Research Article

# To compare the outcome of local infiltration of corticosteroid and percutaneous release of pulley in treatment of trigger finger

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## Abstract

**Background**: Stenosing tenosynovitis of fingers is one of the common tendinopathy attended in orthopaedic practice. A number of methods have been described for the treatment of this problem. Treatment ranges from conservative management to surgical procedures. Stenosing tenosynovit is also known as Trigger finger. **Material & Methods**: in this Prospective study all patients presented with trigger finger Grade 2 and 3 were randomly allocated into 2 groups. One group received local corticosteroid injection and in the other group, percutaneous release of pulley was performed as treatment option. These patients were then followed and assessed weekly over a period of two month and their progress noted. **Results:** We studied a total of 42 patients. Majority (71.4%) were females. The commonest age group is 40-50 years olds (56.6%).The most common presenting symptom was pain with triggering (52.3%). There was significant improvement in pain in the first two weeks in both groups but there was better improvement of pain in the corticosteroid group initially especially after first week. As for the triggering, there was significant improvement noted in first week in corticosteroid group but there was no difference in degree of improvement between both the groups after four week. The corticosteroid group had a complication rate of 10% whereas the percutaneous release group complication rate was 18.1%%. The recurrence rate was comparable in both the groups. **Conclusion**: Trigger finger is a common condition in orthopaedic practice. The commonly affected fingers are the centrally located on the palm. Local infiltration corticosteroid percutaneous release of pulley gives comparable results in long follow-up however corticosteroid injection gives better result initially with less complication.

**Key words**- Trigger finger, Percutaneous release, Corticosteroid injection, Pulley.

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## Introduction

Stenosing tenosynovitis of finger, also known as trigger finger is a common tendinopathy encountered in orthopaedic practice [1]. Most of the patients presented with complaint of inability to flex or extend the finger properly. Any of the fingers can be involved but the ring, thumb and long middle finger get involved commonly as compare to index or small fingers [2,3]. Several causative factors have been described for trigger finger; still the precise etiology has not been identified. Understandably, repetitive finger movements and local trauma are possibilities [4]. in some studies dominant hand supposes to have greater incidence of trigger finger because of repetitive stress and degenerative force [5]. Primary trigger finger occurs more frequently in middle-aged women and in most of the cases it remains idiopathic in origin. Secondary trigger finger commonly occur in association with diabetes mellitus, gout, rheumatoid arthritis and other connective tissue disorders [1]. In trigger finger, inflammation and hypertrophy of the retinacular sheath gradually restricts the motion of the flexor tendon. This retinacular sheath forms a pulley system. This system comprised of a series of annular and cruciform pulleys in each digit. This system serve to maximize the production of force of flexor tendon and movement efficiency .The first annular pulley (A1) located above the metacarpal head is the most frequently affected pulley in trigger finger, though in triggering the second and third annular pulleys (A2 and A3, respectively) are also found to be involved in some cases, as well as the palmar aponeurosis [6]. Pathological involvement of pulley can be of two types, nodular and diffuse types

Manuscript received: 22nd Jan 2016
Reviewed: 01st Feb 2016
Author Corrected: 08th Feb 2016
Accepted for Publication: 19th Feb 2016

[7]. These finding is based on palpation of swelling of the tendon sheath. Nodular type is frequently encountered in idiopathic trigger fingers while diffuse type is seen in association with several connective tissue disorders. Grading of trigger finger has been done according to severity. Commonly used classification is by Green's [8] (figure 1).

**Figure 1: Grading 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 |

A number of treatment modalities has been described ranging from conservative treatment (consisting of NSAIDS splinting ice fomentation, massage), corticosteroid injection to surgical release (percutaneous or open release). Surgical release is recommended if conservative treatment fails. Trigger fingers respond well to conservative treatment in most of the cases but favorable response depends on type of triggering duration of complaint and severity of triggering [9]. This study was conducted to compare the outcome and efficacy of local injection of corticosteroid and percutaneous release of pulley in the treatment of trigger finger.

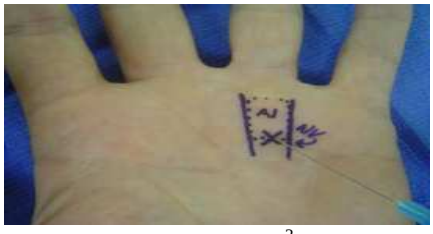
## Materials and Method

This is prospective randomized study, conducted in Department of orthopaedics at N.S,C.B medical college Jabalpur from april 2011 till april 2012. We recorded and compared the outcome of local corticosteroid injection and percutaneous release of A1 pulley, in terms of symptomatic relieve, patient satisfaction and complications. In this study, patients presented with Grade 2 and Grade 3 trigger finger were randomly allocated into 2 groups after ethical clearance. Randomization was done by random number table with the help of computer. 20 patients were treated by local corticosteroid injection (group 1) while 22 were treated by surgical release of A1 pulley percutaneously (group2). All the patients were explained about nature and cause of the study and a written consent was taken before treatment. These patients were followed up weekly for two month and 3 monthly for a year.

**Operative procedure**

**Corticosteroid injection:** An area near distal palmer crease over the A1 pulley is cleansed with sprit and providon iodine solution. A 30-gauge 0.5-inch needle is used to anesthetize tendon sheath and the area around the A1 pulley. Then mixture of 1 mL of the triamcinolone i with 1 mL of 2% lignocaine injected into flexor tendon sheath and around the nodule. The position of the needle is determined by asking the patient to actively flex and extend the finger. A small sterile dressing was applied for one day and normal routine activities were allowed immediately. Analgesic drug started for 5 days. These patients are asked to report immediately in appearance of excessive pain, swelling or sudden rise of local temperature which indicate infection [10].

**Figure 2:-** Clinical photograph demonstrating the appropriate location for a trigger finger injection. (A1: location of the A1 pulley, NV: the neurovascular structures near to A1 pulley)



**Percutaneous release:** A 3 $cm^3$ syringe is used to infiltrate 2% lignocaine around the area near A1 pulley. Patient is asked to actively flex and extend the affected digit to confirm the location of the thickened A1 pulley. A 20-gauge needle is taken and inserted with the sharp bevel parallel to the tendon along it's length. The needle is progressed up to one third the distance from the distal palmar crease to the base of the third, fourth and fifth digit. In the case of the index finger, the needle is inserted one third the distance from the distal thenar crease to index finger base. Special precaution is taken while inserting needle in thumb because of proximity of A1 pulley to radial digital nerve making this nerve susceptible to damage in a percutaneous release. The pulley is transected by stroking the needle longitudally proximally and distally [11]. These patients were assessed weekly for two months and 3 monthly for one year. In these visits patient are analyzed for improvement in symptoms, swelling, pain and patient's satisfaction. Visual analog scale was used to assess the pain in all the patients.

**Statistical Methods:** In this study descriptive statistical analysis was used to evaluate demographic data. Weekly improvement in the corticosteroid and percutaneous group was measured by Paired t test. Improvement was noted in terms of symptomatic

relieve, patient's satisfaction and complications. Unpaired t-test was used to compare the efficiency of treatment between both the groups. A p-value of < 0.05 was considered to be significant in present study.

## Results

In present study forty two patients with grade 2 and grade 3 trigger fingers were included. They were randomly allocated into 2 groups. A total of 20 patients received corticosteroid injections (group 1) and 22 patients underwent percutaneous release of A1 pulley (group 2). There were 14 middle fingers, 14 ring fingers,8 index finger 4 thumb and 2 little fingers Triggering, pain, swelling, palpable nodule or a combination of these symptoms were common complaints observed in these patients. Nodular type of trigger finger was present in all patients. Majority of the patients were female (71.4%) and belongs to 40 to 50 years age group (56.6%) with a mean age of 48.3 years in group 1 and 47.7 years in group 2.

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**Table-1:- data description**

| | **Male** | **Female** | **Grade 2** | **Grade 3** | **Mean age (years)** |
|---|---|---|---|---|---|
| Group 1 | 6 | 14 | 8 | 12 | 48.3 |
| Group 2 | 6 | 16 | 9 | 13 | 47.7 |
| Total | 12 | 30 | 17 | 15 | ----- |

Occupation wise, 33.5% were manual workers, 30.6% were semi-professionals and 35.9% were housewives. Professionals were rarely involved. More females (71.4%) were affected with trigger finger compared to males (28.6%). Dominance of the hand had no effect on the incidence of triggering (Dominant 63.8% and non-dominant 36.2%). In 65.5% of patients, this was the first episode of triggering while in 25.9 % and 8.6% presenting with second and third recurrence respectively. Among the five fingers, the most commonly involved finger was the middle and ring finger (33.3% each). Little finger was involved in very few patients. The commonest presenting complaint among patients was pain with triggering ( 52.3%, followed by triggering alone (33.1%) and pain alone (14.6% )

There was significant reduction in pain in both the groups in two month follow-up. Greater reduction in pain was reported in group 1 patients as compared to the group2, in the first week. Triggering was evaluated as per grading described above. There was better improvement noted initially in group 2 in first week. However, there was no statistically significant difference in improvement between both the groups in long follow-up. In terms of swelling of the digits, improvement was comparable during the course of the treatment in both the groups. As for patient's satisfaction, group 2 patient reached maximum satisfaction by 2$^{nd}$ week as compare to the group1 patients, who attain maximum satisfaction one week later. 10%complication rate was reported in group 1patients (1 patient claimed numbness over distal phalanx after corticosteroid injection another developed discoloration) while group 2 patients had 18.1% complication rate (2 patients developed stiffness of affected finger which responded very well physiotherapy , 1 patient developed bowstringing of tendon and 1 patient developed superficial infection treated successfully with oral antibiotic ). There were a total of 6 patients that had recurrence (recurrence rate 14.2%). 3 cases each in both groups. This, occur at 4 to 9 months after the primary procedure. Patients with recurrence were treated successfully with open release later.

## Discussion

Trigger finger is a common problem encountered in daily practice. Most of the patients respond favorably to non surgical treatment. Surgical release is considered if conservative treatment failed [12]. The decision of mode of treatment depends on grade of the trigger finger and duration of symptoms. In a similar study Miguel J. Saldana et al [13] outlined treatment of trigger fingers according to grades of severity. It is generally agreed that grade 1 trigger fingers requires no more than gentle physiotherapy and NSAIDs, if such treatment get failed then it can be treated with injection. Usually grade 4 triggering do not respond very well to conservative treatment and requires an open release. However, there is still debate on the appropriate management of grade 2 and grade 3 trigger finger. Injection of corticosteroids for treatment of trigger finger was described as early as 1953 by Howard et al [11]. Local corticosteroid injection should be attempted before surgical release as it is very efficacious (up to 93%) [2], especially in non-diabetic patients with acute symptoms and one trigger finger with a palpable nodule

[8]. It is believed that corticosteroid injection is less successful in patients with long standing disease (>6 months duration), diabetes mellitus, and multiple finger involvement because it is not very efficient to reverse the changes of chondroid metaplasia in the A1 pulley. This offers an interesting treatment modality to treat this mild condition conservatively and avoid complications associated with surgical release of A1 pulley, which includes A2 pulley injury, digital nerve injury with subsequent bowstringing of the tendons, finger stiffness and sympathetic dystrophy [14,15]. Although some time local infiltration of carticosteroid also produce complications like fat necrosis, skin hypopigmentation, dermal atrophy, transient increase of blood suger in diabetic patients [16] and infection [6]. The technique of percutaneous release for trigger finger has been described first by Lorthioir [17] in 1958. In this procedure, the MCP joint is hyperextended with the palm up, this position stretches out the A1 pulley and shifts the neurovascular structures dorsally. Success rates have been reported as over 90% with this procedure [8]; however, use of this technique is tempered because of the risk of digital nerve or artery injury. Other complications, including infection and tendon bowstringing are less common. Comparable results were obtained by Lyu SR et al. [18]. They used specially designed pulley hook and curved-blade knife and found the similar complication pattern. In another study K.I. Ha et al [19] described a technique of percutaneous release of pulley with help of specially designed knife. In this study, 185 patients with grade 3 and 4 triggering were included and most of the patients (173 patients) achieved good results. Eleven patients had persistent symptomps of triggering and surgical site pain reamin persistent in one patient. No significant complications were reported. Still there are some precautions that need to be taken while performing such procedures to avoid any possible damage the digital nerves. These include, stay in the midline of the finger, extend the finger at the metacarpophalangeal joint, keep f the needle tip in accurate position. Some studies also suggested that percutaneous release of A1 pulley could induce painful tenosynovitis associated with painful finger flexion if corticosteroid is not used with preoperative local anaesthesia [17,19].

## Conclusion

In this study both the technique has given comparable results. We did not find any difference in the recurrence rate in both methods of treatment. Both the techniques yield almost similar improvement with time, but the corticosteroid group is associated with less number of complications as compare to percutaneous release of pulley. So we recommend use of local steroid injection as a first modality of treatment in grade 2 and grade 3 trigger finger.

**Funding:** Nil,
**Conflict of interest:** None.
**Permission of IRB:** Yes

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**How to cite this article?**

Turkar R, Jain S To compare the outcome of local infiltration of corticosteroid and percutaneous release of pulley in treatment of trigger finger. *Int J Med Res Rev* 2016;4(3):314-318. doi: 10.17511/ijmrr.2016.i03.05.

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