

# Percutaneous release of trigger finger without local anaesthesia as an outpatient procedure

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## Abstract

**Background:** Stenosing tenosynovitis or trigger finger frequently involves the thumb and ring fingers of the dominant hand and more commonly seen in adult female population, in their 5th and 6th decades of life. **Method:** In this study, 18-gauge needle was used for the percutaneous release of trigger finger without any local anaesthesia in 12 patients with prior consent. **Results:** Highest numbers of patients were in 41-60 years age group (66.7%). 3 patients (25%) belong to 20-41 years age group. Only 1 patient (8.3%) of age group 61-80 was affected by trigger finger. 7 Patients (58.3%) were females and 5 patients (41.6%) were males. The most commonly affected finger was the ring (58.3%) followed by the middle (33.3%) and index (8.3%). Right hand and left hand was affected side in 8 (66.6%) and 4 (33.3%) patients respectively. According to greens classification, Grade II patients were 50%, grade III 41.6% and grade IV 8.3%. Average duration of the procedure was 5-7 minutes. There was no evidence of complications. 4 patients experienced mild postoperative pain. In one patient the procedure has to be abandoned as patient could not tolerate the pain. **Conclusion:** As we do not use local anaesthesia localization of A 1 pulley in trigger finger is much easier for percutaneous release. Therefore, the procedure is more effective and time saving as well.

**Keywords:** Percutaneous release, Trigger Finger, Stenosing tenosynovitis, Without local anaesthesia

## Introduction

Stenosing tenosynovitis commonly known as trigger finger is a common disorder of hand in adults which can cause pain, swelling and locking sensation in the affected finger. It frequently involves the thumb and ring fingers of the dominant hand [1]. It is more commonly seen in adult female population (~F: M=4:1), in their 5th and 6th decades of life [2]. The lifetime prevalence of trigger fingers among nondiabetics is approximately 2.6% [3].

The primary pathology is thickening of the A1 pulley with resultant entrapment of the flexor tendon, thus forming a triggering mechanism [4]. With this pathology of size mismatch between the flexor tendon and the first annular (A-1) pulley, catching or locking of finger occurs during the flexion. If left untreated, this may cause flexion contracture of the proximal interphalangeal joints [5]. The main treatment option of trigger finger in early stages is conservative

management. Steroid and local anesthetic injection, and splint application are recommended in the acute stage [6-10]. Conservative treatment involves a high failure rate, requiring repetitive injections [11-12]. When conservative treatment fails; open release of the A1 pulley is recommended [12-14]. In diabetic patients trigger finger often is less responsive to conservative measures. Lorthioir was the first person to describe percutaneous release technique using a thin tenotome [15]. Various methods using several instruments were reported afterwards [16-20].

In this study, we used an 18-gauge needle for the percutaneous release of trigger finger without any local anaesthesia in cooperative patient with prior consent. We treated 12 patients of trigger fingers with this method as an outpatient procedure. Satisfactory results were obtained in 11 patients. Infiltration of local anaesthesia obscures the local anatomy around the pulley. There has not been any study in the English literature to our knowledge involving percutaneous trigger finger release without local anesthetic agent

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previously. Hypothesis was made that our technique would result in much more accurate localization of A -1 Pulley which would decrease the time and cost. We therefore recommend this convenient, quick and cost-effective outpatient procedure with a low complication rate with prior consent in cooperative patients. In this small series in selected patients, the procedure was well tolerated by patients.

**Methods**

**Place of study:** J.K. Hospital associated with L.N. Medical College Bhopal (M.P.).

**Type of study:** Prospective study

**Sampling method:** Consecutive

**Sample collection:** 12 adult patients with diagnosis of trigger finger were recruited between July 2018 to May 2019 and treated by percutaneous release technique without local anaesthesia. We first counsel the patient and explain exactly what the procedure entails in greater details, including risks and benefits of procedure without local anaesthesia and the informed consent was obtained.

All surgeries were performed in the same manner, at the same facility and by the two surgeons. All the relevant details of patients were tabulated using detailed proforma.

Details of patients like age, sex, type of affected finger, side of upper limb, timing of procedure and complications were recorded. Initial diagnosis of trigger finger was made on the basis of detailed history and clinical examination. In all the cases who given the consent for the procedure without local anaesthesia, this procedure was carried out. All the relevant data were compiled on master chart.

**Inclusion criteria:** Only adult patients with trigger finger of either sex, who given the consent for procedure without any anaesthesia were included in the study. All the patients had single trigger finger involvement.

**Exclusion Criteria:** Patients who refused this procedure without local anaesthesia were excluded from this study. Early stage patients with grade I of Greens classification of trigger finger were also excluded from study as these patients are usually treated with conservative management. Patients with trigger thumb were also excluded due to possible risk of digital nerve injury. Patient with more than one trigger fingers

involvement in the same hand were excluded from the study.

**Statistical Methods:** Results were shown in tables, comparing their numbers and percentages by scientific calculator.

**Ethical Permission:** Yes

**Procedure:** This procedure was carried out in the outpatient department. Palmer skin was cleaned and the digit was hyperextended. To facilitate the hyper-extension of involved digit, a small sterile folded towel was kept under the hand which makes it easier to palpate and localize the A 1 Pulley.

This pulley is along the distal transverse palmer crease opposite the metacarpophalangeal joint of the digit. Clear understanding of the location of the A1 pulley is key to successfully performing a percutaneous trigger release. An 18-gauge hypodermic needle tip is inserted through the skin at the proximal extent of the A1 pulley and into the flexor tendon.

Needle placement is confirmed by observing the paradoxical movement of the needle on gentle flexion of the digit. The needle tip is then withdrawn until it is no longer in the flexor tendon. With the bevel of the needle in the flexor sheath, the pulley is divided by a gentle but firm lifting action, from distal to proximal.

Complete release is ensured at the end of the procedure by asking the patient to flex and extend the finger and was found to be moving freely without triggering or any restriction in finger extension. Because no incision is made, no stitches are needed after the procedure.

Pressure dressing is applied at the puncture site and the patient is advised to keep hand elevated for next 24 hours. Patients were also advised to use night splint for next two weeks.

This is particularly important in patients where the patients has grade IV locked trigger finger. Patient was then seen next day to change the pressure dressing to a simple local adhesive dressing. Patient was then seen in a week's times to remove the dressing.

Subsequent follow-up for 3 months was arranged. All patients were reviewed at 3 months and subjective and objective assessment was made for patient's satisfaction and for and local complications or recurrence of symptoms respectively.

## Results

The aim of this study is to find out the efficacy of this percutaneous trigger finger release technique using 18 gaugeneedle without any local anaesthesia. After analysis of the patient's data, following observations and results were obtained.

**Table-1: Age wise distribution.**

Age group (years)	Number of patients	%
20-40	3	25
41-60	8	66.7
61-80	1	8.3
	12	

A total of 12 patients with 12 trigger fingers were included in present study. Highest number of patients belonged to 41-60 years age group (66.7%). 3 patients (25%) to 20-41 years age group. Only 1 patient (8.3%) of age group 61-80 was affected by trigger finger in the study.

**Table-2: Sex wise distribution.**

	Number of patients	%
Male	5	41.6
Female	7	58.3
	12	

About 7 (58.3%) were females and 5 (41.6%) were males.

**Table-3: Type of affected finger.**

	Number of patients	%
Index finger	1	8.3
Middle finger	4	33.3
Ring finger	7	58.3

The most commonly affected finger was the ring finger followed by the middle finger and index. No patient in our study presented with little finger stenosing tenosynovitis. Patient affected with more than one trigger finger were excluded.

**Table-4: Side of upper limb with affected finger.**

	Number of patients	%
Right	8	66.6
Left	4	33.3

Right hand (66.6%) was most common affected side. Left hand was affected in 33.3% patients.

**Table -5: Greens classification.**

		Number of patients	%
I	Pain/history of catching	0	0
II	Demonstrate catching, but can actively extend the digit	6	50 %
III	Demonstrate locking, requiring passive extension	5	41.6%
IV	Fixed flexion contracture	1	8.3%

In our study, trigger finger was classified according to Green classification [2]. Grade II patients were 50%, grade III 41.6% and grade IV 8.3%.

**Table-6: Outcome and complications.**

	Number of patients	%
Successful release	11	91.6%
Incomplete release	1	8.3%
Postoperative pain	4	33.3%

All the pts were reviewed at 3 months after the procedure. There was no evidence of digital nerve injury, flexor tendon injury, stiffness of the finger or infection and recurrence. The patients were also inquired about the postoperative pain, 4 out of 12 patients experienced mild postoperative pain lasting for 24 hours. Of the 12 patients, 1 patient had no benefit with this technique as the patients could not tolerate the pain during the procedure resulting in incomplete release of pulley. This patient was operated with percutaneous release under local anaesthesia successfully.

## Discussion

Trigger finger is characterized by the thickening of the tendon sheath and the A1 pulley and sometimes nodule formation on the tendon together with luminal narrowing [21]. The condition has a reported annual incidence of 28 cases per 100 000 population, or a lifetime risk of 2.6% in the general population [22]. This rises to 10% in patients with diabetes [23]. Secondary trigger finger can be seen in patients with diabetes, gout, renal disease, rheumatoid arthritis and other rheumatic diseases and is associated with a worse prognosis after conservative or surgical management [24, 25].

Primary trigger finger occurs most commonly in fifth to sixth decades of life and up to 6 times more frequently in women than men [26-29]. The present study also suggests the middle-aged peoples (41-60) as a most common group (66.7%) with female predominance (58.3%).

All digits can be affected, but the ring finger is most often involved, followed by the thumb and the long, index, and little fingers, in that order [30-31]. More than one trigger digit can be present on the same hand. Triggering of digits in both hands is also common. Present study also shows the ring finger as most commonly affected digit.

Percutaneous release of the A1 pulley in 25 cadaveric study by Pope (1995) revealed full release and resolution of triggering in 90% of the specimens [32]. Their observation was that the radial digital nerve was within 2–3 mm of the needle site and suggested that percutaneous techniques should not be used in trigger thumb. Therefore in the present study, trigger thumb release was excluded percutaneously in our short series. Several other authors have also indicated that the relative volar position of the digital nerves in the thumb closer to A1 pulley. This clearly increases the risk of

injury to digital nerve with close percutaneous technique [33]. Right hand which is dominant side (66.6%) was most common affected side in our study. Left hand was affected in 33.3% patients. Patients with trigger finger were classified according to Green classification [2]. Grade I patients who presented with pain and history of catching, were the good candidate for conservative management, therefore were excluded from present study.

Grade II patients who demonstrated the catching, but can actively extend the digit were 50%. Grade III patients who demonstrated locking, requiring passive extension were 41.6%. Grade IV patients with fixed flexion contracture were 8.3%. Similarly Niraj ranjeet et al also reported 16 patients (53.3%) with grade II, 12 patients (40%) with grade III and 2 patients (6.6%) with grade IV [34].

Conservative treatment of trigger finger which includes injections of steroids, local anesthetics and splint application, is the most commonly used treatment for grade I trigger finger. In patients who did not benefit from conservative treatment, percutaneous release or open surgery is usually recommended.

Bain et al. recommended percutaneous release operation for active and movable trigger fingers and discouraged application of this procedure for locked fingers or those with tenosynovitis [35]. However in our short series we had one patient with grade IV locked ring finger of two months duration. This patient was successfully operated with our technique.

The percutaneous release procedure developed by Eastwood et al. has been popularized with assertions favoring its ease of application and lower cost and complication rates [36]. Percutaneous release is most commonly performed under the local anaesthesia and

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with ultrasonography guidance which needs the facility of ultrasonography equipment and availability of radiologist. In the present study, all the cases were performed without local anaesthesia and without sonographic guidance that makes the procedure to be time saving outpatient procedure.

Average duration of the procedure in our study was 5 to 7 minutes. In our technique, we did not use local anesthetic agent therefore clinical land marks and local anatomy was not obscured and was easier to precisely localize the A1 pulley with tip of the needle for percutaneous release which facilitated the procedure to be done in shorter time.

Several techniques for percutaneous release of the A1 pulley have been described with satisfactory results [15, 20,28,36]. Advantage of percutaneous release technique avoids the time and expense of an open procedure with the few complications. Percutaneous release technique although, has been practiced by many plastic and orthopedic surgeon, but still there is a reluctance by some surgeons due to the fear of injuring the digital nerves and vessels and the chance of having incomplete release of A1 pulley.

The possible complications of percutaneous release are the risks of digital nerve injury (hypoesthesia), damage to unseen tendon tissue, delayed tendon rupture, painful scar and recurrence remains with this technique but this risk is much less than with open surgery [37].

In the present study, there was no evidence of digital nerve injury, flexor tendon injury, stiffness of the finger or infection. 4 patients complained of mild postoperative pain. In 11 patients (91.6%) patients, this technique without anaesthesia was successful and only one patient had no benefit with this technique as the patients could not tolerate the pain during the procedure resulting in incomplete release of pulley. This patient was operated with percutaneous release under local anaesthesia successfully.

This study clearly shows the effectiveness of close percutaneous release without local anesthetic agent with no significant complications.

All patients tolerated the procedure well. We knowingly selected a small series of patient to test our hypothesis regarding tolerability of the procedure without any anesthetic agent, its effectiveness and the complications. We recommend this procedure in selected cooperative patients as it is safer, more effective, time and cost

saving procedure. This study needs to be replicated with a larger series before extrapolating and generalizing its findings.

**Conclusion**

Trigger finger is a mechanical problem caused by a mismatch between the relative size of the flexor tendon and A1 pulley. Appropriate treatment is based on understanding of the exact anatomic localization of pulley. Because of precise localization of pulley, we conclude that our technique of percutaneous trigger finger release without local anaesthesia is effective, can be performed with ease, speed and safety in outpatient clinics in selected patients.

**What this study adds to existing knowledge?**

There has not been any study in the literature to our knowledge involving percutaneous trigger finger release without local anesthetic previously. The present study reports this study of percutaneous trigger finger release without using local anesthetic agent with an 18-gauge needle. This was a very effective and result oriented technique. As the sample size of this study is small, more research work needs to be done in a much larger series with longer follow-up in the future to establish its efficacy.

**Author's contribution**

**Dr. Ram Kripal Soni:** Formulated the aims & objectives with study design and supervised for study

**Dr. Vikas Kumar Malviya:** Preparation of the manuscript and Data analysis.

**Conflict of interest:** None declared.

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