## ORIGINAL ARTICLE

# The Safety and Efficacy of Percutaneous Trigger Finger Release Under Local Anaesthesia

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**ABSTRACT:**

**Objective:**To determine the safety and efficacy of trigger finger and thumb released percutaneously with an 18 gauge needle under local anaesthesia.

**Materials and Methods:** This descriptive case series study was conducted at Orthopaedic and Traumatology Unit "A" Medical Teaching Institution(MTI) Lady Reading Hospital (LRH) Peshawar Pakistan from April 2014 to December 2015.All patients of trigger finger or thumb of either gender fulfilling the inclusion criteria were percutaneously released under local anaesthesia with the tip of an 18-gauge hypodermic needle.Post operative assessment of these patients was done weekly for a month and then monthly for 6 months. Clinical results were evaluated in terms of pain, activity level and patient satisfaction after 6 months at follow up and rated as excellent, good and poor.

**Results:**Thirty two fingers in twenty five patients with mean age 38.28 years±11SD (range 18 to 62 years) were included in the study. Post operatively excellent results were achieved in 90.9%(20/22) patients and good in 9%(2/22) patients at six months follow up. There were only 3(9.3%) failed releases requiring conversion to open release. There was no recurrence of trigger finger and no digital nerve nor tendon injuries reported.

**Conclusion:**Percutaneous trigger finger release under local anaesthesia is a safe and highly effective method for releasing trigger fingers. We recommend it as a treatment of choice for established trigger finger or thumb.

**Keywords:**Percutaneous release, Trigger finger, Tendon, Stenosing tenosynovitis, Local anaesthesia

## INTRODUCTION:

The term trigger finger for stenosing tenovaginitis or tenosynovitis of the tendon sheaths of flexor muscles of the finger was first proposed by French physician Alphonse Henri Notta in 1850 in his study of four cases of adult patients.[1,2] In recognition of Notta's discovery,a tendon nodule located on the volar aspect of the base of paediatric trigger thumb, mentioned in most studies is now commonly referred to as Notta's node.[3] Histopathologically, proliferatve thickening of flexor tendon sheath layer at the first annular(A1) pulley occurs resulting in narrowing of fibrous tunnel leading to tendon impingement when it moves through the narrow tunnel as the patient flexes and extends the affected finger.[3,4] Female patients in their fifth or sixth decades are more commonly affected than men and children rarely affected. It has a prevalence of about 2 percent in general population with diabetes, rheumatoid arthritis and amyloidosis are more prone to develop triggering.[3,5] The exact etiology of trigger finger in majority of cases is unknown[6] but certain occupations that involve constant gripping or repeated activities have been reported to be associated with more frequent triggering.[3] Thumb and ring finger is most commonly affected by triggering but it can involve any finger.[5] Various treatment options for trigger finger are injections of corticosteroid in the sheath of affected tendon[7] and percutaneous[8] or open [9] surgical release of the A1 pulley. In 1958 Lorthioir[8] first demonstrated A1 pulley release percutaneously in 52 patients with 100 percent success rate and no reported complications.A1 pulley release percutaneously with a hypodermic needle is a safe, quick, simple, economically feasible and highly effective technique with a short post-operative rehabilitation than open surgical release and can be performed as a day case or out-patient department (OPD) procedure.[10,11]The possible complications associated with open surgical release like infection,post-operative painful scar,A1 pulley tear resulting in bowstringing of flexor tendons, stiffness of interphalangeal joints and digital neurovascular injuries are minimal with percutaneous release.[12] The objective of this study was to evaluate the clinical results and safety of percutaneous trigger finger release under local anaesthesia in our set up.

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## MATERIALS AND METHODS:

This study was conducted in Orthopaedic and Traumatology Unit "A" Medical Teaching Institution (MTI) Lady Reading Hospital(LRH) Peshawar Pakistan

from April 2014 to December 2015. All Patients of trigger finger or thumb of both gender and Quinnell's[13] grades IV and V (Intermittent locking but actively correctable and complete locking but only passively correctable respectively) were recruited from the outpatient department for this study. All patients had painful finger or thumb flexion and extension and triggering was clearly observed in all patients.Children with trigger fingers, patients of rheumatoid arthritis, previous flexor tendon repairs and patients having bleeding disorders were excluded from the study. The study protocol was approved by the hospital ethics committee and informed written consent was taken from all the participants of the study. Complete history and physical examination and X- rays of affected finger or thumb were done in all the included subjects. Under local anaesthesia in the outpatient department, the tip of an 18-gauge hypodermic needle was used to divide the A1 pulley percutaneously. Post operative assessment of these patients was done weekly for a month andthen monthly for 6 months. The clinical results were evaluated in terms of pain, activity level and patient satisfaction at 6 months follow up and rated as excellent, good and poor according to Grundberg's[14] rating system (Table1). Statistical analysis of the data was done with SPSS (version 16). Frequency and percentages were used for categorical or qualitative variables such as gender. Mean ± Standard Deviation (SD) was used for numerical or quantitative variables such as age (in years).

**Operative Technique:**

The procedure was performed in the outpatient department (OPD) as day case surgery. The position of the patient for the procedure was supine with forearm supinated and trigger finger in extension. Affected finger and hand was scrubbed with povidone iodine solution. About 1 ml of plain lignocaine was injected into the skin overlying the A1 pulley. To prevent injury to the digital artery and nerve during the procedure, we utilized the safe anatomical landmarks as the tubercle of the scaphoid bone and the midpoint of proximal palmar crease for the A1 pulley release in the little finger while the radial side of pisiform bone and midpoint of proximal palmar crease was used for index finger A1 pulley release. [15]The middle and ring fingers were released through midpoint of distal palmar crease[16] while the metacarpophalangeal crease was used as a starting landmark for trigger thumb release in all cases.[17] To avoid damaging digital arteries and nerves during the procedure the metacarpophalangeal joint is hyper extended so that the tendon gets closer to the skin and with neurovascular bundle falls to the side of the tendon.An 18 gauge hypodermic needle tip was inserted over A1pulley and divided in one clean stroke.The disappearance of grating sensations confirmed that the pulley was completely cut.After the procedure, the patient was instructed to flex and extend the finger a few times and a dressing was applied over the area. Post procedure nonsteroidal anti- inflammatory drugs were prescribed for three days in all cases.All the patients were advised weekly follow up visits for a month and then monthly for six months for assessment of any recurrence,pain, wound infection, digital stiffness etc.

**RESULTS:**

Thirty two fingers in twenty five patients with mean age 38.28 years±11 (range 18 to 62 years) were included in the study. Nine(36%) patients were male while 16(64%) were female. The frequency of fingers or thumb involvement among our patients is shown in Table 2. Nine(36%) patients(12 fingers) were diabetics.A total of six (18.7%) fingers had failed a trial of treatment by steroid injection at least once before percutaneous release. Eighteen (56.2 %) fingers were Quinnell's Grade III while 14(43.7%) were grade IV on initial admission. Post operatively excellent results were achieved in 90.9%(20/22) patients and good in 9%(2/22) patients while no poor result was recorded at six months follow up. There were only 3(9.3%) failed releases requiring conversion to open release at first follow up visit and all the three (thumb, index, little finger) were Quinnell's Grade IV diabetics and had previously failed steroid injection. In all three patients, intra-operative observation revealed incomplete release of the A1 pulley. There were no signs of digital nerve or artery injury nor was thereany significant tendon injury in any of these patients. The mean operative time was 12 min (9-15), including the local anaesthesia of the patient. There was no recurrence of triggering. Range of motion was preserved in all cases. There was no wound infection, hematoma formation,digital nerve ortendon injuries reported in our study.

Table: 1
Grundberg's rating system to evaluate clinical outcome

| Rating | Pain | Activity and patient satisfaction |
|---|---|---|
| Excellent | No pain<br>Returned to work or activity | Patient satisfied |
| Good | Pain only with heavy use<br>Returned to work or activity | Patient satisfied |
| Poor | Pain unchanged | Patient dissatisfied |

Table: 2
Frequency of fingers or thumb involvement among our patients

| Finger | Side of trigger finger/thumb | | Total |
|---|---|---|---|
| | Right | Left | |
| Thumb | 4 | 2 | 6(18.7%) |
| Index | 4 | 1 | 5(15.6) |
| Middle | 8 | 3 | 11(34.3) |
| Ring | 6 | 1 | 7(21.8) |
| Little | 3 | 0 | 3(9.3%) |

**DISCUSSION:**

Percutaneous release of trigger finger is easy to perform, economically feasible with excellent results and minimal complications and is therefore preferred than open surgical release.[18]Our study yielded excellent results in majority (90.9%) of patients and good in other( 9%) patients whileno poor result at six months follow up. Other studies also reported that percutaneous release alone gave excellent functional results.[10,19] Our results of release are therefore comparable with those reported previously by other authors. Mishra [20]used the tip of 20 gauge hypodermic needle for percutaneous release of 27 trigger fingers and reported 95.4% excellent results with no recurrence or complications. They concluded that percutaneous release has a very high success rate and is a safer technique with a very few documented complications rather than open release. Similarly Dahabra[21] used 18 gauge needle tip for A1 pulley release and reported a success rate of 92.8% while failure in only 3(7.2%) fingers. Forty six trigger fingers were percutaneously released by Sahu[11]and excellent,good and poor results were noted in 82.6%(38/46),13.0%(6/46) and 4.3%(2/46) patients respectively at final follow up visit, by taking into account post op pain, patient activity and satisfaction. In our study no post procedure complications like digital nerve or flexor tendon injury, recurrence, wound sepsis and hematoma formation were reported and this was due to the fact that we carefully utilized the established guidelines for the precise anatomical recognition of the pulleys for needle placement and aseptic technique in each and every case. Ha[17]percutaneously released 185 trigger fingers with no complications noted while Gilbert [22] reported sensory loss on the radial side of the thumb in 3 (1%) patients. Fu[23] reported persistent or recurrent triggering symptom in 4% of his patients. Guler[24] reported an incidence of about 5.7% of digital nerve injury in his series of trigger thumb release and he therefore advised precise anatomical surface markings or use of ultrasound for trigger thumb release.For trigger thumb he suggested open surgery rather than percutaneously.

There were only 3(9.3%) failed releases in our study requiring conversion to open release at first follow up visit. All the three (thumb, index, little finger) were diabetics and had previously failed steroid injection as well. These cases with incomplete release were among the first cases in our series. Our last 29 fingers were completely released. Our inability to release trigger finger in a few cases might be due to our anxiety about the proximity of digital neurovascular bundle with hypodermic needle placement site or learning curve for the procedure as the surgeon's skill [25] is of utmost importance for a successful and complication free trigger finger release.Furthermore all the failed cases were diabetics and as Ryxewicz[9] noted that hyperglycemia leads to fibrosis and possibly tenosynovitis which is not only resistant to cure but also has a very high rate of recurrence and therefore requires early open surgical release rather than percutaneous release.Small sample size was the one of the limitations of our study.Although our study had fewer number of cases however but we achieved excellent results in majority of trigger finger and thumb release percutaneously. Further an analysis was not made based on a comparison with other methods of anesthesia and surgical techniques or steroid injection, because the study would then be more difficult and costly than the present. We believe that percutaneous trigger finger release is a very useful technique and we recommend continued study over its long-term effects.

**CONCLUSION:**

Percutaneous trigger finger release is a safe and highly effective technique. Utilizing precisely the safe anatomical landmarks we found it safe for all the fingers including the thumb, index finger and little finger. It is a quick and less invasive technique and can be done as a day care procedure in the outpatient department(OPD).It is easy to perform, economically feasible to all patients, has no major complications and allows the patient to return to his daily activities and work quickly. This technique produced excellent results in majority of our patients. We recommend it as a treatment of choice for established trigger finger or thumb.

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