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FUNCTIONAL OUTCOME FOLLOWING PERCUTANEOUS RELEASE OF TRIGGER FINGER IN A TERTIARY CARE CENTRE

Orthopaedics

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ABSTRACT

Background: Trigger finger is a common clinical disorder caused by irritation of the flexor tendon as it slides through the fibro-osseous sheath and characterized by pain and catching as the patient flexes and extends digits because of disproportion between the diameter of flexor tendons and the A1 pulley. Its surgical options include open and percutaneous minimally invasive methods. **Methods:** A prospective study was conducted in Gauhati Medical college and Hospital over the course of 4 months in which 23 patients aged 23-66 years presenting with trigger finger were treated with percutaneous release. Percutaneous trigger finger release of A1 pulley was done with the help of 18G hypodermic needle under local anaesthetic cover as a day care procedure. Subsequently the patient was followed up at 1 week,3 weeks and 2 months. Outcome was assessed by level of satisfaction, complications, days to resume work and complications **Results:** All patients were completely resolved of their symptoms with no serious complications. 3 patients had temporary wound related complications which was resolved in 3 days .2 patients had temporary stiffness which resolved completely within a month. **Conclusion:** Percutaneous release of trigger finger is effective, convenient, cost effective day care surgery without any significant complications and presents a suitable alternative to intralesional steroids

KEYWORDS

Trigger finger; percutaneous; operative; daycare

INTRODUCTION

Trigger finger is a condition in which either clicking or symptomatic clicking on flexion or extension of the thumb occurs. It was first described by Notta in the year 1850. [1]. The condition is caused by inflammation and constriction of the retinacular sheath through which the flexor tendons run as they pass from the palm of the hand into the finger.[2] The inflammation and constriction leads to differences in the diameter of the flexor tendons of the fingers and the fibro-osseous canals in which those tendons lie that ultimately results in the limitation of the tendon function which is necessary for hand movement.

When the finger is flexed, catching, or locking occurs.[3] The retinacular sheath is composed of five annular "pulleys" which hold the tendon close to the bone. Constant irritation of the tendon results in the formation of a nodule that impinges on the pulley, causing pain as well as restricting movement.[2] The series of cruciform and annular pulleys present in each digit serves to maximize the flexor tendon's force and efficiency of motion. The A1 pulley, at the level of the metacarpal head, is the first part of the sheath and is subjected to the highest force. Therefore, triggering usually occurs at the A1 level.[2]

Trigger fingers are mostly idiopathic. They are commonly seen in middle-aged woman and in conditions such as diabetes mellitus, rheumatoid arthritis, hypothyroidism, amyloidosis, gout, hypertension and neoplasms.

Treatment may be conservation with splint immobilization, nonsteroidal anti-in inflammatory medication, steroid injection, and physiotherapy. But a lack of reliability of conservative modes of treatment of trigger finger has led to the search for surgical modes of treatment.[4,5,6]

Open surgical release of A1 pulley is generally done when conservative treatment fails but is associated with complications such as infection, stiffness, scar tenderness, bowstringing and digital nerve injury especially radial digital nerve injury can occur.[7]

Trigger digit can also be released percutaneously using a fine tenotome. This procedure is easy to carry out and has been associated with less complications. However, this convenient OPD based cost effective method with a low complication rate has not been studied very well in our setup. Therefore, we aim to study the functional outcome following percutaneous release (PR) for trigger finger in our setup i.e., a tertiary care centre in North East India.

MATERIALS AND METHODS

This observational study was carried out in Guwahati Medical College and Hospital, a tertiary care hospital in rural India over the course of four months. Institutional ethics committee approval was obtained prior to conducting the study and informed written consents were obtained from all participants. Patients aged 18 to 65 years of all genders, belonging to American Society of Anesthesiologists (ASA) grade 1,2 or 3 physical status coming to the Orthopaedics OPD of Guwahati Medical College and Hospital with symptomatic trigger finger with locking or on movement or presence of tender nodule were included for the purpose of the study. Patients who refused to give consent, those with uncontrolled diabetes mellitus or those who had active infection at the incision site, those with significant coagulopathies or having other previous hand surgery or other hand pathology such as rheumatoid arthritis, osteoarthritis. A total of 27 patients presented with the condition, out of whom 3 refused to give consent, one had active infection at incision site, and one had uncontrolled diabetes. These patients were subsequently excluded from the study.

A total of 23 patients (18 female and 5 male) underwent percutaneous release of trigger finger at Gauhati Medical College and Hospital from September 2022 to December 2022. The diagnosis was made clinically with tenderness, swelling and locking being the usual presentation. Preoperatively blood glucose level was estimated to rule out uncontrolled diabetes mellitus. The patients were graded according to Quinnell's criteria for assessment of preprocedural severity of the involved finger :

Grade	Clinical findings (during flexion and extension)
0	Normal movement
I	Uneven movement
II	Actively correctable
III	Passively correctable
IV	Fixed deformity

Figure 1: Quinnell's Criteria

Under all aseptic and antiseptic conditions all the patients underwent percutaneous release of trigger finger in our minor OT as a day-care procedure. Post operatively the patients were prescribed NSAIDs and oral antibiotics twice a day for 3 days with rest and local application of ice.

The patients were followed up at 1 week, 3 weeks and 2 months . The outcome was assessed by:

1) level of satisfaction (very satisfactory, Satisfactory, unsatisfactory),
2) complications,
3) Days to resume work,
4) Range of motion.

Percutaneous technique

We placed the patient in supine position with the shoulder abducted by 45° with the volar surface of the trigger fingers facing the ceiling. To achieve proper extension at the MCP joint, hand and wrist were placed on the pillow. Proper cleaning and draping was done and under aseptic conditions 2 ml of 1% lidocaine was infiltrated locally. The finger was then hyperextended which brought the flexor tendon sheath directly under the skin and an 18G needle was inserted at a 1-2 mm distal to the metacarpophalangeal joint crease directed parallelly along the longitudinal axis of the tendon. The location of needle was confirmed by the movement of the needle on flexion and extension of the distal phalanx. If the needle moved it was retracted until it was out of the flexor tendon and in the A1 pulley and the movement stopped. A grating sensation could be felt on sliding the needle from proximal to distal direction on the longitudinal axis of the tendon which confirmed the correct location of the pulley. This movement is continued until there was no further grating sensation which indicated complete release of the pulley. Once the pulley was released completely, the patient was asked to flex and extend the digit to confirm relief from the symptom of triggering. After the procedure, a compression dressing was applied for 24 hrs to prevent hematoma. The patients were prescribed non-steroidal anti-inflammatory drugs and oral antibiotics for 3 days with rest and local application of ice.

Follow up was done at 1 week, 3 weeks and 2 months

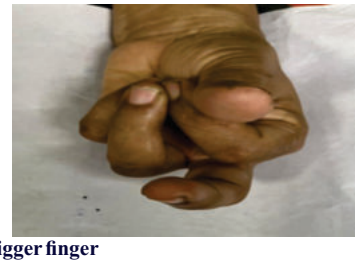

Figure 2: Trigger finger

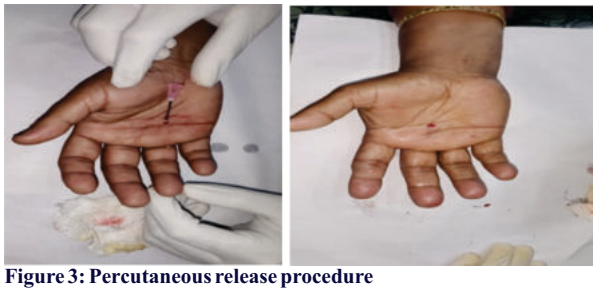

Figure 3: Percutaneous release procedure

Statistical Analysis:

Data was analysed using Statistical Package for the Social Sciences (SPSS) version 21.0 (IBM SPSS Corp, USA) software. Numerical variables were presented a mean with standard deviation, Median (IQR), and categorical variables were presented as frequency (%).

RESULTS

Out of 23 patients, 18 patients (78.26%) were female and 5 (21.74%) were male. All patients had involvement of a single digit. 16 (69.56%) were of the right side and 7 (30.43%) of the left.

The mean age of patients was 43 years (23-61). These patients were followed-up at 1 week ,3 weeks and at 2 months and graded according to Quinnell's criteria. 82.6% (19/23) patients were of grade I, 13.04% (3/23) patients of grade II and 4.3% (1/23) patients was of grade III. In all the cases the procedure was uneventful and there were no significant complications. All trigger finger patients were instantly relieved of triggering/ catching and of pain was relieved in an average of 5 days. Average time of resumption of work was 3 days. We did not encounter any major complication within a follow up period of 2 months.

Only few minor complications occurred. 3 patients had temporary wound related complications which was resolved in 3 days .2 patients had temporary stiffness which resolved completely within a month.

All these minor complications were relieved at follow-up in the 3rd week. The average time taken for the procedure was 4 minutes. All patients were discharged after 1 hour of observation.

Table 1: Clinical features at presentation

CLINICAL FEATURE	NUMBER OF DIGITS(%)
1. PAIN WITH NODULAR SWELLING	10(43.47%)
2. CATCHING/ SNAPPING/ LOCKING	13(56.52%)
3. CONTRACTURE	0

Table 2: Grading of the trigger finger at presentation

GRADE:	NUMBER (%)
GRADE :1 PAIN AND NODULARITY	82.6% (19/23)
GRADE :2 SELF CORRECTABLE TRIGGERING	13.04% (3/23)
GRADE :3 MANUALLY CORRECTABLE TRIGGERING	4.23% (1/23)
GRADE :4 IRREDUCIBLE CONTRACTURE	0

Table 3: Demographic data of the study subjects

PATIENT CHARECTERISTIC	NUMBER (%)
MEAN AGE	43 YEARS
MALE: FEMALE	05:18
DOMINANT/NON-DOMINANT HAND	16:07
DIGIT INVOLVED	
1. THUMB	3
2. INDEX	10
3. MIDDLE	3
4. RING	7

Table 4: Objective outcome, subjective outcome, and associated complications at the end of 1st week, 3rd week and 2nd month

OUTCOME	DAY 7	3RD WEEK	2ND MONTH
OBJECTIVE OUTCOME			
1.SATISFACTORY	23(100%)	23(100%)	23(100%)
2.UNSATISFACTORY	0	0	0
SUBJECTIVE OUTCOME			
1.VERY SATISFACTORY	15(65.21%)	15(65.21%)	15(65.21%)
2. SATISFACTORY	8(34.78%)	8(34.78%)	8(34.78%)
3. UNSATISFACTORY	0	0	0
COMPLICATIONS			
1.PAIN	5 (21.74%)	0	0
2.ERYTHEMA	3(13.04%)	0	0
3.INFECTION	0	0	0
4.RECURRENCE	0	0	0
5.STIFFNESS	2(8.7%)	0	0
6.WEAKNESS	0	0	0
7.NERVE DAMAGE	0	0	0
8.PAINFUL SCAR	0	0	0
DAYS TO RESUME WORK			
1.WITHIN 2 DAYS	6	0	0
2. WITHIN (3 -10 DAYS)	17	0	0
3. > 10 DAYS	0	0	0

Figure 4: Results of percutaneous release at the end of 2nd month

DISCUSSION

We observed 23 patients fulfilling the inclusion criteria in this prospective study. Patients were counselled beforehand about the temporary discomfort they would face during the procedure and proper consent obtained. All the patients tolerated the procedure well.

Objectively, all the patients had satisfactory outcome at the end of first week itself and this satisfaction with the outcome persisted even at the end of the second month. Eastwood et. al [8] in 1992 first reported percutaneous release of A1 pulley using a 21 G needle with success rate of 94% in 35 trigger digits. Issam A. Dahabra et. al [9] in their study on 42 patients with trigger finger reported satisfactory results in 39 cases (92.8%) in which fingers were completely free from triggering.

Subjectively, 65% of patients found the procedure very satisfactory and 35% of them found it satisfactory. Sahu RL et al. [10] in their study on 46 patients with trigger finger treated with percutaneous release reported excellent results in 82.6% (38/46) patients, good in 13.0% (6/46) patients and poor in two 4.3% (2/46) patients respectively. There was complete pain relief was achieved in 82.6% (38/46) patients, partial pain relief in 13.0% (6/46) patients and no pain relief in 4.3% (2/46) patients just after surgery with no recurrence of triggering. Likewise, Mittal et al. [11] in a study on 100 patients treated with percutaneous release of trigger finger reported 83 patients had an excellent result, 13 had a good result and the remaining 4 had a poor result.

5 patients (21.74%) complained of pain in the operative site in the first follow-up visit at the end of the first week, while 3 of them(13.04%) had erythema in the site. 2 patients (8.7%) complained of stiffness of the phalanx. All these complaints resolved on the second follow-up visit at the end of the 3rd week and no patients had any complaints at the end of the 2nd month. Similar to the findings of our study, a study by Rawat P et al [12] found that 58 trigger finger patients treated with percutaneous release reported 100% success rate with only minor temporary complications. In their study, 7(10.29%) patients had pain and 10(14.70%) patients had erythema and swelling beyond a week. Farooq et al [13] in their study on 150 trigger finger patients treated with percutaneous release reported 92.6% showed full range of motion and resolution of symptoms at 6 weeks.

6 patients in our study resumed their day-to-day work within 2 days while the rest of them (17) resumed work within the first 10 days. The return to activities of daily living was excellent and rapid with percutaneous release. Similarly, Phatak et al .[14] in a study on 30 trigger finger digits treated with percutaneous release reported a success rate of 97%, with one case presenting as incomplete symptom resolution, which needed open complete release of the pulley. There was no case of infection, nerve injury and bowstring effect after percutaneous release.

Even though our study has shown excellent results with percutaneous release of trigger finger, our sample size was limited. Larger multicentric trials will perhaps be needed to establish percutaneous release as the standard of treatment for trigger finger.

CONCLUSION

Percutaneous needle release of trigger finger is easy and safe. With proper technique there are minimal complications. It is a definitive, reliable, and reproducible procedure which is also economic and can be performed as a one-time outpatient procedure.

Ethical Consideration: Institutional Ethics Committee(H) permission obtained prior to study commencement.

Other Informations

Protocol:

Passed by Institutional Ethics Committee(H) NO.GMC/EC/PG2073

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Conflict of Interest: None

Declaration Of Sources Of Funding: None

Declaration Of Conflict Of Interest: None

Ethical Approval: NO./GMC/EC/PG2037, INSTITUTIONAL ETHICS COMMITTEE (H) of Guwahati MEDICAL COLLEGE, DIBRUGARH

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