

Research Article

The efficacy of local corticosteroid injection in the treatment of trigger finger

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ABSTRACT

Background and Objectives: Trigger finger is a condition that causes triggering, snapping or locking on flexion of the involved digit. Treatment modalities are conservative (Non-steroidal anti-inflammatory drugs, splints or corticosteroid injections) or operative (percutaneous or open release of A1 pulley- the first annular pulley of the fibro-osseous sheath of the fingers situated at the level of the metacarpophalangeal joint). The aim of this study is to evaluate the efficacy of corticosteroid injection for trigger finger in adults.

Material and Methods: Fifty patients with 54 trigger digits were treated by one or two injections of methylprednisolone acetate with 1% lignocaine. Patients were followed-up for a period of 6 months.

Results: Symptoms and signs resolved in 79.63% of the injected digits. Local adverse reactions to steroid injection- pain at the injection site and steroid flare were self-limiting. There was no tendon rupture or post-injection infection.

Conclusion: The study concludes that steroid injection is an effective first line treatment for trigger finger in most patients.

Key words: Injection, Steroid, Trigger finger

INTRODUCTION

Trigger finger is a condition that occurs when the gliding movement of the tendon is blocked by the osteofibrous canal of the A1 pulley, preventing the tendon from naturally extending and returning to its initial position. Notta (1988) first described it as a condition caused by changes to the flexor tendon and its sheath [1]. There is a mismatch between the

size of the tendon sheath and the tendon which passes through it [2,3,4].

It commonly presents in middle age women with pain, swelling and limitation of movement. It frequently involves the thumb and ring fingers of the dominant hand [5]. The disease can be primary or may occur secondary to rheumatoid arthritis, diabetes mellitus, gout, de Quervain's disease or direct

tendon trauma [6, 7, 8]. Quinell [9] graded triggering of the digits from I to IV (Table 1).

Table 1: Quinell grading of trigger finger

Grade	Symptoms
I	No triggering, but uneven finger movements
II	Actively correctable triggering
III	Triggering usually correctable by the other hand
IV	Locked digit

Different treatment modalities are available for managing trigger finger. Splinting, corticosteroid injections and percutaneous or open surgical division of A1 pulley are all established means of treatment. Operative therapy is effective (60-97% cure rate) but associated with higher cost, longer absence from work and the possibility of surgical complications [10]. In various studies, a single injection of corticosteroid relieved symptoms in 47-87% of patients with trigger finger [6,11,12,13,14].

Trigger finger is a common complaint with which patients visit hospital and different methods of treatment are available. Corticosteroids act as an anti-inflammatory agent reducing the swelling at the A1 pulley which corrects the mismatch between the flexor tendon and the sheath. Though surgery has a greater cure rate, corticosteroids are still used as the initial treatment modality. The purpose of this prospective study is to evaluate the results of corticosteroid injection for the treatment of trigger finger.

MATERIAL AND METHODS

This prospective study was conducted at Chitwan Medical College Teaching Hospital and Janaki Medical College Teaching Hospital from January 2015 to December 2015. Fifty

patients (25 from each institute) with 54 trigger digits were enrolled. A clinical diagnosis of trigger finger was defined as a history of triggering or locking of finger with or without pain and tenderness or swelling at the A1 pulley. Exclusion criteria were age <18 years, eczema at the site of injection, previous tendon laceration and prior treatment in the last 6 months with steroid injection.

Approval for the study was granted from the Institutional Review Committee of CMC and JMC. informed consent was taken from all the participants.

The injection method was as follows: the palmer skin was cleaned with povidone-iodine solution followed by alcohol wipe and a 25-gauge needle was introduced into the tendon sheath at the level of the A1 pulley. This was confirmed by detecting movements of the needle on flexing and extending the finger. The needle was then slightly withdrawn until it no longer moved with the tendon. At this stage 0.5 ml (20 mg) of methylprednisolone acetate with 0.5 ml of 1% lignocaine was injected.

Patients were asked to keep a diary of pain experienced, analgesic consumption and episodes of triggering of digits. Following outcome measurements were done: Direct treatment response (consensus between doctor and patient): 0 = no response; 1 = partial response, but not satisfactory, warranting further treatment; 2 = partial response, satisfactory, not warranting further treatment; 3 = complete resolution of symptoms and signs. Perceived improvement (by patient): -2 = much worse, -1 = worse, 0 = not better/ not worse, +1 = better, +2 = much better. Pain and discomfort in the palm of the hand using a numerical rating score: 0 = no pain, 10 = severe pain.

Follow-up measurements were performed at 2 weeks and 1, 3 and 6 months. Patients were graded as 'success' (either complete resolution of symptoms or sufficiently improved that further treatment was not necessary) or 'failure' (persisting clicking or locking requiring retreatment). Those with some improvement were re-injected with 20mg methylprednisolone acetate.

Statistical data analysis was done using the SPSS (Statistical Package for Social Sciences) version 20.0. Analysis was done using frequencies, descriptive option for mean and standard deviation and paired sample t-test. Values of $p < 0.05$ were taken to indicate significance with confidence interval of 95%.

RESULTS

There were 20 men and 30 women in our study with age ranging from 22-70 years. The baseline characteristics of the patients are shown in Table 2. According to Quinell grading 40 digits had grade II and 14 had grade III triggering.

Table 2: Baseline characteristics of patients with trigger finger

Variable	
Male/ Female, n	20/ 30
Mean (SD) age, years	40.14 (13.87)
Mean (SD) duration of symptoms, weeks	9.66 (4.02)
Affected hand (right/ left/ bilateral)	25/ 22/ 3
Dexterity (right/ left)	46/ 4
Affected finger, n	
Thumb	24
Index	3
Middle	10
Ring	16
Little	1
Median visual analog pain scale (P ₂₅ , P ₇₅)	5 (4, 6)

At the 2 week follow-up examination, 45 of the 54 trigger digits (83.33%) were asymptomatic, 3 (5.56%) had no improvement and 6 (11.11%) had some improvement. Patient perceived improvement was 90.74% (49 out of 54) and the median severity of local pain was 0 (Table 3).

Table3 Short term outcomes (2 week after treatment with 1-2 injections)

Outcome	Number n= 54 (%)
Direct treatment response:	
No response	3 (5.56)
Partial response, not satisfactory	6 (11.11)
Partial response, satisfactory	13 (24.07)
Complete resolution of symptoms	32 (59.26)
Patient perceived improvement:	
Much worse	1 (1.85)
Worse	2 (3.70)
Not better/ not worse	2 (3.70)
Better	11 (20.37)
Much better	38 (70.37)
Median severity of local pain (P ₂₅ , P ₇₅)	0 (0, 2)

Table 4: Outcome measures during follow-up

Outcome	Follow-up period		
	1 month	3 months	6 months
Patient perceived recovery (% better or much better)	85.19	83.33	79.63
Median severity of local pain (P ₂₅ , P ₇₅)	1.0 (0.0, 3.25)	0.0 (0.0, 2.0)	0.0 (0.0, 1.0)
Success Resolved Improved			30(55.56%) 13(24.07%)
Failed			11(20.37%)

Results of the 6 month follow-up are shown in table 4.

There was significant improvement in pain score using VAS after 2 weeks and 6 months of treatment ($p < 0.05$, Table 5).

Table 5: VAS evaluation pre- and post-injection

VAS	Mean \pm SD (Median)	p value*
Pre-injection	5.70 \pm 1.66 (5)	
Post-injection 2 week	1.72 \pm 2.57 (0)	
Post-injection 6 month	1.26 \pm 2.19 (0)	
Difference between pre-injection and post-injection 2 week	-3.98 \pm 1.76 (-5)	0.000
Difference between pre-injection and post-injection 6 month	-4.44 \pm 1.63 (-5)	0.000
Difference between post-injection 2 week and post-injection 6 month	-0.46 \pm 1.00 (0)	0.001

*Paired-samples t-test

At the final 6 month follow-up examination, 43 of the 45 digits who were asymptomatic at 2 weeks after the steroid injection were still asymptomatic. Thirty digits (55.56%) had complete resolution of symptoms and 13 digits (24.07%) with improved outcome did not require further treatment. Therefore the overall success rate was 79.63% (43 out of 54 digits). The remaining 11 digits were scheduled for surgery.

There were no serious adverse reactions of tendon failure or post-injection infection. Out of the 54 injected digits 9 had pain at the injection site (16.67%) and 2 had steroid flare reaction (3.70%).

DISCUSSION

Different conservative modalities have been recommended as treatment of trigger fingers like NSAIDs, splinting and injection of

steroids with success rates of 57-97% [11, 12, 13, 15, 16, 17]. We have conducted this study to find the effectiveness of corticosteroid injection in our context.

Females were affected more in our study (60%) and also in other studies such as Cecen et al 78.6% [18], Shakeel et al 70% [19], Wojahn et. al 66% [20], Dala-Ali et al 59% [21]. The mean age of our study was 40.14 years which is less as compared to other studies- Dala-Ali et al 62 years [21], Wojahn et al 59.2 years [20], Cecen et al 54.96 years [18].

Thumb was the most commonly affected digit in most studies as was in our case (44.44%). In the study of Cecen et al [18] thumb was affected in 58.6%, Anderson et al 43% [22], Wojahnet al 37.4% [20], Lambert et al 29.27% [12]. However in some studies ring finger was commonly affected than thumb- 31.11% ring finger in Dala-Ali et al [21], 33% in Taras et al [23] and 45.83% in Murphy et al [13].

Marks and Gunther [11] in their series of 108 trigger digits found 92% of trigger thumb cured with single dose of steroid injection and 97% cured after repeated injections. Similarly high success rate were recorded by Freiberg et al 93% [6], Cecen et al 83% [18] and Clark et al 83% [24]. Other studies have demonstrated lower success rates (Shakeel et al 70% [19], Kolind-Sorensenb 67% [3], Dala-Ali et al 66% [21], Murphy et al 64% [13], Rhoades et al 63% [25], Taras et al 62% [23], Lambert et al 60% [12], Maneerit et al 47% [14]). Sato et al [26] found the trigger cure rate of 57% with single injection and 86% after two injections.

Our study had a success rate of 79.63%. In a recent study by Wojahn et al [20] the long term (5 year) treatment success rate after a

single injection was only 45%. The long term result of our study is yet to be evaluated.

The pre-injection median VAS score in our study was 5. This decreased to 0 at 6 months. In a similar study by Cecen et al [18], the VAS decreased from a median of 5 at commencement of treatment to 2 after 6 weeks and 1 after 6 months of treatment.

The overall complication rate was 20.37% with 16.67% pain at injection site and 3.70% steroid flare. Anderson et al [22] had 38% complications (25% pain at injection site, 6% atrophy of subcutaneous fat, 1.3% flare reaction among others). In the study of Peters-Veluthamaningal et al [27] there were hot flushes in 36% patients and steroid-flare in 24%. In the study of Shakeel et al [19] 20% had complications- continuous pain at injection site in 2% and recurrence of triggering in 18%. None of these studies had serious adverse events such as tendon rupture or infection as was the case in our study.

CONCLUSION

Corticosteroid injection is still recommended because the procedure is relatively simple and obviates the need for surgical intervention. Steroid injection should be considered as a first line treatment for trigger finger.

LIMITATION

The sample was small. The duration of follow-up was relatively shorter and though the early results of local steroid injection are promising, the long term success is yet to be evaluated. Also we did not compare the results between the two treatment centers.

ACKNOWLEDGEMENT

The authors are thankful to the colleagues of CMCTH and JMCTH for their assistance in collection of patients and managing their follow-up. Also our sincere gratitude goes to all our patients without whom this study would not have been possible.

AUTHOR'S CONTRIBUTION

BDS- conception of study and design, data collection, analysis and interpretation of data, manuscript writing; **DNS-** conception of study and design, data collection.

SOURCE OF SUPPORT: None

CONFLICT OF INTEREST: The authors declare that there is no conflict of interest regarding the publication of this article.

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