postoperative period of carpal tunnel syndrome. (Please check all that apply):	Ice therapy	35, (45%)
13.	In strengthening intervention after carpal tunnel release, Which muscles do you strengthen? Please indicate all that apply.	Wrist flexors	43, (55%)
14.	In your use of Joint Mobilization techniques, please indicate where and what grades of mobilization you use.	Neural mobilization	59, (76%)
15.	For the intervention after carpal tunnel release, I implement patient education in these areas:	Home exercise	66, (85%)

DISCUSSION

The purpose of this study was to assess the current attitudes and opinions around the globe regarding therapeutic interventions following CTR.

Sawan et al. [12], compared continuous ultrasound in conjunction with nerve and tendon gliding exercises versus laser therapy plus nerve and tendon gliding exercises versus nerve and tendon gliding exercises alone. No significant differences were describe between the ultrasound (US) and exercise groups and between the laser therapy and exercise groups. Lack of participant blinding and the use of different techniques in the same group, prevents us from knowing the effect of each of the techniques used as a unique treatment. In our survey, US was applied by 26% of the responders while 76% reported performing neural mobilization gliding exercises.

Alves et al. [13] conducted a quasi-randomized trial to know the effects of low-level laser therapy after CTR. Outcomes assessed in this study were: palmar pain, pillar pain, paresthesia, nighttime pain, pain or discomfort at the site of the scar and Tinel test, as well as time taken to return to activities of daily living or to work. The authors of the study concluded that the patients who received low-level laser therapy after surgical re-

lease of the flexor retinaculum in the wrist benefited from the treatment and obtained better functional results than those in the control group. However there were no statistically significant differences in CTS symptoms with low-level laser therapy versus placebo and no differences between groups in the return to work outcome at three months post-surgery. In our current practice survey, only 10% of occupational therapists and physical therapists used laser therapy as part of their treatment after CTR.

Others studies such as Gordon et al. [14] and Li et al. [15] attempted to demonstrate the effectiveness of electrical stimulation versus control or versus decimeter wave therapy versus a control group. Although both studies concluded that there are benefits in the use of electrostimulation (TENS) in post-carpal tunnel surgery rehabilitation, the measuring instruments used by the researchers did not provide suitable to validate the results. Electrostimulation was report by 18% of responders in our survey.

Regarding the choice of types of immobilization after CT surgery, Bury et al. [16] found no beneficial effect from postoperative splinting after open carpal tunnel release when compared to a bulky dressing alone. Instead, Bhatia et al. [17] performed a prospective randomized single blind trial with 102 patients in order to see if a plaster slab could reduce postoperative pain using it at the first 48h after surgery. There was no statistically significant difference between the two groups in postoperative pain scores in both studies. Other studies compared the effect of immobilization of the wrist following CTR with early mobilization. Cook et al. [18] with 50 participants compared exercises versus splint during the first 2 weeks after surgery. They reported that the splinted group had significant delays in return to activity daily life ADL and in recovery of grip and key pinch strength. In the first month after surgery, the splinted group reported more pain and scar tenderness compared with early mobilization group. Other studies that assessed the effects of early mobilization after CTR concluded that there were no differences between groups [19]. But the lack of an appropriate randomization and the longtime of immobilization (four weeks), should make us take into consideration the results with caution. Martins et al. [20], conducted a prospective study in order to see the effects of wrist immobilization after open carpal tunnel release with 52 participants. They found no significant difference between the two groups for discrimination test, function or pain intensity. No measurements as grip or pinch strength were taken in spite of the fact that some studies reported grip strength decreased by 19–25% when the wrist was splinted 21. Other research conducted by Cebesoy et al. [22], disagreed with the studies mentioned above and concluded that there are no benefits

for post-surgery immobilization and that used of splint is more expensive than a bulky dressing. In addition, Cebesoy et al. [22] reported that 80% of participants in the splinted group experienced discomfort compared to no discomfort reported in the mobilization group, which was found to be a statistically significant difference. However, the study did not provide specific data on the design of the splint or materials used in the study. In our survey, only 31% of responders used a splint-weaning program. The respondents reported immobilizing only wrist joint (30%) and prescribing the device to be used at night (25.6%).

Regarding the use of ice therapy, we identified one randomized trial that compared effects of controlled cold therapy (CCT) versus ice therapy commenced immediately post-surgery and continued for three days. Hochberg et al. [23] evaluated and compared the effects of CCT and conventional ice therapy on pain, edema, and narcotic use. The results showed that CCT is more effective than conventional ice therapy in providing efficient pain blockage and reduction of edema in postoperative management of carpal tunnel surgery. However neither the participants nor researcher were blinded during the experiment, which could influence the results of the study. Ice therapy is used by 45% of occupational therapists and physical therapists who participated in this research survey.

CONCLUSION

Despite the diminution of symptoms after carpal tunnel surgery, there is no consensus regarding clinical practice, techniques and intervention used by therapists worldwide after CTR. Our study identified the variability in the management regarding the interventions employed after CTR in 21 different countries. This variability may be due to the limited detail provided by many of the research studies or because there is a lack of studies that tested the effect of a single technique without influence from the other, making difficult to interpret which technique or practice is the best one for the recovery of strength, sensibility, or return to work after the carpal tunnel release. Additional studies with larger samples and the power to detect statistically significant differences between groups are needed to determine the effects of interventions in rehabilitation programs.

LIMITATIONS OF THE STUDY

Small sample size limits the generalizability of our findings. However, this is the first survey to attempt to determine global practice patterns of occupational and physical therapists following carpal tunnel release. This survey should be repeated to document further developments and even extended to a large population in collaboration with occupational therapies and physical therapies associations to compare these results

in more countries and to discover potential for future collaboration and elaboration of international clinical practice guides.

RESEARCH ETHICS

Committee Ethical approval this study.

CONFLICT OF INTEREST

None. The authors disclose any financial and personal relationships with other people or organizations that could inappropriately influence this work.

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