

Steroid injection in the treatment of trigger finger

Abdul Waheed, Aimal Sattar, Israr Ahmad, Mohammad Arif Khan

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Background: Triggering of finger is one of the common conditions presenting to an orthopedic specialist clinic. Aim of this study is to investigate the efficacy of corticosteroid injections for treatment of trigger finger.

Methods: This retrospective study was carried out at the department of orthopedic and Spine, Hayatabad Medical Complex Peshawar from January 2014 to December 2016. 68 digits were treated with steroid injection with at-least one year followup. Main focus of the study was the efficacy of the injections, co-morbidities, nodule presence and Green's classification was used for the severity at presentation.

Results: We found that 72% of trigger fingers were successfully treated with steroid injections. There was difference between the efficacy of steroid injection in the different fingers, with a statistical significance between the other fingers and thumb. We also found that there was no statistical relationship between the presence of a nodule, co-morbidities or the severity of the condition over the efficacy of corticosteroid injections.

Conclusions: The study found that corticosteroid injection is an effective first line treatment for the treatment of trigger finger. We also found efficacy for treating thumb was increased as compared to other fingers. Both the nodule presence and severity of the disease at presentation had no significant effect on the efficacy of the injection.

Keywords: trigger finger, digit, steroid injections, nodule

**Rehman Medical
Institute, Peshawar**
A Waheed

**Lady Reading Hospital,
Peshawar**
A Sattar

**Hayatabad Medical
Complex, Peshawar**
I Ahmad
MA Khan

Correspondence:
Dr. Abdul Waheed, House
No. 422, Street-10, sector
F-09, Phase-06, Hayatabad,
Peshawar.
Cell: + 92-346-9097116
Email: waheedkhyberian@
yahoo.com

Introduction:

Triggering of finger is common condition presenting to an orthopedic clinic.^{1,2} Life time risk of triggering of finger is about 2.3% in non-diabetic adults after age of thirty years and in diabetic patient it is about 10%.^{1,3,4}

Patients commonly present with a triggering, may be painful or painless or clicking during movements of an affected finger.^{3,5} This is usually at A1 pulley secondary to the failure of smooth excursion of the tendon within pulley system of A1.³ This may be due to swelling inside the sheath as a result of a synovial inflammation or presence of a nodule in the tendon.³ Howard in 1953,⁶ described the procedure of corticosteroid injection in patient of trigger finger as an

effective treatment. It has then turn out to be an accepted first line treatment for this condition,⁶⁻⁸ because to its simplicity of use in clinic, the low risks of associated morbidity and very low complications associated with this procedure.⁹

We investigated the efficacy of steroid injection for triggering of finger at level of A1 pulley. We also investigated whether the efficacy of steroid injection is linked to the condition severity, nodule and the presence of general co-morbidities. Two most common co-morbidities are diabetes and osteoarthritis¹⁰⁻¹² associated with triggering digits. We use Green's classification,¹³ for the disease severity and also studied the efficacy of corticosteroid injections in the individual fingers.

Table 1: : Green's classification

Grade	History/examination
I	Pain/catching on & off
II	Catching demonstrable, actively extend
III	Catching demonstrable, passively extend
IV	Fixed/locked digit

Material and Method:

We retrospectively reviewed the records of patients who were treated with steroid injection for triggering of finger over a two years time from January 2014 to December 2016, presented to Department of Orthopedic and Spine Unit, Hayatabad Medical Complex, Peshawar. All patients with trigger finger above eighteen years of age were offered an injection at their first visit, regardless of duration of their symptoms or the severity of condition. Patients who had prior-corticosteroid injection or surgery in the trigger finger were excluded. Total of sixty eight fingers were included in our study in fifty two patients. There were 11 males and 41 females in our study, mean age of 54 years.

We found that the thumb (29 digits) was the most commonly affected finger, followed by the ring (23 digits), middle finger (10 digits), little finger (4 digits) and the index finger lastly (2 digits). Patients who had only a single trigger finger were 38 and 13 patients who were with multiple fingers involvement (10 patients with two digits, 2 with three digits and 1 with four digits).

At least a six weeks appointment was made after their procedure for all patients and one year telephone follow up was made after their procedure making sure that there was no relapse of condition.

Main focus of the study was on the steroid injection efficacy for treating of trigger finger. It also observed, whether the efficacy was interrelated to the severity of disease. We also graded the severity of the disease using Green's classification¹³ (Table 1). Patients presented with Grade I and II were designated as mild and III and IV were grouped into severe triggering.

The triggering of fingers was divided into two

groups, one with a diffuse swelling and second with a nodule. If patient had obvious well-defined rounded nodule at pulley (A1 pulley system) then they were grouped as nodular and the remaining were grouped as diffuse.

Trigger finger with co-morbidities were noted in order to see association with the efficacy of the steroid injections. There were 20 patients who had generalized osteoarthritis, involving any joint of patient,²¹ patients suffered from diabetes, with either insulin dependent or oral antidiabetic medications. There were no other co-morbidities to warrant any further examination.

All patients were injected with an injection of 2ml (40 mg/ml) of methylprednisolone acetate under sterile condition at the site of A1 pulley. Steroid was injected with a 22 gauge needle, into the flexor pulley sheath that the level of the proximal digital crease. The needle was introduced without ultrasound guidance, positioned at the base of the finger. Needle was inserted at a 45 degree angle and directed proximally in the direction of the A1 pulley. Post-injection no support or splint used and patient was advised to make use of the finger.

All patients were followed up for six weeks. On follow up, if patient had relief from triggering and symptoms, procedure was considered effective. If there is return of locking or pain had advised to come for follow-up. If the patient had no symptoms relieved or partially with first injection, they were advised a second steroid injection followed by another six weeks appointment. After the second injection if symptoms are not relieved then they were offered a final and third injection or release of the A1 pulley surgically. If third injection was also failed then patient were offered surgical release of A1 pulley

Results:

We found the overall efficacy for corticosteroid injections to be 72% (49/68). With the first injection there was a (33/68) 48% success rate. With the second injection this raised to 67% and 72% with the final injection (Figure 1). It is collective success rate of the steroid injections.

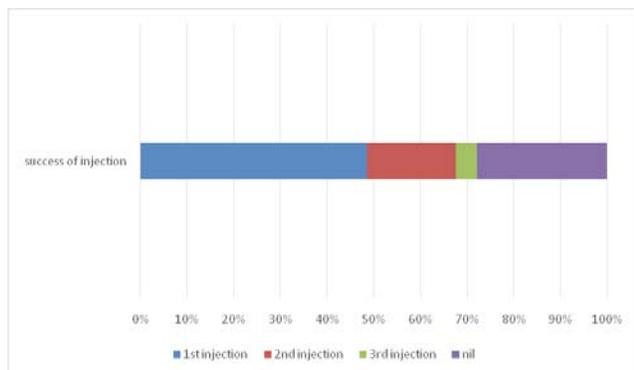


Figure-1. Bar graph showing the efficacy of each injection for treating trigger finger

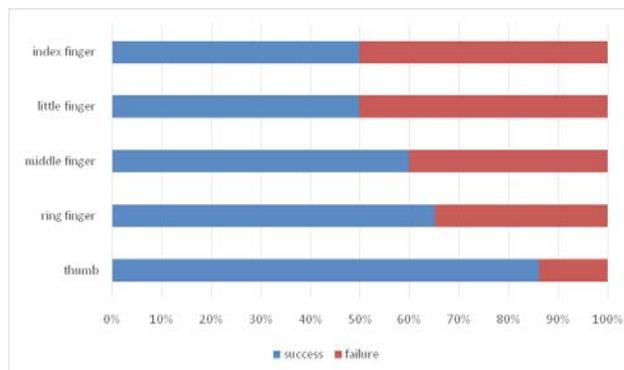


Figure-2. A Bar graphs showing the difference in success of the corticosteroid injection in treating different digits.

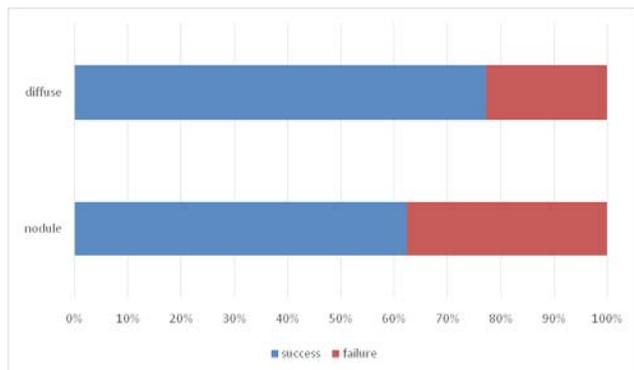


Figure- 3. A bar graph showing the efficacy of corticosteroid injection in treating diffuse and nodular patterns

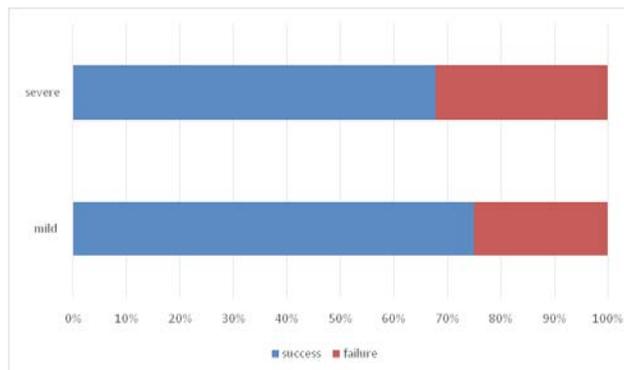


Figure-4. A bar graph showing the efficacy of corticosteroid injection in treating severe and mild digits.

Open or percutaneous release of the pulley was done on a total of 17 digits, while 02 patients with failed three injections refused surgical release because of their personal reasons or poor health.

Success of steroid injection was different depending on the digit being treated. Thumb had the best response to steroid injections, 25/29 (82%) success rate. Followed by the ring, middle, little, and lastly the index finger (Figure 2). Applying the Fisher exact test ($p = 0.001$) we found a statistically significant difference in the efficacy of steroid injection between the thumb and the other fingers.

We also found that the presence of anodule (clinically palpable) decreased success rate of steroid injection. Efficacy was observed to be 34/44 (77%) in finger with a diffuse pattern compared with a nodule 15/24 (62%) (Figure 3). However, this finding was not statistically significant (chi square test $p = 0.0853$).

Disease severity was graded using Green's classification.³ To increase the sample sizes we grouped patients with grade I and II were as mild and III and IV as severe triggering. With mild triggering, success of the steroid injection was 30/40 (75%), compared with 19/28 (67%) for severe (Figure 4). Digits which were not classified were not included in the study. We found decrease in the success in the different severities, but it was not statistically significant ($p = 0.521$).

We also found that patients with single finger affected had increased efficacy to injection as compared to those patients who had multiple fingers involvement. Effectiveness of injections was 30/38 (78.9%), with the single digit involvement compared with 19/30 (63.3%) with multiple fingers involvement. The efficacy appears to be better in patients with a single digit; however, statistically this was not significant ($p = 0.0923$).

The two most common co morbidities were

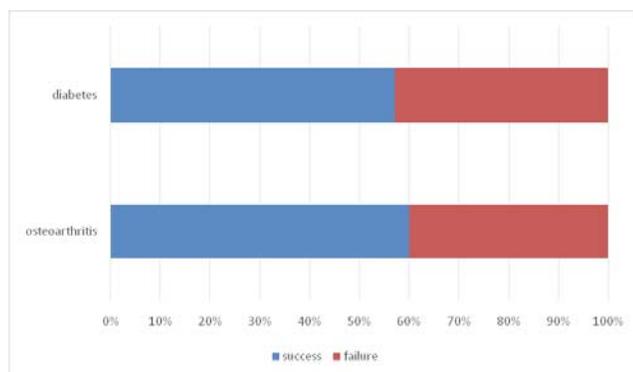


Figure- 5. A Bar graphs showing the difference in success of the corticosteroid injection in treating diabetes mellitus and osteoarthritis

documented and efficacy of corticosteroid injection was noted. We observed that there was a success rate of 12/21 (57%) diabetes patients and a rate of 12/20 (60%) with osteoarthritis (Figure 5). Patient with co-morbidities the efficacy was lower; however it was not statistically significant. ($p = 0.6065$ in diabetes and $p = 0.5992$ in osteoarthritis).

No complications were observed in this study with the corticosteroid injections.

Discussion:

Corticosteroid injection for treatment of trigger finger had an effective role as the first line treatment,^{14,15} because of easy administration, safe and economical.⁶⁻⁸ Surgical or percutaneous release had success rate of between 60%¹⁴ and 97%^{15,16} for the treatment of a trigger finger. But it is not free of complications. Associated complications are infection, tendon laceration, nerve injury, continuous pain, recurrence and contracture and stiffness of the proximal interphalangeal joint.^{9,17,18} Thorpe in 1988 studied the complications associated with surgical release and he reported 28% total complication rate after surgery.¹⁴ Surgical release is still definitive treatment in patients with recurrence or patient not responding to steroid injections.^{18,19}

Corticosteroid injection is an effective treatment for trigger finger. In literature its efficacy varies from 66% and 90%.^{20,21} Our study had a little lower efficacy of 72% with no complications observed.

We observed that corticosteroids injections can be offered up to three times in one finger safely. Nevertheless, we found that by final and third time efficacy overall is only increased by 5% (Figure 1). Patient with partial release with previous two injections were offered injection for third time.

In another study from the United States, it was observed that open release after failed two injections of steroid was most effective to be followed. We also found that it was greater than 9% then three injections followed by open release and would be more expensive.²²

We found that the efficacy of corticosteroid injection was different in different finger. 92% success rate was found in thumb which was highest, statistically significant as compared to other fingers. Our result was similar to Marks and Guntner's observations in 1989.²³ The increased effectiveness in thumb can be due to the placement of the corticosteroid, as needle in thumb is administered closer to the nodule than in other fingers.^{23,24} As in thumb the insertion of needle is near to nodule, described by the needle insertion technique, so this might be the reason that there are better results in thumb as compared to other finger. Secondly there is anatomical difference in the flexor pulley system of thumb and other fingers which might be the reason of better outcomes in thumb.

We found no correlation between the efficacy of steroid injections and nodule presence. In 1989, Freiberg et al.²⁴ observed that the clinical difference between diffuse trigger digits and nodular greatly affects the success of the corticosteroid injection in the treatment of trigger finger. According to them success rate was 48% of patients with a diffuse digits and it was 93% in patients with nodular trigger finger with first injection of steroid. We found the opposite, with a 72% success rate without nodular type and 56% with a nodule. Nevertheless, it was statistically not significant.

Literature on efficacy of corticosteroid injection with relation to disease severity is limited.

In 2006, Kazuki et al.²⁵ observed that less injection were needed for mild disease. We found decrease in the efficacy with severe disease. We also found decrease in efficacy in patients with multiple fingers as compared to single finger involvement but it was also statistically not significant.

In literature there is a relationship between triggering offinger and other diseases, such as de Quervain's, carpal tunnel syndrome, osteoarthritis, rheumatoid arthritis, diabetes mellitus and hypothyroidism.^{2,3,11} However, there is inadequate research into whether the efficacy of the corticosteroid injections have a relationship with those mentioned conditions. Diabetes is exception because there is decreased efficacy of steroid injection in diabetic patients.^{20,11} In our study 20 patients were with generalized osteoarthritis and 21 with diabetes. We found that success rate of the steroid injections was being reduced in both osteoarthritis (12/20) and diabetics (12/21). Diabetics with trigger fingers are more liable to have multiple fingers involvement and are more challenging to treat, and these patients are more likely to require surgical release with lower success rate. Diabetic patients have an abnormal cellular response to the corticosteroid injection as these patients had a poor micro vascular bed.¹¹

fortunately no complications is noted with steroid injection administration in flexor A1 pulley in the present study. A review of 11 studies revealed no serious complication in 1,246 digits for treatment of trigger finger with steroid injections.²⁶ However, complications reported with administration of corticoid steroid injection are tendon rupture,^{27,28} hypopigmentation of the skin⁵ and fat atrophy at the needle insertion site⁵ and digital necrosis.⁷ This emphasizes the proper administration of corticosteroid injection into the A1 pulleys system (flexor tendon sheath).

Conclusion:

We conclude that for treatment of triggering of finger steroid injection is an efficacious first-line treatment, especially in patient with triggering in the thumb. In our study total efficacy of cor-

ticosteroid injections for trigger finger was 72%. The success was statistically significant in thumb as compared to other digits. Nodule presence at site, condition severity at presentation and diabetes or osteoarthritis, all had decreased efficacy of steroid. Nevertheless, it was statically not significant as our sample size was not sufficient to reveal significant difference.

The success rate of a third injection require to be studied in a larger sample size, but we found that third injection did not significantly increase the efficacy of the steroid injection. we recommended that surgical or percutaneous release should be offered to patients with symptoms recurrence after two injections.

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Role and contribution of authors:

Dr. Abdul Waheed, FCPS, Assistant Professor, Department of Trauma and Orthopedics, Rehman Medical Institute, Hayatabad Phase V, Peshawar, Idea, data collection, and typing.

Dr. Aimal Sattar, FCPS, Registrar, Department of Trauma and Orthopedics, Lady Reading Hospital, Peshawar, Literature review and data editing.

Dr. Israr Ahmad, FCPS, Associate Professor, Department of Spine and Orthopedics, Hayatabad Medical Complex, Peshawar, Bibliography

Dr. Mohammad Arif Khan, FCPS, Professor and Head of Department, Orthopedic and Spine, Hayatabad Medical Complex, Peshawar, Review and editing

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