

# Efficacy of Steroid Injection in the Treatment of Trigger Finger

Adeel Ahmed Siddiqui<sup>1</sup>, Farooq Mamji<sup>2</sup>, Badaruddin Sahito<sup>3</sup>, Syed Mohammad Tariq<sup>4</sup>,  
Dileep Kumar<sup>5</sup>, Syed Itaat Hussain Zaidi<sup>6</sup>

## ABSTRACT:

**Objective:** To assess the efficacy of local steroid injection in trigger finger.

**Materials and Methods:** This prospective study was conducted at department of Orthopaedics, Civil Hospital, Dow University of Health Sciences, Karachi, from March 2012 to 2013. Males and females with complain of trigger finger were included in this study during the specified period. All patients were injected depomedrol with plain xylocaine at the nodule site and functional outcome was assessed with respect to pain relief and finger movement.

**Results:** Study included 43 patients with trigger finger. 29 were males and 14 were females. Right hand fingers were involved in 24 patients, remaining had left hand fingers involvement. 10 involved the index finger, 7 middle finger, 4 ring finger, 10 little finger and 12 thumb. 9 patients had associated rheumatoid arthritis and 15 were known cases of diabetes. Remaining patients were primary with no known co-morbid. All patients had pain relief initially and regained movement of finger. 10 patients required repeated injection after 3 months. Maximum pain relief and regaining of movement after steroid injection was 4 months.

**Conclusion:** Local steroid injection provides excellent symptomatic pain relief and regained movements without any complication in patients with trigger finger.

**Key words:** Steroid, Local anesthesia, Trigger finger, Pain relief, Movements

## INTRODUCTION:

Trigger finger also known as flexor stenosing tenosynovitis is one of the most common conditions seen in the clinical practice of hand surgery.<sup>1</sup> The lifetime risk of developing trigger finger is between 2% and 3%.<sup>2</sup> The condition has a reported incidence of 28 cases per 100,000 population per year.<sup>3</sup> Trigger fingers are more common with certain medical conditions such as gout and diabetes. Repeated and strong gripping may lead to the condition. In most cases, the cause of the trigger finger is not known. Trigger finger may start with a feeling of discomfort at the base of the finger or thumb, where the finger joins the palm. This area is often sensitive to pressure. A lump might be also felt. Other symptoms may include pain, popping, catching feeling, limited finger movement etc. Patients present with a painful triggering or clicking during active flexion of

an affected digit and the finger get locked in the flexion (Figure 1a & 1b). It needs some force to straighten the finger. This is due to the loss of normal smooth gliding of the tendon beneath the pulley system, most commonly at the level of the A1 pulley. This may be a result of a nodule in the tendon or a diffuse swelling within the sheath as a result of a tenosynovitis.<sup>4</sup> The A1 pulley is affected more, owing to the high local forces and a steep pressure gradient; it is also the site of maximal tendon excursion. Alternative sites of tendon triggering have been described, including the A2 and A3 pulleys and the palmar aponeurosis.<sup>5</sup> Little finger and thumb are the most common digits affected.<sup>6</sup> Exact etiology of trigger finger is unknown but it is commonly associated with diabetes mellitus, rheumatoid arthritis, hypothyroidism, carpal tunnel syndrome and De Quervain's disease.<sup>7,8</sup> Trigger finger can be treated with analgesic and splintage,

✉ **Dr. Adeel Ahmed Siddiqui**  
Assistant Professor  
Department of Orthopaedic Surgery  
Civil Hospital & Dow Medical College  
Dow University of Health Sciences  
Karachi

Email: dr.mamji@hotmail.com

✉ **Dr. Farooq Mamji**  
Associate Professor  
Department of Orthopaedic Surgery  
Civil Hospital & Dow Medical College  
Dow University of Health Sciences  
Karachi

✉ **Dr. Badaruddin Sahito**  
Assistant Professor  
Department of Orthopaedic Surgery  
Civil Hospital & Dow Medical College  
Dow University of Health Sciences  
Karachi

✉ **Dr. Syed Mohammad Tariq**  
Assistant Professor  
Department of Orthopaedic Surgery  
Civil Hospital & Dow Medical College  
Dow University of Health Sciences  
Karachi

✉ **Dr. Dileep Kumar**  
Assistant Professor  
Department of Orthopaedic Surgery  
Civil Hospital & Dow Medical College  
Dow University of Health Sciences  
Karachi

✉ **Dr. Syed Itaat Hussain Zaidi**  
Assistant Professor  
Department of Orthopaedic Surgery  
Dow International Medical College  
Dow University of Health Sciences  
Karachi

Received: 03-01-2016

Revised: 17-02-2016

Accepted: 22-02-2016

local steroid injection and surgical release of pulley.<sup>9</sup>The goal of treatment in trigger finger is to eliminate the swelling and catching/locking, allowing full, painless movement of the finger or thumb. If non-surgical treatments do not relieve the symptoms, surgery may be recommended. The goal of surgery is to open the pulley at the base of the finger so that the tendon can glide more freely. The clicking or popping goes away first. Finger motion can return quickly, or there can be some stiffness after surgery.<sup>10</sup>Occasionally, hand therapy is required after surgery to regain better use. The technique of steroid injection into the flexor sheath as an effective treatment is described by Howard in 1953.<sup>11</sup>Green had classified trigger finger on the basis of severity of problem. (Table 1)<sup>12</sup>

Figure: 1a

The pulley and tendon in a finger, gliding normally

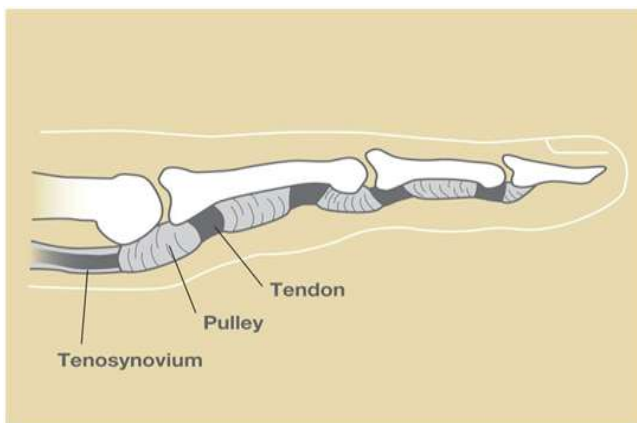


Figure: 1b

If the pulley becomes too thick, the tendon cannot glide through it

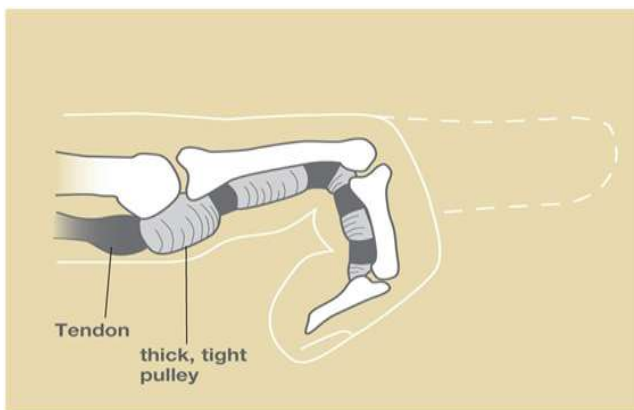


Table: 1

Green's Classification to Grade the Severity of Trigger Finger

Grade I	Pain/history of catching
Grade II	Demonstrable catching, but can actively extend the digit
Grade III	Demonstrable locking, requiring passive extension
Grade IV	Fixed flexion contracture

## MATERIALS AND METHODS:

This prospective study was conducted at department of Orthopaedics, Civil Hospital, Dow University of Health Sciences Karachi, from March 2012 to 2013. Males and females with complain of trigger finger were included in this study during the specified period. All patients were injected depomedrol 1ml (20 mg) with plain xylocaine 1ml at the nodule site and functional outcome was assessed with respect to pain relief and finger movement.

## RESULTS:

Study included 43 patients with trigger finger. 29 were males and 14 were females. Right hand finger was involved in 24 patients, remaining had left hand finger involvement. 10 patients had involvement of index finger, 7 middle finger, 4 ring finger, 10 little finger and 12 thumb. 9 patients had associated Rheumatoid arthritis and 15 were known cases of diabetes. Remaining patients were primary with no known co-morbid. All patients had pain relief initially and regained movement of finger. 10 patients required repeated injections after 3 months. Maximum pain relief and movement after steroid injection was 4 months (Table 2).

Table: 2  
Involvement of fingers  
N= 43

Males	29
Females	14
Right hand finger	24
Left hand finger	19
Index finger	10
Middle finger	7
Ring finger	4
Little finger	10
Thumb	12

## DISCUSSION:

Steroids are considered as the first line treatment for trigger finger. The technique of injecting local steroid is simple and cost effective. Daniel in his study compared the results of steroid with placebo injection in trigger finger. The ability of a single injection of steroid and lidocaine to bring about cure of primary trigger finger was determined and compared with a control placebo injection of only lidocaine.<sup>13</sup> A controlled double-blind prospective study of injection of methyl prednisolone acetate plus a local anaesthetic against a control injection of local anaesthetic, in the treatment of trigger finger and thumb has shown a 60% success rate for the steroid injection against 16% for the control group ( $p < 0.05$ ). This is the first controlled trial of local steroid therapy in this condition.<sup>14</sup> In our study 77% success rate was found. This is in line with this study. In a study one hundred and nine trigger fingers were reviewed. Thirty-four digits eventually underwent surgical release of the A1 pulley, while the other 75 digits were treated with local steroid injection only. These data suggest that

surgical management may be the next best option in patients with trigger finger who continue to be symptomatic after a single injection. Subjective data from the patient questionnaire responses also supports surgery as a reasonable choice after one injection failure.<sup>15</sup>

Patel in his comparative study of splintage and steroid injection has showed successful results in 33 (66%) of the splinted digits and 42 (84%) of injected digits. Fifty percent of the 10 splinted thumbs and 70% of the 40 splinted fingers had a successful outcome. Of the 17 unsuccessfully treated digits in the splinted group, 15 were later cured with injections and 2 required surgery. All of the 7 unsuccessfully treated digits in the injected group were cured with surgery. Splinting offers an alternative for patients who have a strong objection to cortisone injection.<sup>16</sup> Sean in his retrospective study of 54 diabetic patients with 121 trigger digits treated over a 3-year period by one to three injections of corticosteroid mixed with local anesthetic found that 50% diabetic patients responded to steroid injection. Insulin-dependent diabetic patients have a higher incidence of multiple digit involvement (59% of patients) and of requiring surgical release for relief of symptoms (56% of digits) when compared to non-insulin-dependent diabetic patients (28% of patients with multiple digit involvement; 28% of digits requiring surgery).<sup>17</sup>

A case has reported of delayed rupture of the flexor digitorum superficialis and profundus tendons after the use of local corticosteroid injections for trigger finger.<sup>18</sup>

In our study we didn't had this complication. In a prospective study published at Osaka, one hundred and twenty-nine trigger fingers were investigated in 100 adult patients. 76 were women and 24 were men. Pain and snapping were relieved in 98% and 74% of cases, respectively. Recurrence occurred in about half of patients, but the same clinical benefit was obtained after re-injection. Surgery was performed for seven fingers. No complications of steroid injections were observed.<sup>19</sup>

We also have found no complications in our study. One hundred and eight trigger fingers and thumbs were treated by Micheal in 74 consecutive patients with steroid. Minimum follow-up was 1 year. Eighty four percent of trigger fingers and 92% of trigger thumbs were cured with a single injection and a repeat injection for treatment of recurrent symptoms raised these figures to 91% and 97%, respectively. There were no complications. He concluded that intra-synovial injection of a steroid compound is the appropriate initial treatment for trigger finger and thumb.<sup>20</sup>

2 groups were studied prospectively to evaluate steroid injection placement and efficacy by John. In 1 group, intra-sheath injection and in the other subcutaneously injection was given. The confirmed all-sheath injection group exhibited a 47% good response, the mixed sheath and subcutaneous group had a 50% good response, and the all-subcutaneous group had a 70% good response. The results of this study suggest that true intra-sheath injection offers no apparent advantage over subcutaneous injection in the treatment of trigger digits.<sup>21</sup>

Trigger finger is an underdiagnosed hand disorder

causing disability in longstanding diabetic patients. Sixty diabetic patients, 39 insulin-dependent diabetes mellitus (IDDM) and 21 non-insulin-dependent diabetes mellitus (NIDDM) and 60 non-diabetic patients were examined. All were initially treated by steroid injections; failure to alleviate symptoms was the indication for surgery. Significantly, a higher recovery rate upon steroid injection was achieved in control patients as compared with diabetic ones ( $p < 0.001$ ). IDDM patients required more surgery compared with NIDDMs and in 13.3% of diabetic patients, the surgical outcome was not successful. Steroid injection as the first mode of therapy is highly recommended although not always successful.<sup>22</sup> In our study 15 patients were diabetic and all of them had successful results after steroid injection.

Forty-three patients were reviewed between 17 and 113 months (mean of 47 months) following surgery for acquired stenosing tenosynovitis of the fingers or thumbs. 32 (60.4%) of the 53 operations were completely successful. Of the remaining 21 operations, 26% either failed to relieve all symptoms, or symptoms had recurred at review. 15 operations led to complications that bothered the patient to some extent. The three major complications all followed operations performed by junior surgeons. The importance of an adequate trial of conservative therapy to avoid unnecessary surgery is emphasized.<sup>23</sup> Studies have documented that steroid injection therapy should be the first-line treatment of trigger fingers in non-diabetic patients. In diabetics, the success rate of steroid injection is significantly lower. Injection therapy for type I diabetics was ineffective in this study. Surgical release of the first annular (A1) pulley is most effective overall in diabetics and non-diabetics alike, with no higher rates of surgical complications in diabetics.<sup>24,25</sup> In our study all diabetics were treated successfully by the steroid injection.

#### CONCLUSION:

Steroid injection along with a local anesthetic agent provides excellent symptomatic pain relief and regained movement without any complication in patients having trigger finger.

#### REFERENCES:

1. Newport ML, Lubbock MD, Lane LB, Manhasset NY, Stuchin SA. Treatment of trigger finger by steroid injection. *J HAND SURC* 1990;15A:748-50
2. Benan M, Dala-Ali, Nakhdjevani A, Lloyd MA, Frederik B, Schreude FBR. The Efficacy of Steroid Injection in the Treatment of Trigger Finger. *Clinics in Orthopedic, Surgery* 2012;4:263-8
3. Verdon ME. Overuse syndromes of the hand and wrist. *Prim Care* 1996;23:305-19
4. Strom L. Trigger finger in diabetes. *J Med Soc N J*. 1977;74(11):951-4
5. Akhtar S, Bradley MJ, Quinton DN, Burke FD. Management and referral for trigger finger/thumb. 2005; 331 (75 07): 30-3
6. Gorsche R, Wiley JP, Renger R, Brant R, Gemer TY, Sasyniuk. Prevalence and incidence of stenosing flexor tenosynovitis (trigger finger) in a meat-packing plant.

- J Occup Environ Med 1998;40 (6): 556-60
7. Kolind S V. Treatment of trigger fingers. Acta Orthop Stand 1970;41:428-32
  8. Rhoades CE, Gelberman RH, Manjanis JF. Stenosing tenosynovitis of the fingers and thumb. Clin Orthop 1984; 190:236-8
  9. Freiberg A, Mulholland RS, Levine R. Non-operative treatment of trigger fingers and thumbs. J Hand Surg Am. 1989;14(3):553-8
  10. American Society for Surgery of Hand (ASSH). Accessed on 2-1-2016
  11. Howard LD Jr, Pratt DR, Bunnell S. The use of compound F (hydrocortone) in operative and non-operative conditions of the hand. J Bone Joint Surg Am. 1953;35 (4): 994-1002
  12. Green D, Hotchkiss R, Pederson W, Wolfe S. Green's operative hand surgery. 5th ed. London: Churchill Livingstone; 2005
  13. Daniel M, Joseph MF, Mark P, Koniuch. Steroid versus placebo injection for trigger finger. J Hand Surg Am. 1995;20(4):628-31
  14. Lambert MA, Morton RJ, Sloan JP. Controlled Study of the Use of Local Steroid Injection in the Treatment of Trigger Finger and Thumb. J Hand Surg Br. 1992;17 (1):69-70
  15. Benson LS, Amy JP. Injection versus surgery in the treatment of trigger finger. The Journal of Hand Surgery 1997;22 (1):138-40
  16. Patel MR, Lynn B M. Trigger fingers and thumb: When to splint, inject, or operate. The Journal of Hand Surgery 1992;17(1):110-3
  17. Sean MG, Arnold P, Lewis B, Christopher S, Edward A, Kavi S. Treatment of trigger finger in patients with diabetes mellitus. The Journal of Hand Surgery 1995; 20(5): 787-9
  18. Brian TF, Eric PH, Ryan A F, Michael AT. Delayed Flexor Digitorum Superficialis and Profundus Ruptures in a Trigger Finger After a Steroid Injection: A Case Report Journal of Hand Surgery 2005;30(3):479-82
  19. Kazuki, Egi T, Okada M, Takaoka K. Clinical outcome of extrasynovial steroid for trigger finger Injection. Hand Surg 2006; 11(1-2):1-4
  20. Michael RM, Stephen FG. Efficacy of cortisone injection in treatment of trigger fingers and Thumb. The Journal of Hand Surgery 1989;14(4):722-7
  21. John ST, James SR, Wayne TP, Fara M, Dean GS. Corticosteroid injections for trigger digits: Is intrasheath injection necessary? The Journal of Hand Surgery 1998; 23(4):717-22
  22. Shalom S, Yoram K, Eddy K. Outcome of trigger finger treatment in diabetes. Journal of Diabetes and its Complications 1997;11 (5):287-90
  23. Nimigan AS, Ross DC, Gan BS: Steroid injections in the management of trigger fingers. Am J PhysMed Rehabil 2006;85:36-43
  24. Mukund R, Vijay JM. Percutaneous release of trigger digit with and without cortisone injection The Journal of Hand Surgery 1997; 22(1):150-5
  25. Schubert C, Helen G, Hui-Chou, Alfred PS, Deune EG. Corticosteroid injection therapy for trigger finger or thumb: a retrospective review of 577 digits. Hand (N Y). 2013 Dec; 8(4): 43944 PMID: PMC3840755. Published online 2013 Jul 12. doi: 10.1007/s11552-013-9541-6
  26. Wiwanitkit S, Wiwanitkit V. Trigger Digits and Diabetes Mellitus. N Am J Med Sci. 2012; 4(3): 117-9. PMID:

