ORIGINAL ARTICLE

ANNALS OF PUNJAB MEDICAL COLLEGE

Clinical Results of Trigger Finger Release with Percutaneous Needle Technique Under Local Anesthesia

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Submitted for Publication: 14-05-2024
Accepted for Publication 29-03-2025

How to Cite: Shahid S, Inam K, Ahmad W, Ali I, Naseer MK, Masood F. Clinical Results of Trigger Finger Release with Percutaneous Needle Technique Under Local Anesthesia. APMC 2025;19(1):58-61. **DOI: 10.29054/APMC/2025.1614**

ABSTRACT

Background: Trigger Finger (or trigger thumb) is because of mechanical impingement at the level of the A1 pulley and affects 2-3% of the general population and 10% of the diabetic population. It causes progressive pain and locking of the digit which often requires surgical release when conservative treatment fails. **Objective:** To assess the outcomes of trigger finger release using percutaneous needle technique. **Study Design:** Prospective interventional study. **Settings:** Orthopedic Department of King Edward Medical University/ Mayo Hospital Lahore, Pakistan. **Duration:** Six months from July 2023 to December 2023. **Methods:** A total of 32 patients with 19 women and 13 men were included in the study. Biodata and basic information were recorded and disease was graded according to Green Classification. Patients were called to the operation theatre on an outdoor basis and percutaneous release of the A1 pulley was performed using an 18-gauge needle under local anesthesia after obtaining informed written consent. Immediately After the procedure, the finger was assessed functionally using Quinell's criteria and for pain using Visual Analogue Scoring (VAS). All patients were followed for three months after the release. **Results:** The Technique was successful in all the 32 patients (100%). No patient was found with recurrence during the initial three months of follow-up. One-third of the patients had excellent outcomes while two-thirds had good outcomes according to Quinell's grading system. No patient had a poor outcome. **Conclusion:** Percutaneous release of the trigger finger with the needling technique is an easy, time-saving, resource-saving technique and minimally invasive approach. It also reduces the risk of post-operative wound infection in the diabetic population.

Keywords: *Trigger finger, Stenosing tenosynovitis, Percutaneous release, A1 pulley.*

INTRODUCTION

In trigger finger or stenosing tenosynovitis, there is painful locking of a finger, making it difficult to straighten or bend smoothly. This disease can markedly influence the quality and daily routine work of an individual.[1] Its symptoms include pain and discomfort, functional limitation like limited/restricted fine motor movements of the finger, and reduced productivity. Trigger finger, also known as stenosing tenosynovitis, is a condition characterized by the painful locking of a finger, which impairs smooth bending and straightening movements. This disorder significantly impacts an individual's quality of life and ability to perform daily activities. The primary symptoms associated with trigger finger may include pain and discomfort which the patients experience when attempting to move the affected finger, functional limitations: (The condition restricts fine motor movements of the finger, making it challenging to perform tasks requiring dexterity), reduced productivity (due to the pain and limited finger mobility, individuals may experience decreased efficiency in work-related tasks and daily activities), difficulty in straightening or bending (the affected finger may become locked in a bent position, requiring manual manipulation to straighten it), Stiffness (patients may notice increased stiffness in the affected finger, especially in the morning or after periods of inactivity) and clicking or popping sensation (When

attempting to move the finger, individuals may feel or hear a clicking or popping sensation as the tendon moves through the constricted sheath). These symptoms can vary in severity and may be progressively worse if left untreated, further impacting the individual's ability to perform routine tasks and maintain their usual level of productivity.[2]

The condition can affect all age groups with variations observed among different demographics but it usually occurs in patients ages ranging from 50 to 84 years.[3] The ring finger is the commonest to be involved. The middle finger is the second most commonly affected followed by the index finger, and little finger.[4] The ring finger and thumb are particularly susceptible due to Biomechanical factors (These digits experience higher levels of stress during gripping and grasping activities), anatomical considerations (The flexor tendons of these digits have a more complex arrangement within the tendon sheath), and Usage pattern (The ring finger and thumb are frequently involved in repetitive tasks and forceful gripping). It's important to note that the trigger finger can affect multiple digits simultaneously, and the prevalence may vary based on individual factors such as occupation, age, and underlying health conditions like diabetes mellites.

The condition can be treated with different approaches including conservative treatment options like nonsteroidal anti-inflammatory drugs, steroid injections, splinting, and surgically by the open or percutaneous release of the A1 pulley.[5] Of the two techniques reported success is 50-90 % in conservative treatment while 100% with surgical treatment with some complication reported in open surgical releases like infection, digital nerve injury, scar tenderness, etc., and no complication reported with percutaneous release.[6]

Percutaneous release was first performed about six decades ago, and it has become the treatment of choice in patients reluctant to conservative treatment.[7] The procedure is easy to perform, having negligible complication rate and high satisfaction rate of patients.[8] The rationale of our study was to assess the effectiveness of the minimally invasive percutaneous needle technique in the release of the trigger finger.

METHODS

This study was conducted in the Orthopedic department of King Edward Medical University /Mayo Hospital Lahore Pakistan between July and December 2023. Approval from the Institutional Review Board (IRB) was taken vide notification number 411/RC/KEMU dated 02.10.2023. A total of thirty-two patients meeting the inclusion criteria were operated using the percutaneous technique. Patients above 18 years with triggering symptoms were included in the study. Those with already established deformity, on anti-coagulants, and a previous history of surgery on the affected finger, were excluded from the study.

Comprehensive assessments were conducted both initially and during follow-up in the outpatient department (OPD). Post-operatively, the Southampton Scoring System[9] was applied to assess the presence of infection, while the pain was assessed using the Visual Analogue Scale (VAS).[10]

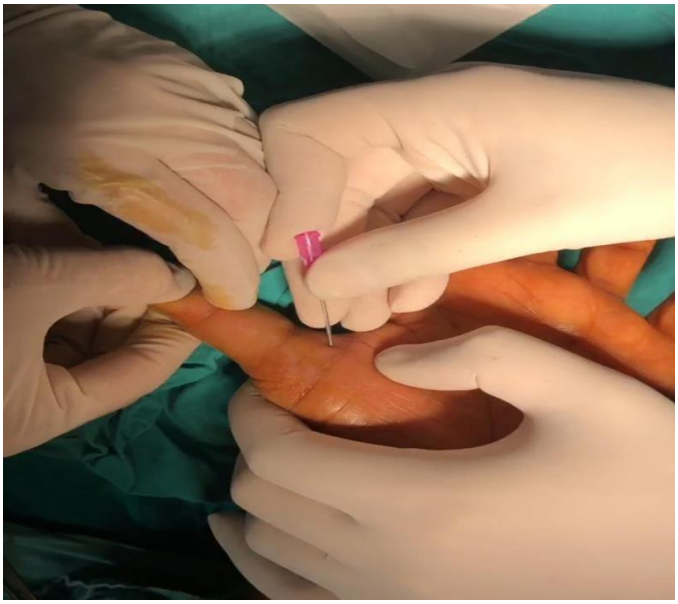
Surgical Technique: Patients who met the inclusion criterion were selected through the outpatient department of the Orthopedic unit of the King Edward Medical University/ Mayo Hospital Lahore. Informed written consent was taken from every patient or his/her attendants.

After aseptic measures, local anesthesia was administered. Then an 18-gauge needle was introduced into the center of the metacarpophalangeal joint. Special attention was given to keeping the bevel of the needle parallel to the long axis of the flexor tendon. The patient was asked to flex and extend the distal phalanx with which the needle was also moving. This confirmed the location of the needle in the substance of the flexor tendon. The needle was inserted in the A1 pulley rather than the flexor tendon itself. Therefore, the needle was gently withdrawn back till it was no longer moving with flexion and extension of the finger to target the A1 pulley. Then, the needle was moved vertically from the proximal portion to the distal portion of the longitudinal axis on the flexor tendon, and the grating sensation was felt, this confirmed the A1 pulley was located correctly below the needle.

Once the location of the needle tip was confirmed, the needle was moved to cutting the A1 pulley till there was no more grating sensation felt. This point indicated that the A1 pulley had been cut and fully released. On this occasion, patients were asked to flex and extend the digit to make sure that the triggering was relieved. After the procedure was completed, an aseptic dressing was done the area was compressed for three minutes to prevent hematoma formation.[11] (Figure 1).

Postoperative Care: After the procedure, all the patients received a prescription of non-steroidal anti-inflammatory drugs for three days. Various complications, including infection, digital neurovascular injury, recurrence, or stiffness at the surgical site were monitored. No complications were noted. Weekly follow-ups were conducted for one month, followed by monthly check-ups for three months, during which the patients were evaluated and functionally assessed as per Quinell's criteria.[8]

Figure 1: Technique of percutaneous release of trigger thumb



RESULTS

Of the 32 patients selected in the study, 19 (59.3%) were females and 13(40.7%) were males. The right hand was involved in 21 (65.4%) while the left hand was in 11(34.6%) cases. Dominant hand was involved in 24 (75%) of patients while nondominant hand in 8 (25%) of patients. The most common presenting symptom was locking in all 32 (100%) cases while pain was also complained by 7(21.8%) patients. Duration of symptoms ranged from 5 months to 16 months (mean of 10.6 ± 4.1). The most commonly involved finger was a thumb in 17 (53.12%) of patients. Ring finger was involved in 9 (28.1%), middle finger in 5 (15.6%), and index finger in 1(3.1%) patient (Table 1).

Table 1: Pattern of different fingers involved

Total cases (n)	32
Thumbs	17 (53%)
Ring finger	9 (28%)
Middle Finger	5 (15.6%)
Index finger	1 (3%)

The age of patients varied from 32 years to 71 (45.9 ± 9.3) years. The most common comorbidity was diabetes Mellites in 14 (43.7%) of cases, followed by Rheumatoid arthritis 4 (12.5%) and carpal tunnel syndrome 2 (6.25%) of patients. 12 (37.5%) patients had no comorbid conditions.

Four patients (12.5%) were classified as per Green's classification as grade 1, 11(34.3%) as grade 2 and 17 (53.1%) as grade 3.

All patients were operated by a single team of surgeons. All 32 patients (100%) had relieved their triggering at the end of the procedure. There was no immediate post-op complication in any patient. Postoperative pain was slight in 5(15.6%) patients, mild in 14(43.7%), moderate in 10 (31.25%) and severe in 3 (9.3%) patients.

Postoperatively, functional assessment was done using Quinell's grading system for patient satisfaction and pain relief. 11 (34.6%) patients had excellent outcomes while 21 (65.4%) had good outcomes. No patient had a poor outcome (Table 2).

Table 2: Patient satisfaction and pain control

Obtained Result	No of patients (Percentage)
Excellent	11 (34.6%)
Good	21 (65.4%)

Regarding post-operative infection, there was Southampton grade 1 healing in 2 (6.25%) patients while all other patients (93.7%) had normal healing.

DISCUSSION

Nearly two third of the patients were females and about half of the patients were diabetic. One-third of the patients had no predisposing factor. The ring finger was the most commonly affected in more than half of these patients. More than half of the patients had grade-three disease at the time of presentation.

The success rate was one hundred percent in terms of relief from triggering and there was zero immediate post-operative complication. One-third of the patients had moderate post-operative pain. The postoperative function was good in two-thirds and excellent in one-third of patients. No patient had an infection after the procedure.

Our obtained results were similar to Marij Z *et al*.[12] who also found this technique 100 % effective in terms of release from triggering. Our result is also comparable to Ghazey *et al*.[13] who found the procedure to be effective in 95% of cases. However, Prasad Chaudhari *et al*.[14] reported the procedure to be successful in 81% of patients. In this procedure, digital nerve preservation is a challenge. Staying in the midway line prevents digital nerve injury. The procedure is of significant value in patients with uncontrolled diabetes in whom wound healing in the open release of the A1 pulley is a big concern. The procedure is time-saving and is preferred in patients who want an early return to their jobs and it markedly decreases the burden on the hospital in terms of admission as the procedure can be safely performed as a daycare case and avoids any scar formation.

CONCLUSION

We observed that percutaneous release of the trigger finger is a safe, effective, quick, and reliable method that can relieve symptoms of the patients such as pain and triggering immediately. This procedure can be done on an OPD basis in the doctor's office.

Further, it does not require a very experienced surgeon to carry out the procedure. So, in our opinion before going for open surgical release for the trigger finger, a percutaneous trial should be offered to the patient as the first option.

LIMITATIONS

1. Our sample size was less, we suggest trials in the large population sample.
2. Our follow-up time was only three months, so longer follow-ups are required to establish any idea about its recurrence.

SUGGESTIONS / RECOMMENDATIONS

We recommend further clinical trials with a larger sample size to validate the results of this study.

CONFLICT OF INTEREST / DISCLOSURE

All the authors declare that there were no conflicts of interest.

ACKNOWLEDGEMENTS

This research work was facilitated and supported by the Department of Orthopedic Surgery of Mayo Hospital Lahore.

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