



## Local Corticosteroid and Anesthetic Injection in Trigger Finger Deformity

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### Authors' contributions

This work was carried out in collaboration between all authors. Author VK designed the study and gathered the data. Author ATO helped in design of the study and wrote the final draft of the manuscript. Author ES helped with statistical analysis. Author BG managed the literature searches. All authors read and approved the final manuscript.

### Article Information

DOI: 10.9734/BJMMR/2015/17666

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Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=1119&id=12&aid=9288>

Original Research Article

Received 23<sup>rd</sup> March 2015

Accepted 5<sup>th</sup> May 2015

Published 18<sup>th</sup> May 2015

### ABSTRACT

**Objective:** Efficacy of local corticosteroid and anesthetic injection was investigated in adult trigger finger deformity.

**Materials and Methods:** Sixty four fingers of 56 patients (40 females mean age: 44(33-58), 16 males mean age: 45(37-62) who did not benefit from 4 weeks of NSAID treatment and rest were referred to orthopaedics or physical therapy departments of our hospital for trigger finger deformity. One cc. depomedrol (methylprednisolone acetate) and 2 cc. citanest (prilocain hydrochloride)

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mixture was injected at the level of A1 pulley. The follow up period was 3 months.

**Results:** In forty of 56 patients (32 female, 8 male) triggering and pain completely disappeared. Triggering disappeared but pain was persistent in 8 patients and both triggering and pain were persistent in 8 patients.

**Conclusion:** Injection of local corticosteroid and anesthetic drug mixture in treatment of trigger finger deformity is an easy, cheap and effective method. We conclude that it is useful to apply this treatment for once before decision to surgery.

*Keywords: Corticosteroid; anesthetic; injection; trigger finger.*

## 1. INTRODUCTION

Trigger finger deformity is a stenosing tenosynovitis related with a nodule formation in annular sheath of flexor tendons of fingers [1,2]. Clinically, triggering occurs when finger comes to flexion from extension by squeezing of the nodule over the stenosing sheath and a click is heard by the completion of the motion. Occasionally triggering occurs in every attempt while pain increases by palpation of the nodule. Trigger finger deformity is mostly observed in middle-aged female [3] however it can be observed in both gender and in all age groups. Treatment of trigger finger deformity consists of medication with physical therapy modalities, local corticosteroid injections and surgical release of stenosing sheath.

In this study we aimed to investigate the efficacy of injection of local corticosteroid and local anesthetic mixture. The injection technique is as follows: [4,5,6,7]. The A1 pulley overlies the metacarpal neck and marks the proximal border of the flexor tendon sheath. This proximal border is roughly in line with the distal palmar crease in the index, middle, ring and little fingers. In the thumb, proximal crease of the thumb may be used as a surface marker. The needle is inserted on the distal palmar crease through the skin to the bone over the finger involved; it is then withdrawn 1 cm thus the tip of the needle is now in the flexor tendon. The syringe is removed as the needle is left in its place. The patient is asked to slowly flex and extend the digit. If the needle moves as the digit is moved this confirms that the needle is in the tendon. Then, the needle is withdrawn about 1mm until it does not move with movement of the digit anymore. This time it is in the gap between the tendon and the A1 pulley. With gentle pressure, the tip of the needle is passed into the flexor sheath.

## 2. MATERIALS AND METHODS

The inclusion criteria were patients with the complaint of triggering and / or pain in any of the

fingers and symptoms persisting in spite of NSAID treatment and rest in this prospective study. The exclusion criteria were patients who had other hand conditions or degenerative joint disease, patients who benefitted from other conservative treatment methods such as NSAID or rest and patients who underwent surgical release. Approval was obtained for this study from the Ethics Committee of the Institution.

One cc. of Depomedrol (methylprednisolone acetate) and 2 cc. of Citanest (prilocain hydrochloride mixture) was injected by an insulin injector beneath the A1 pulley of the patients. Patients were called for clinical examination just after one month and results were recorded. The results were classified as good, moderate and bad as classified as in the study of Anderson [5]. The follow up period was 3 months.

## 3. RESULTS

64 fingers of 56 patients [40 female mean age: 44(33-58), 16 male mean age: 45(37-62)] were involved in the study.

Twenty eight of females were housewives, eight were manual-workers and four patients were teachers. Twelve of male patients were manual-workers while four were retired officers. None of the patients had rheumatoid arthritis or any other rheumatologic disorders. Thirty-two of patients (24 female, 8 male) were diabetic. Triggering was thought to be due to diabetes in these patients while others were thought to be related with manual working because all diabetic female patients were housewives and one of manual-worker male patients was diabetic.

Three patients stated that they were operated for a trigger finger deformity and three of patients stated that they had injection treatment for another finger previously. These patients were also diabetic. Twenty four patients had triggering in thumb, eight patients in 2<sup>nd</sup>, twelve patients in 3<sup>rd</sup>, four patients in 4<sup>th</sup>, four patients in thumb and

2<sup>nd</sup> and four patients had triggering deformity in 2<sup>nd</sup> and 3<sup>rd</sup> fingers (Table 1). All of the patients stated that complaints started up on volar region of the hand proximal to metatarsophalangeal joint as pain then triggering added to the symptom in some of the patients. Twenty patients defined pain as the main symptom while thirty six patients suffered from both triggering and pain. Four patients had flexion deformity without any triggering in 2<sup>nd</sup> and 3<sup>rd</sup> MP joint with pain increased by palpation and passive joint motion. However these patients had triggering in these joints just after injection with immediate recovery of flexion deformity (Table 2). At one month after the injection, forty of 56 patients (32 female, 8 male) were observed to have no more triggering and pain (good) while eight patients (4 female, 4 male) had pain without triggering (moderate) and eight patients (4 female, 4 male) had both triggering and pain in the first month control (bad).

In the 3<sup>rd</sup> month control, we nearly had the same results except 2 patients who were in the good group (with no pain and triggering) was in the

moderate group at third month (pain but not triggering) and one patient who was in the moderate group (pain but no triggering) was in the bad group (both triggering and pain) at the third month (Table 3). T test was used for statistical analysis. The positive effects of the treatment was statistically significant (p=0.01) while the difference between the first and third month results was statistically insignificant (p=0.322) (Tables 4 and 5). The patients who had both triggering and pain in the first month had more complaints and they were offered a surgical treatment. Patients with pain but no triggering were consulted for physical therapy and they were given oral antiinflammatory drugs and they are still under control for a possible surgical treatment. We did not have any complications related with the treatment.

#### 4. DISCUSSION

The etiology of trigger finger deformity is not clear. However, in a histopathological study of Sbernardori et al. [8], a deeper placed third layer made of irregular collagen fibers and abundant

**Table 1. Distribution of the deformity**

1.finger	2.finger	3.finger	4.finger	1.+2.fingers	2.+3.fingers
24	8	12	4	4	4

**Table 2. Findings of clinical examination on 1<sup>st</sup> month**

No pain-no triggering (Good)	Pain without triggering (Moderate)	Pain and triggering (Bad)
40 (32 Female, 8 Male)	8 (4 Female,4 Male)	8 (4 Female,4 Male)

**Table 3. Findings of clinical examination on 3<sup>rd</sup> month**

No pain-no triggering (Good)	Pain without triggering (Moderate)	Pain and triggering (Bad)
38 (32 Female, 6 Male)	9 (6 Female,3 Male)	9 (2 Female,7 Male)

**Table 4. Statistical analysis of response to treatment at first month (t test)**

		Frequency	Percent	Valid percent	Cumulative percent
Valid	None	8	14,3	14,3	14,3
	Moderate	8	14,3	14,3	28,6
	Good	40	71,4	71,4	100,0
	Total	56	100,0	100,0	

**Table 5. Statistical analysis of response to treatment at third month (t test)**

		Frequency	Percent	Valid percent	Cumulative percent
Valid	None	9	16,1	16,1	16,1
	Moderate	9	16,1	16,1	32,1
	Good	38	67,9	67,9	100,0
	Total	56	100,0	100,0	

extracellular matrix was present instead of normal two layered structure of A1 pulley. In some studies, a success rate up to 80% was reported in treatment of triggering deformity by a single corticosteroid injection [5,6,9]. Surgical release of A1 pulley is possible for unsuccessful conservative trial. Dahabra and Sawaqed [10] stated that percutaneous A1 pulley release was an effective, appropriate, safe and well tolerated method in the treatment of trigger finger deformity. However they also stated that the process should have been performed by experienced hand surgeons to avoid serious complications. It must be kept in mind that longitudinal injuries might occur in this method and it would not be easy to find an experienced hand surgeon for all the cases.

There a few of studies about the injection treatment of trigger finger deformity in the literature. Griggs et al. [11], reported 50% relief of symptoms by local injection treatment in diabetic patients with trigger finger deformity. Reviewing the literature, they stated that results were more succesful in nondiabetic patients. We also observed that results were better in nondiabetic patients but limited number of patients is a disadvantage of our study to make an appropriate comparison. Murphy et al. [9], reported 64% good results with single dose of corticosteroid with 20% good results with placebo and concluded that steroid injection was their favourite nonoperative treatment modality. Anderson et al. [10], reported 61% good results with 12% bad results in 77 trigger finger deformity of 55 patients after a mean 4.6 years follow up. Peters-Veluthamaningal et al. [12] have reported in a metaanalysis study that local corticosteroid and local anesthetic combination yielded better results than local anesthetic injection and 40% of patients benefitted from the treatment.

The better results of our study is probably due to short term observation of the patients because Anderson and some other authors stated that recurrence had been observed in some of the good results in their studies and second or more injections might be necessary [5,6]. However Cyriac et al. [13], defined that steroid injection was effective and safe in trigger finger deformity but efficacy lasted nearly for one year.

Complications such as a tendon rupture due to lack of appropriate injection beneath the tendon sheath was reported in the literature [14]. However, Kazuki et al. [15] reported no complication due to local steroid injection treatment in 129 trigger finger deformity of 100

patients and stated that extrasynovial application of the injection was an effective and safe method in the treatment of trigger finger deformity. Kazuki also concluded that spending special effort was not necessary in order to inject the drug into the tendon sheath.

All the injections were performed by a single specialist in our study and we did not face any complications. However corticosteroid injections may lead to fears about the adverse effects in diabetic patients. Wangg and Hutchinson [16], stated that single dose of methylprednisolone might cause a hyperglycemic effect up to five days in diabetics but it also prolonged the time for surgery twice. Nimigan et al. [17], defined that the steroid injection treatment had significantly lower succesful results in diabetic patients and this treatment should be the first step of nondiabetics. As we mentioned before, we also had lower success rates in diabetic patients. We also conclude that it is necessary to be cautious about a possible hyperglycemic attack and it might be appropriate not to make this modality the first step of treatment in diabetic patients having a trigger finger deformity but as Catalano et al. [18] have stated that most of the patients experience slight increases beyond baseline which do not pose an apparent clinical risk. For safety reasons, we did not think to perform a second shot although such studies are present in the literature. Most of our patients were diabetic and possible complications like hyperglycemia or tendon ruptures due to repetetive corticosteroid injections might have occured. As reported in previous studies [10,11,12], local steroid injections seem to have diminishing efficacy. We also had slightly decreasing good results in the 3<sup>rd</sup> month and probably the good results will be lower at the end of the first year thus local injections might not be the definite treatment for all the patients especially for those who have predispositions like diabetes mellitus.

Despite the limited number of patients of our study and a short follow up time, we conclude that, local corticosterid and anesthetic drug injection treatment for trigger finger deformity is a cheap, safe and effective treatment modality especially for short term. We think that it is advisable to perform once before decision to surgery.

## 5. CONCLUSION

Local corticosteroid and anesthetic injection is an easy, cheap and effective method for treatment of trigger finger deformity. We

conclude that it is an efficient tool that can be used before carrying with surgery.

## CONSENT

All authors declare that written informed consent was obtained from the patients for publication of this study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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