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RESEARCH ARTICLE

Carpal Tunnel Syndrome and Trigger Finger. Sometimes Related

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Abstract:

Background:

Carpal tunnel syndrome and trigger finger are common hand problems. Each can be a cause of pain and disability. Treatment for each diagnosis can be nonoperative or, when nonoperative treatment has failed and when symptoms warrant, treatment can be surgical. Carpal tunnel syndrome and trigger finger can present independently of each other, or, in some cases, both can be present in the same hand.

Methods:

Data was collected using PearlDiver proprietary software (PearlDiver, Inc, Colorado Springs, CO). This is a national data set from the United States representing 157 million distinct patients over the period from January 2010 to October 2021. PearlDiver was queried for all patients who underwent carpal tunnel release (represented by CTP-64721 for open carpal tunnel releases and CTP-29848 for endoscopic releases) and trigger finger release (represented by CTP-26055) on the same day.

Results:

Our search identified the number of carpal tunnel releases and the number of carpal tunnel releases + trigger finger release (same day). Carpal tunnel release + trigger finger release represent 8.4% of the total number of carpal tunnel release procedures.

Conclusion:

Patients who present with carpal tunnel syndrome may be advised that they are at increased risk of developing trigger fingers.

Keywords: Carpal tunnel syndrome, Trigger finger, Flexor tendonitis, Cortisone, Nonoperative, NSAIDs.

Article History

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1. INTRODUCTION

Carpal tunnel syndrome is the most frequent compressive neuropathy in the upper extremity [1]. Trigger finger – stenosing flexor tendonitis – is another common hand problem [2]. Each can cause pain and disability.

Together, carpal tunnel syndrome and trigger finger are among the most common disorders treated by hand surgeons [3]. Initial treatment for each is often nonoperative and can include oral anti-inflammatory medication (NSAIDs), splinting, and cortisone injection. When nonoperative treatment fails to alleviate symptoms, treatment can be surgical.

The specific causes of carpal tunnel syndrome and trigger finger are unclear and may be multifactorial [2, 4]. It is not

clear whether having carpal tunnel syndrome or a trigger finger will make it more likely that the other problem will occur. Also, not clear is whether surgical treatment for one problem – carpal tunnel release or trigger finger release increases the likelihood of developing the other problem (carpal tunnel syndrome or trigger finger). Several studies have investigated the incidence of trigger fingers occurring after carpal tunnel release to assess whether carpal tunnel release surgery increases the likelihood of developing trigger finger [5 - 16]. The incidence of carpal tunnel syndrome following trigger finger release surgery has been evaluated as well [4, 17]. A few studies have looked at carpal tunnel syndrome and trigger finger occurring concomitantly [18 - 21]

We are interested in knowing how often the operations are performed simultaneously. This information may assist further analysis of the etiology of carpal tunnel syndrome and trigger finger.

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2. METHODS

Data was collected using PearlDiver proprietary software (PearlDiver, Inc, Colorado Springs, CO). This is a national data set from the United States representing 157 million distinct patients over the period from January 2010 to October 2021. The data is de-identified and not subject to review by an Institutional Review Board. The data includes all US states and territories. Commercial, Medicare Medicaid, government, and cash-payer types are included in the data set.

PearlDiver was queried for all patients who underwent carpal tunnel release (represented by CTP-64721 for open carpal tunnel releases and CTP-29848 for endoscopic releases) and trigger finger release (represented by CTP-26055) on the same day. No other limitations were imposed on the query.

3. RESULTS

Total carpal tunnel release = 1,349,674

Total carpal tunnel release + trigger finger release on same day = 112,859

Our search identified the number of carpal tunnel releases and the number of carpal tunnel releases + trigger finger releases (same day). Carpal tunnel release + trigger finger release represent 8.4% of the total number of carpal tunnel release procedures.

4. DISCUSSION

Carpal tunnel syndrome and trigger digits are often co-existent, and patients may seek treatment for both conditions simultaneously, leading to our finding that 8% of patients undergoing carpal tunnel release had simultaneous surgery for a trigger digit. Additionally, it is not uncommon for patients who have undergone carpal tunnel release to return at some point afterward, complaining of triggering of one or more digits, leading to various hypotheses suggesting a causal relationship between these two conditions. Patients may ask whether the trigger finger is caused by the earlier carpal tunnel release. Physicians who regularly perform carpal tunnel release

may note an association between carpal tunnel release and subsequent trigger finger or even suggest its occurrence should be part of the informed consent process. Many studies have examined the relationship between carpal tunnel syndrome and trigger digits, and perhaps due to the range of size and study design, there is an unsurprising lack of unanimity with regard to findings and conclusion.

Table 1, summarizing the most pertinent of these studies, appears below, followed by a narrative description of their salient points.

Yunoki *et al.* [15] reported on 39 patients who underwent 46 open carpal tunnel release procedures. After carpal tunnel release, trigger finger occurred in 9 hands of 8 patients. (19.6%). The mean interval between carpal tunnel release and onset of trigger finger was 5.3 ± 2.8 months. The authors noted that trigger digit after carpal tunnel release was “not rare” and that it was appropriate to inform patients that symptoms of trigger digit might appear or worsen after carpal tunnel release surgery, especially within 6 months.

Nosewicz *et al.* [12] performed a retrospective chart analysis of 967 carpal tunnel release procedures (open or endoscopic) in 694 patients. 64 trigger digits were seen post-operatively in 47 hands (4.9%). A majority of the trigger digits developed more than 6 months after undergoing carpal tunnel release. The occurrence of the trigger finger was unrelated to the surgical technique (open carpal tunnel release *vs* endoscopic carpal tunnel release). In a separate study, Harada *et al.* [18] also found no relationship between endoscopic carpal tunnel release *versus* open carpal tunnel release and the incidence of subsequent trigger fingers.

Raducha *et al.* [13] retrospectively reviewed 435 patients who underwent 556 carpal tunnel releases. 46 trigger fingers (6.8%) developed in the operative (ipsilateral) hand at an average of 228 days after surgery. The thumb was commonly involved. The authors reported 21 trigger fingers (2.7%) in the nonoperative (contralateral) hand. In this group, the ring finger was most affected. The authors describe the occurrence of trigger finger after carpal tunnel release as “an important possible outcome to discuss with patients.”

Table 1. A Summary of the following literature review, in order of appearance.

Author/Refs	Year	Number of Patients	Pertinent Findings
Yunoki <i>et al.</i> [15]	2019	39	Trigger finger in 19.6% of patients after carpal tunnel release
Nosewicz <i>et al.</i> [12]	2019	967	Trigger finger in 4.9% of patients after carpal tunnel release
Harada <i>et al.</i> [18]	2005	875	11% of carpal tunnel releases required a trigger finger procedure within 3 years
Raducha <i>et al.</i> [13]	2021	435	Trigger finger in 6.8% of patients after carpal tunnel release
Goshtasby <i>et al.</i> [6]	2010	792	Trigger finger in 6.3% of patients after carpal tunnel release
Shafee-Khanghah <i>et al.</i> [14]	2020	57	26.3% of trigger finger patients had previous carpal tunnel release
Ashmead <i>et al.</i> [5]	2020	229	Trigger finger in 13.5% of patients after carpal tunnel release
Lin <i>et al.</i> [11]	2017	483	Trigger finger in 8.5% of patients after carpal tunnel release
Lee <i>et al.</i> [9]	2022	6543	Trigger finger in 12.2% of patients after carpal tunnel release
Lin <i>et al.</i> [10]	2017	2605	3.63 times greater risk of trigger digits in patients with carpal tunnel
Zhang <i>et al.</i> [16]	2019	890	Carpal tunnel release did not predispose patients to trigger finger
Wessel <i>et al.</i> [4]	2013	300	16% of patients with trigger fingers had carpal tunnel syndrome

(Table 1) contd.....

Author/Refs	Year	Number of Patients	Pertinent Findings
Hsieh <i>et al.</i> [17]	2022	8232	Patients undergoing trigger finger procedures have a higher risk of carpal tunnel syndrome 1 year later.
Kumar and Chakrabarti [19]	2009	551	Of patients with trigger fingers, 43% also had carpal tunnel syndrome

Goshtasby *et al.* [6] retrospectively reviewed 792 carpal tunnel release procedures. The purpose of the review was to assess for risk factors for a new trigger finger after carpal tunnel release. They found a new onset of trigger finger incidence of 6.3%. Endoscopic carpal tunnel release was an independent risk factor for the trigger finger. This contrasts with Nosewicz *et al.* [12] and Harada *et al.* [18], who found endoscopic carpal tunnel release was not a risk factor.

Shafee-Khanghah *et al.* [14] retrospectively reviewed 57 consecutive patients who underwent trigger finger release surgery and found that 15 (26.3%) had undergone prior carpal tunnel release surgery approximately 6 months before trigger finger release. The ring finger was involved in 28 patients (49%).

Ashmead *et al.* [5] performed a retrospective review of patients who underwent open carpal tunnel release by the same surgeon. The primary outcome measure was whether a trigger digit developed after open carpal tunnel release in the operated hand. 315 open carpal tunnel releases were performed in 229 patients (86 patients underwent staged bilateral carpal tunnel release). 31 patients (13.5%) developed trigger digits, with the thumb being commonly involved. Handedness, gender, history of diabetes, and age were investigated and found not to be a risk factor for trigger finger following carpal tunnel release. The authors felt that it was “likely” that the trigger digit following carpal tunnel release was due to an “innate tendency” toward trigger digit that was “possibly” exacerbated by carpal tunnel release surgery. The authors speculated on the role of post-operative edema following carpal tunnel release as a risk factor.

Lin *et al.* [11] performed a systemic review of the literature over a 50-year period and identified 9 studies that reported the incidence of trigger digits after carpal tunnel release. Out of 5654 carpal tunnel release surgeries, 483 patients (8.5%) developed trigger digits after carpal tunnel release (reported range 5.2% to 31.7%). Trigger digits occurred approximately 6 months after carpal tunnel release. The authors described the incidence of trigger digits after carpal tunnel release surgery as “not negligible” and recommended that this possibility be “suitably” addressed with patients.

Lee *et al.* [9] retrospectively identified patients with carpal tunnel syndrome. They compared a group who underwent carpal tunnel release with a group treated conservatively (6543 patients in each group), with minimum follow-up greater than 5 years. Those patients who underwent carpal tunnel release had a higher rate of trigger finger (12.2%) and a higher rate of trigger finger release surgery (4.7%) compared with those patients diagnosed with carpal tunnel syndrome who did not undergo carpal tunnel release (6.2% and 1.2% respectively). Trigger finger occurred most frequently during the first post-operative year.

In a retrospective cohort study from Taiwan using a

national health insurance database, patients who underwent carpal tunnel release surgery were compared with patients diagnosed with carpal tunnel syndrome who did not undergo carpal tunnel release [10]. The mean follow-up in each group was greater than 5 years. The authors identified the overall risk of a trigger digit which was 3.63 times greater in the carpal tunnel release cohort. The incidence of trigger digit following carpal tunnel release was highest during the first 6 months after surgery but remained higher during follow-up to 8 years. As in other studies the authors suggested that patients be informed of possibly developing a trigger digit after carpal tunnel release.

Zhang *et al.* [16] reached a different conclusion from those studies reported above. They noted, as have other authors that the association between carpal tunnel syndrome and trigger finger is not well understood. Following an analysis of 906 cases of carpal tunnel release in 890 patients, the authors stated that carpal tunnel syndrome and trigger finger “are common pathologies with a predisposition for presenting in the same hand,” but none-the-less concluded that carpal tunnel release did not predispose patients to development of trigger finger.

The research reviewed above has examined the incidence of trigger digits following carpal tunnel release to assess the relationship between carpal tunnel release and subsequent trigger digits. Other authors have looked at the two diagnoses differently. That is, looking into patients who have been diagnosed with trigger digits to see whether these individuals are more likely to have carpal tunnel syndrome and whether treatment for trigger finger increases the chance of developing carpal tunnel syndrome.

For example, Wessel [4] conducted a study to determine the incidence of carpal tunnel syndrome in patients treated for single *versus* multiple trigger digits. In a retrospective review of 300 patients treated for trigger digit (injection or surgery), 16% of patients with a single trigger digit had concomitant carpal tunnel syndrome symptoms, and 41% of patients with multiple trigger digits had concomitant carpal tunnel syndrome symptoms. The authors concluded that multiple trigger digits are a risk factor for carpal tunnel syndrome.

Hsieh *et al.* [17] conducted a retrospective cohort study of patients diagnosed with trigger digits, comparing patients who underwent trigger digit release with those who did not undergo surgery. The primary outcome was carpal tunnel release. They reported that patients undergoing trigger finger release may have a higher incidence of carpal tunnel release one year later. The results, according to the authors, “support a model of shared pathophysiology” between carpal tunnel syndrome and trigger finger. Kumar and Chakrabarti [19] conducted a prospective study evaluating the prevalence of carpal tunnel syndrome in patients presenting with trigger digits. 43% of 211 patients with trigger digits also had carpal tunnel syndrome. The authors found “support” for an association between carpal tunnel syndrome and trigger digits.

Carpal tunnel syndrome and trigger finger concurrently in the same hand are common [21]. Patients who are diagnosed as having both carpal tunnel syndrome and trigger finger may merit treatment of both if symptoms warrant, and treatment can include simultaneous carpal tunnel release and trigger finger release. The purpose of our study was to retrospectively review a large population to assess the frequency of carpal tunnel release and trigger finger release compared with carpal tunnel release alone. We found that 8.4% of patients who underwent carpal tunnel release also underwent trigger finger release. This is comparable to the result of Harada *et al.* [18], who reviewed 875 hands that underwent carpal tunnel release and reported trigger finger release at the same time as carpal tunnel release in 49 hands (5.6%).

While an association between the two diagnoses has been noted, the causes of carpal tunnel syndrome and trigger finger are likely “multifactorial” [4]. Hence the common label of “idiopathic.” Physicians should be aware that the two problems can co-exist and should, when the diagnosis of one is made, look carefully for the other. Treatment can include simultaneous carpal tunnel release and trigger finger release. Patients who present with carpal tunnel syndrome may be advised that they are at increased risk of developing trigger fingers. The reverse is likely to be true as well.

CONCLUSION

Patients who present with carpal tunnel syndrome are at increased risk of developing trigger fingers. The treating physician should be alert to this possibility and patients should be so advised.

LIST OF ABBREVIATIONS

(NSAIDs) = Nonsteroidal Anti-inflammatory Drug

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No animals/humans were used in this research.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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