Hand Corticosteroid Injections in Patients on “Blood Thinners”

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Ajith Malige¹ and Kristofer S. Matullo¹

Abstract

Background: Our study aims to identify any influence that anticoagulation and antiplatelet (“blood thinner”) medications have on hand and wrist corticosteroid injection complication rates. **Methods:** This retrospective chart review looked at patients between the ages of 18 and 89 years who received corticosteroid injections in the hand or wrist between 2013 and 2017, noting anticoagulation and antiplatelet use, demographics, injection placement, and surgical intervention. **Results:** Only 152 (20.9%) of the 726 diagnoses that were treated needed eventual surgical intervention. There were 12 overall reported complications after 1473 injections (0.8%). There were 6 complications after 433 injections (1.6%) placed in patients on blood thinners and 6 complications after 1040 injections (0.6%) placed in patients not on blood thinners. **Conclusions:** With the complication rate of corticosteroid injections being so low, even in patients taking “blood thinners,” the fear of adverse reactions should not preclude a physician from using this treatment modality to prevent surgical intervention.

Keywords: pain, diagnosis, corticosteroid, anticoagulation, injection, hand therapy, specialty

Introduction

The painful effects of inflammation in the tendons and joints of the hand results in many patients seeking treatment to abate the pain and restore function. In an attempt to avoid surgical intervention, patients and surgeons alike turn to corticosteroid injections under various hand conditions, including carpal tunnel syndrome, stenosing tenosynovitis, osteoarthritis, and de Quervain tenosynovitis.^{1–3} By curbing the inflammatory processes that can plague the many tendons and joints in the hand, accurately placed corticosteroid injections can effectively decrease the pain and swelling that affects patients, allowing surgeons to use this method of treatment prior to making the decision to surgically intervene.^{4,5} Physicians must still be wary of the multiple side effects associated with the use of corticosteroids, including tendon rupture, irreversible subcutaneous and dermal atrophy and skin depigmentation, infection, and increased hyperglycemic episodes in patients with diabetes.^{6,7} Although the literature does include reports of these complications after injections, most studies conclude the safety and efficacy of corticosteroid injections for various conditions.^{8–12} However, these same recommendations have not been made for injections placed in the hand and wrist.

Our study aims to identify any influence that anticoagulation and antiplatelet (“blood thinner”) medications may have on corticosteroid injection complication rates placed in the hand and wrist. Specifically, we look to document the

difference in rates of hematoma and other complications after these injections between patients medicated with blood thinners and controls.

Materials and Methods

This retrospective chart review was conducted at a suburban orthopedic outpatient clinic after obtaining approval from our institutional review board. Patients between the ages of 18 and 89 years who received corticosteroid injections in the hand or wrist as anti-inflammatory therapy (searched using *Current Procedural Terminology* codes 20526, 20550, and 20600) between 2013 and 2017 were included in this study. Only patients who received injections for a diagnosis without previously having had surgery for that pathology were included. Patients were excluded if they had previously had surgery at that site, did not follow up after the injection, or were younger than 18 years of age. When deemed appropriate, patients were injected with a suspension consisting of 6 mg of betamethasone combined with 1 mL of 1% lidocaine without epinephrine by a fellow-

¹St. Luke's University Hospital, Bethlehem, PA, USA

Corresponding Author:

Kristofer S. Matullo, Department of Orthopaedic Surgery, St. Luke's University Hospital, 801 Ostrum Street, Bethlehem, PA 18015, USA.
Email: kristofer.matullo@sluhn.org

Table 1. Demographic Information and Diagnosis Frequency in Our Sample Population.

	Diagnosis					
	Trigger finger (%)	Osteoarthritis (%)	DQTS (%)	CTS (%)	Other (%)	Total (%)
Sex						
Female	170 (23.4)	169 (23.3)	64 (8.8)	48 (6.1)	29 (4.0)	480 (66.1)
Male	108 (14.9)	87 (12.0)	18 (2.5)	18 (2.5)	15 (2.1)	246 (33.9)
Age, y						
18-39	9 (1.2)	4 (0.6)	10 (1.4)	11 (1.5)	9 (1.2)	43 (5.9)
40-59	118 (16.3)	109 (15.0)	35 (4.8)	39 (5.4)	18 (2.5)	319 (43.9)
60-79	126 (17.4)	127 (17.5)	33 (4.5)	11 (1.5)	15 (2.1)	312 (43.0)
80+	25 (3.4)	16 (2.2)	4 (0.6)	5 (0.7)	2 (0.3)	52 (7.2)
Total diagnoses	278 (38.3)	256 (35.3)	82 (11.3)	66 (9.1)	44 (6.1)	726 (100)

Note. DQTS = de Quervain tenosynovitis; CTS = carpal tunnel syndrome.

ship-trained orthopedic hand surgery attending physician. All included patients were divided into 2 groups: patients on blood thinners and patients not on blood thinners. Charts were reviewed to determine demographic characteristics (sex and age), diagnoses, number of injections, complications as subjectively reported by patients or objectively recorded by the same attending physician, and eventual related surgeries in our patient population. Patient came back for at least one follow-up appointment, usually within 1 to 2 months, after their injection. All complications that were documented in the procedure note, the subsequent outpatient office visit, or documented phone calls made by patients to the office were recorded. Routine calls following up with the patient after this appointment were not made.

Data was cataloged using a password-protected electronic spreadsheet. The complication rates of the 2 groups were analyzed using simple descriptive statistics and χ^2 statistical tests as appropriate to determine associations. By dividing each group (patients on "blood thinners" and patients not on "blood thinners") into those who experienced complications and those who did not, we can determine raw percentages as well as significant differences between the groups. The use of the described 2×2 tables will establish increased safety in a single group or equality among all groups. For all analyses, $P \leq .05$ denotes statistical significance with no adjustment for multiple comparisons.

Results

A total of 502 patient charts were reviewed and included in this study. Among these 502 charts, there were 726 sites of involvement and 1473 injections placed, with an average of 2.03 injections per site. Of the 726 different sites treated, 152 patient sites (20.9%) needed eventual surgical intervention after failed conservative treatment, including corticosteroid injection, with 574 (79.1%) avoiding operative treatment. Our sample population predominantly consisted

of female ($n = 480$; 66.1%) patients between the ages of 40 and 59 years ($n = 319$; 43.9%) and 60 and 79 years ($n = 312$; 43.0%). The most common diagnoses in our patient population included trigger finger ($n = 278$ of 726; 38.3%) and osteoarthritis ($n = 256$ of 726; 35.3%) (Table 1). Of the 726 different diagnoses that injections were placed for, 215 (29.6%) were in patients on blood thinners, leaving 511 (70.4%) not on any such medications. Of these 215, 30 (4.1%) conditions were diagnosed in patients on anticoagulation medications, with the most common anticoagulant being warfarin ($n = 22$; 3.0%). One hundred seventy-five (24.1%) diagnoses were in patients taking antiplatelet medications, with the most common being regularly scheduled aspirin ($n = 135$; 18.6%), and 10 (1.4%) diagnoses were in patients on both anticoagulation and antiplatelet medications. Of the patients on blood thinners, most were on medications for coronary artery disease ($n = 48$; 6.6%) and atrial fibrillation ($n = 27$; 3.7%).

Our study yielded a total of 12 complications for the 1473 injections placed (0.8%). Seven of these complications were experienced when injections were placed for trigger finger, and 3 were for osteoarthritis (Table 2). Of the 12 complications, 7 complaints of increased pain at the injection site (0.5%), 4 complaints of swelling and erythema (0.3%), and 3 complaints consistent with contact dermatitis were noted (0.2%). There were no instances of hematoma or infection seen after the procedure. Of the 433 injections placed in patients on blood thinners, 6 complications (1.4%) were documented after the procedure. This compares with 6 complications (0.6%) after 1040 injections placed in patients not on blood thinners (Figure 1). When the 2 complication rates among groups were compared using χ^2 testing, no statistical difference was noted between the 2 groups ($P = .12$).

A post hoc analysis of patients on blood thinners centered around splitting the cohort into patients on anticoagulant medications, patients on antiplatelet medications, and patients on both. Of the 50 injections placed in patients on

Table 2. Complication Rate After Corticosteroid Injections in the Hand by Medication Type and Diagnosis.

	Diagnosis (no. of complications, total no. of injections)					Total (%)
	Trigger finger (%)	Osteoarthritis (%)	DQTS (%)	CTS (%)	Other (%)	
Anticoagulant	1, 12 (8.3)	1, 31 (3.2)	0, 2 (0.0)	0, 1 (0.0)	0, 4 (0.0)	2, 50 (4.0)
Antiplatelet	1, 92 (1.1)	1, 216 (0.5)	1, 31 (3.2)	0, 19 (0.0)	1, 13 (7.7)	4, 371 (1.1)
Both	0, 5 (0.0)	0, 6 (0.0)	0, 0 (0.0)	0, 1 (0.0)	0, 0 (0.0)	0, 12 (0.0)
Neither	5, 269 (1.9)	1, 581 (0.2)	0, 86 (0.0)	0, 58 (0.0)	0, 46 (0.0)	6, 1040 (0.6)
Total	7, 378 (1.9)	3, 834 (0.4)	1, 119 (0.8)	0, 79 (0.0)	1, 63 (1.6)	12, 1473 (0.8)

Note. DQTS = de Quervain tenosynovitis; CTS = carpal tunnel syndrome.

Figure 1. Total complication rate after corticosteroid injections in the hand. Complication rates after injections in patients on anticoagulation medications, patients on antiplatelet medications, patients on both, and patients on neither.

anticoagulants, 2 (4.0%) complications were noted. Both adverse reactions were in patients currently taking warfarin ($n = 2$ of 22; 9.1%). Of the 371 injections placed in patients on antiplatelet medications, 4 (1.1%) complications were noted. All 4 of these patients were on aspirin ($n = 4$ of 135; 3.0%). Finally, of the 12 injections given to patients on both types of medications, no complication was noted (Figure 1). However, there was no statistical difference in complication rates when these 3 groups were compared with each other and with the group of patients not on “blood thinners” ($P = .06$) (Table 2).

Discussion

The benefit of corticosteroid injections to decrease inflammatory processes and reduce pain at their selected target

has been well documented in the literature.⁴ When executed correctly, this intervention can provide symptomatic relief, delay surgery, or even avoid surgery completely.^{13,14} It is up to each physician to not only take the time to place the injection accurately but also consider complications that may occur after corticosteroid injections in the hand and wrist.¹⁵

This retrospective chart review looks to document the rate of complications in hand and wrist corticosteroid injection and to compare the rates between patients on blood thinners and patients not on blood thinners. Our low overall complication rate of 0.8% confirms the equally low complication rates already published and the current opinion that corticosteroid injections are safe interventions in the hand and wrist.¹⁰ Although the rate of complications was more than doubled in the blood thinner cohort

(1.4%) versus the control (0.6%), the lack of significant difference between the 2 groups points to the safety of the injection in all patients. Although our post hoc analysis yielded rates as high as 4.0% in the anticoagulation medication group, the lack of significant difference between these groups as well further points to the safety of these injections. Furthermore, the expected complication of hematoma was not present in any of our patients, a finding that echoes the low rate of hematomas found after injection placement in the literature.^{12,16-18} The authors also believe that the 9% rate of complications after injections placed in patients on warfarin and the 3% rate after injections placed in patients taking aspirin are products of the small sample size in our population rather than any increased risk these specific medications may confer. Although our results did show a higher rate of complications after injections placed in patients with diagnosed trigger finger (1.9%) compared with the other diagnoses, these rates were reported only for observational statistics rather than statistical analysis secondary to the primary purpose of this study.

Given the low rate of overall complications between groups, the authors believe that corticosteroid injections are safe and prudent conservative treatment options in all patients, regardless of whether they take blood thinners or not. Although our study did not record international normalized ratio (INR) levels in its medicated patients, previous studies do recommend an INR <3 in patients receiving corticosteroid injections.¹⁶⁻¹⁸ Under the assumption that patients are properly medicated and managed, this intervention should continue to be the focal point of conservative treatment, sparing almost 80% of our patients the need for surgical intervention, a rate that rivals the 74% to 88% noted in multiple studies.^{12,19} When combined with accurate diagnosis, imaging, and other appropriate conservative measures, corticosteroid injections can be a safe and effective conservative treatment for clinically appropriate diagnoses.

Our study has some limitations, mostly due to its retrospective nature. Any inaccurate charting or lack of patient reporting of adverse reactions on blood thinner medications could skew our data. Any patient who decided to visit another hand surgeon for complications after an injection was placed at our clinic was not accounted for. The authors attempted to minimize this omission by excluding patients who did not follow up after injection. Our study also only included regularly scheduled blood thinners, leaving out nonsteroidal anti-inflammatory drugs and herbal supplements that may exhibit antiplatelet properties when taken on an as-needed basis. Concomitant comorbidities in our patients that could increase complication rates, such as diabetes or nutritional deficiencies, were not accounted for. Finally, our chart review only studies a suburban population. Future studies could focus on a more encompassing

patient population, prospectively studying patients from multiple settings and backgrounds to represent a true orthopedic population.

Authors' Note

This abstract has been presented as Poster in the American Association of Hand Surgery 2018 Annual Meeting.

Ethical Approval

Institutional review board (IRB) approval was obtained from the St. Luke's University Health Network IRB Committee.

Statement of Human and Animal Rights

This article does not contain any studies with human or animal subjects.

Statement of Informed Consent

This was a retrospective chart review with no identifying information included.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: KSM is a consultant for DePuy Synthes and Integra Life Sciences.

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