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Patient-reported outcomes after open carpal tunnel release using a standard protocol with 1 hand therapy visit

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ABSTRACT

Study Design: Retrospective case series.
Introduction: Open carpal tunnel release (OCTR) is a common treatment for carpal tunnel syndrome, but there is no consensus on the number of hand therapy visits needed to achieve optimal patient outcomes.
Purpose of the Study: The purpose is to examine changes in patient-reported symptoms and function over a 12-week period after OCTR with 1 postoperative hand therapy visit.
Methods: Eligible subjects were consecutive patients treated with a standard OCTR protocol by a fellowship trained hand surgeon that included 1 hand therapy visit at 10-14 days postoperatively. Patients were excluded from participation if they had additional surgery at the time of OCTR, had another upper extremity diagnosis that required therapeutic intervention, or received more or less than 1 visit of hand therapy. Responses on the Boston Carpal Tunnel Questionnaire (BCTQ) were collected at preoperative and 3 postoperative time points: at the hand therapy visit, 6 weeks, and 12 weeks. Change over time in the BCTQ Symptom Severity Scale and Functional Status Scale was assessed.
Results: A total of 134 patients who were treated with the standard protocol had a complete BCTQ data set. Both BCTQ scales showed significant improvement over time. The Symptom Severity Scale showed significant improvement by the hand therapy visit at 10-14 days postoperatively, whereas significant improvement on the Functional Status Scale did not occur until 6 weeks postoperatively. The magnitude of change from preoperative to 12 weeks postoperative was 1.51 points on the Symptom Severity Scale and 0.91 points on the Functional Status Scale. Complication rates were low with an incidence of 13% for pillar pain and palm pain combined.
Conclusions: Patient-reported symptoms and function improved significantly up to 12 weeks after OCTR. Moreover, there was a low incidence of pillar and palm pain. In a retrospective review of patients with a favorable prognosis based on having no need for extra surgical procedures or additional therapy visits, one therapy visit associated with improvements in symptoms and function, a low incidence of pillar/palm pain and favorable 12-weeks outcomes. There appears to be a subset of less complicated patients for whom one visit can allow for favorable outcomes.
Level of Evidence: 2B.

Introduction

Carpal tunnel syndrome (CTS) is the most common form of nerve compression in the United States with an incidence of 1-3 cases per 1000 individuals per year.[1] If nonsurgical treatments fail to provide relief, open carpal tunnel release (OCTR) is an effective surgical treatment for symptom resolution, regardless of patient age or the presence of medical comorbidities.[2-7] A literature review suggests that 70%-90% of patients have good-to-excellent long-term outcomes after OCTR.[4] Alternative surgical procedures to release the transverse carpal ligament have been reported (eg, endoscopic and mini open), but there is no strong evidence that these alternatives offer better symptom improvement over standard OCTR.[8,9] Only a small number of OCTR studies have used patient-reported outcome measures to monitor improvements in symptoms and function, and even fewer have focused on the early postsurgical period.[10-13] Therefore, little is known about the trajectory of patient-reported improvements in symptoms and function in early time points after OCTR surgery.

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The use of hand therapy in OCTR postoperative management is not standardized, and the optimal implementation of hand therapy is unclear.[2,14] A recent online survey of members of the American Society of Surgeons of the Hand reveals that only 12% of surgeons routinely prescribe hand therapy after carpal tunnel surgery.[15] One OCTR study identified early and more frequent hand therapy as an important factor in reducing the time interval between surgery and return to work; however, there was no control group for comparison.[16] Several OCTR studies have compared outcomes between a group that received hand therapy and a control group that did not receive hand therapy.[10,13,16,17] In these studies, hand therapy ranged from 6 to 10 postoperative visits over 4-6 weeks at an initial frequency of 3-5 visits per week. None of the studies found improved outcomes with the use of hand therapy, although a closer inspection of the studies reveals that the control group was given some form of education and home exercise program instruction (either preoperatively or postoperatively) as opposed to no treatment at all.[10,13,17] Thus, an explanation for the apparent lack of benefit from hand therapy in these studies could be that education and a home exercise program are critical elements to successful OCTR outcomes, not the number of hand therapy visits. In a clinical commentary on rehabilitation after carpal tunnel release, the importance of patient education and instruction in a home exercise program (edema control, range of motion, and scar mobilization techniques) was emphasized, and it was suggested that supervised hand therapy is not needed for the vast majority of patients after carpal tunnel release.[18] However, the commentary also stressed the importance of identifying early the patients at risk for a poor result so that they can be referred to a hand therapist for supervised therapy. One hand therapy visit after OCTR would be a mechanism to provide patients with structured education and instruction in a home exercise program as well as identify those who might require additional supervised therapy visits.

Because of the high prevalence of CTS and OCTR, identifying effective postoperative management is essential. OCTR postoperative management at our center routinely includes 1 visit of supervised hand therapy. Previous studies have not reported outcomes using this service delivery model. The purpose of this article is to examine changes in patient-reported symptoms and function over a 12-week period after OCTR with a standard protocol that includes a single postoperative hand therapy visit.

Methods

Study design

This is a retrospective and observational study of patients with OCTR. An electronic clinical database, established and managed by TRIA Orthopaedic Center in Bloomington, MN, was used to extract data including demographic variables and responses from the Boston Carpal Tunnel Questionnaire (BCTQ). Data were collected at 4 time points: (1) preoperative, (2) at the hand therapy visit (10-14 days postoperatively), (3) 6 weeks postoperatively, and (4) 12 weeks postoperatively. Preoperative data collection occurred on the day of surgery. The 10-14 days postoperative data collection occurred at the hand therapy visit, and the 6-week postoperative data collection occurred at routine follow-up with the physician or via electronic or postal mail. The final data collection, which occurred via electronic or postal mail, was chosen to be 12 weeks postoperatively as it was expected that most improvement would be achieved by this time point.

Subjects

Potential subjects were consecutive patients who received an OCTR by a fellowship-trained orthopedic hand surgeon at TRIA Orthopaedic Center in Bloomington, MN, between December 2008 and August 2011, without exclusion for medical comorbidities. Patients were excluded from participation if they had additional surgery at the time of OCTR, had another upper extremity diagnosis that required therapeutic intervention, or received more or less than 1 visit of hand therapy. Subjects in this study were a subset of patients reported in a previous study.[7] The electronic clinical database for this study was approved for use in research by the Institutional Review Board at Park Nicollet Health Services.

Surgical procedure

A standard OCTR surgery was performed under local anesthesia in an outpatient surgical procedure room by 1 of 5 hand surgeons. The area of planned incision was injected with a 1:1 mix of 2% plain lidocaine and 0.5% plain bupivacaine. A tourniquet was placed on the forearm. The hand was prepped and draped, and the correct site was identified. The tourniquet was elevated to 250-350 mm Hg, depending on the surgeon preference. A 2-cm incision was made longitudinally on the palm over the transverse carpal ligament in alignment with the radial border of the ring finger and did not cross the wrist crease. The transverse carpal ligament was divided. The tourniquet was deflated after an average of 5 minutes. The wound was irrigated, and the bleeding was cauterized. The wound was sutured with 4-0 nylon horizontal mattress stitches, and a soft dressing was placed. A rigid dressing or orthosis was not applied postoperatively as this has been found to hinder mobility and return to function.[19-21] Perioperative antibiotics were not routinely administered.

Postoperative protocol

On the day of surgery, patients received standard written and verbal instructions by the surgical nursing staff. Patients were instructed to elevate the hand to reduce edema and to leave the postoperative dressing in place for 4-5 days, then remove the dressing, and redress the incision with an adhesive bandage. Once the postoperative dressing was removed, patients could get the incision wet with hand washing and showering but were instructed not to submerge the incision until after suture removal. Patients were instructed to resume use of the hand for daily activities immediately postoperatively as tolerated without any formal restrictions.

Patients attended a single hand therapy visit at 1 of 2 outpatient hand therapy clinic locations that was targeted to occur between 10 and 14 days postoperatively and was in lieu of a visit with the surgeon. Therapy was provided by 1 of 26 therapists specialized in hand therapy (25 occupational therapists and 1 physical therapist; 16 of the 26 were credentialed as certified hand therapists and the remaining 10 practice hand therapy exclusively). The hand therapy protocol included an evaluation, suture removal, education, and instruction in a home program with a standard written handout provided. Because scar pain has been identified as the most common long-term complication after OCTR,[11] our treatment protocol included preventative scar management consistent with current evidence-based practice.[22] Patients were given verbal and written instruction in scar management techniques including scar mobilization massage (3 times per day for 3-5 minutes) and the use of a scar pad (Elasto-Gel cast and splint padding, Southwest Technologies, Inc., Kansas City, MO, USA) to be worn at least 8 hours in a 24-hour period (typically overnight) once the incision