



Clinical and functional outcomes of trigger digits managed by percutaneous release in adult population: A prospective study

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Abstract

Purpose of the study: Trigger finger is a common cause of hand pain and dysfunction resulting from a narrowed tunnel for tendon excursion. In this study, we aimed to evaluate clinical and functional outcomes of percutaneous release in the management of trigger digits.

Patients and Methods: This prospective study was conducted on 60 patients in the Orthopaedics Department GMC, Srinagar. The patients were treated by percutaneous release using an 18 gauge needle and followed up for a minimum period of 6 months. Patients were observed for recurrence, range of motion, tendon rupture, digital nerve injury and patient satisfaction.

Results: Mean age in our study was 43.6 years, females predominated our study, thumb was found more commonly involved than other digits. There was complete release of A1 pulleys in 58 out of 60 patients (96.6%), recurrence observed in 4 patients. Patients were evaluated using Roles and Maudsley score and VAS score.

Conclusion: Percutaneous release is safe and cost effective alternative method for management of trigger digits with excellent functional outcome and rapid recovery with minimal complications.

Keywords: Percutaneous release, Trigger digits.

Introduction

Trigger fingers are among the most common pathologies affecting the hand, and thus, among the most common complaints treated by the hand surgeon⁽¹⁾. It is a stenosing flexor tenosynovitis of the fingers and thumb as a result of repetitive use⁽²⁾. Trigger finger is one of the common causes of pain and disability of the hand^(3,4). This condition results in painful catching or popping of the involved flexor tendon⁽⁵⁾ as the patient flexes and

extends the digit. On occasions, the digit will lock in flexion and require passive manipulation of the digit for full extension. Basically tendon entrapment is due to mechanical impingement of the digital flexor tendons as they pass through a narrowed A1 pulley at the level of the metacarpal head⁽⁶⁾. Quinell grading of triggering⁽⁷⁾ is - Grade 0 - Mild crepitus in the non-triggering digit, Grade 1- No triggering, but uneven digit movements, Grade 2 - Triggering is actively correctable, Grade

3 - Triggering is usually correctible passively by the other hand, Grade 4 - the digit is locked. Multiple modalities have been utilized to address this problem including rest and splinting, steroid injections, and operative release. Although some patients may benefit from steroid injection alone, diabetics have shown poorer response to conservative measures with a failure rate of 34%⁽⁸⁾. This rate causes some clinicians to advocate for early surgical release.

Surgical release has traditionally been performed in an open manner. However, percutaneous release of trigger digits has been proven to be safe and effective^(8,9). Multiple percutaneous techniques exist: tactile versus ultrasound guided and endoscopic blade versus needle based^(10,11). Regardless of the technique utilized, percutaneous release has proven to have similar equivalency to open release^{12,13}.

Percutaneous trigger finger release is simple and effective with success rates of 84% to 100% at the mid-term follow up^(14, 15).

Patients and Methods

This prospective study was conducted at Orthopaedics Department GMC, Srinagar. A total of 60 patients were included in the study, Inclusion criteria were- Any adult of age more than 18 years with Quinell grade I – III, Consent for participation in the study and Exclusion criteria were- Age < 18 years, Uncontrolled diabetes mellitus, hypertension and immunosuppressive diseases, Coagulation disorder, Fixed flexion contracture, Fixed trigger finger (Quinell grade IV), Rheumatoid arthritis. The purpose, procedure, risks and benefits of the study were explained to the patients and a formal written consent was taken. Patients were followed regularly and final assessment was done at 6 month

Procedure

Patients were investigated with complete haemogram with platelet count, random blood sugar and bleeding time and clotting time. X ray of the affected hand with fingers in antero-

posterior, lateral and oblique views were taken. Pre-operative Roles Maudsley score was assessed. The surface landmarks of the A1 pulley were marked. These are located at the proximal palmar crease for the index finger, halfway between the proximal and distal palmar creases for the middle finger, the distal palmar crease for the ring and little fingers, and the metacarpophalangeal crease for the thumb. Proper painting and draping of the affected hand was done All patients underwent percutaneous release with 18 gauge needle in the out-patient department under all aseptic precautions. No antibiotics were given prophylactically.

After checking sensitivity of lignocaine, the procedure was done under local anesthesia. The local anesthetic comprised of a 2% solution of Lidocaine with adrenaline, infiltrated with a long 25 gauge needle over the volar surface of the distal palmar crease of the affected digit. Then, using an 18 gauge needle, the A1-pulley was released in a proximal to distal stroking motion with the sharp edge of the needle, usually requiring one to two sweeps with resultant release of the A1-pulley. This resulted in an immediate relief of symptoms of pain and catching. 1 ml of triamcinolone mixed with 1ml of 2% lignocaine without adrenaline was infiltrated around A1 pulley. No suturing required in any patient and sterile dressing was applied and patient allowed to return to normal activity. In the post-procedure period all patients were asked to move their fingers actively as required. Patients were followed up at 1st week, 3rd week, 3rd month and 6th month after procedure. At each follow up visit, Patients were observed for recurrence, range of motion, tendon rupture, digital nerve injury and patient satisfaction -and at 6 month VAS score and Roles and Maudsley score were recorded .

Results

Following results were observed while treating 60 patients with trigger digits by percutaneous release

Table 1: Distribution of cases by age

Age (years)	No. of cases	Percentage
18-30	3	5%
30-40	13	21.7%
40- 50	21	35%
50 -60	18	30%
>60	5	8.3%

Maximum patients were in age group of 30 -60 and mean age in our study was 43.6 years.

Table 2: Distribution of cases by sex

Sex	No. of cases	Percentage
Female	39	65%
Male	21	35%

Table 3: Distribution of cases by side

side	No. of cases	percentage
Right	38	63.3%
left	22	36.75

Right hand was found more commonly involved than left hand

Table 4: Distribution of cases by digit involved

Digit	No. of cases	Percentage
Thumb	29	48.3%
Index finger	16	26.7%
Middle finger	13	21.7%
Ring finger	2	3.3%
Little finger	-	-

Thumb was found the most commonly involved digit followed by index finger and middle finger.

Table 5: Functional grading by using Roles and Maudsley score

Level	Pretreatment	Post treatment at 6 month
Excellent	No	50
Good	2	7
Acceptable	9	3
Poor	49	-

Maximum patients showed significant improvement in Roles and Maudsleys score from poor to excellent.

Table 6: Functional grading by VAS

VAS Scale	Pretreatment (no. of Cases)	At 3 month	At 6 month
0 -3	8	8	9
3 -6	14	42	42
6 -10	38	10	9

Patients showed improvement from mean score of 7 to 5.6 and 5.8 at 3 months and 6 months of follow up respectively.

Table 7: patients showing improvement in trigger finger grading (Quinell’s Criteria)

Quinell grading	Pre-operative	Post-operative at 6 month
Pain and nodularity	5	-
Triggering self-correctable	23	2
Triggering manually correctable	31	2
Irreducible	2	-

Maximum patients showed significant improvement in finger triggering.

Table 8: Complications

Complication	No. of cases	Management
Recurrence	4	Open release
Stiffness	1	Physiotherapy and local steroid injection
Hypoesthesia/ digital nerve injury	1	Improved by Conservative treatment
Tendo rupture	2	Tendon repair

Discussion

Trigger finger is common cause of pain and hand disability characterized by pain, catching, triggering and decreased range of motion. Trigger finger results from thickening of the flexor tendons of fingers (stenosing flexor tenosynovitis) or nodule formation. Basically tendon entrapment is due to mechanical impingement of the digital flexor tendons as they pass through a narrowed A1 pulley at the level of the metacarpal head. Open surgical release of the A1 pulley through a small palmar incision is a simple procedure, with a success rate of up to 100%^[18]. However the major disadvantage of open damage complication rates of 7–28%, have been reported. Infection, digital nerve injury, finger stiffness, hand weakness, scar tenderness and bowstringing of the flexor tendon can all occur^[19]. Percutaneous release of the A1 pulley avoids a potentially painful palmar incision and can be performed as OPD Procedure. Lorthioir was the first describe a technique of subcutaneous release of the A1

pulley using a fine tenotome passed through the skin. He reported good results in 52 digits^[20].

In our study mean age was 43.6 years and maximum patients were found in age group of 30-60 years. Females predominated our study, right hand was found more commonly involved and thumb most commonly involved digit which was similar to other study. In our study almost all patients showed significant improvement in VAS score and Roles and Maudsleys score. Most complication was recurrence which was managed by open release.

The percutaneous surgical release technique performed by Eastwood *et al*⁽²¹⁾ is a convenient, minimally invasive, economical method with a very low complication rate, and is becoming more popular than open surgery. Mohsen 21 in his study, reported 97% success rate of percutaneous release in 40 trigger digits, the thumb being the most common digit, similar to our study which showed 100% successful release and the thumb was also the most common digit involved.

Sahu *et al* reported successful results in 95.6% patients (excellent in 82.6% and good in 13%)⁽²²⁾. Ramy analyzed a study of 42 patients in which he reported incomplete release of A1 pulley in three fingers 6.97% and superficial flexor tendon laceration in six fingers (13.95%)⁽²³⁾. Mishra *et al*⁽²⁴⁾ reported a case series of percutaneous release of trigger fingers with the tip of 20 gauge hypodermic needle in which they reported success rates of 95.4%, with no recurrence and concluded that the procedure was safe and effective with lower complication rates compared to open surgery, comparable to our study. In the study by Zyluk *et al*, at the final assessment at 6 months, six recurrences (11%) were noted in the group treated by steroid injection (59 digits) and none in the group treated operatively (46 digits) with $P = 0.005$ ^[25]. Blumberg *et al*, in their study of 29 patients with 31 trigger digits were treated by percutaneous release. One patient was lost to follow up, and the remainder were examined at a mean follow-up of 14 months. One patient (one thumb) experienced recurrent symptoms, and

required an open release^[26]. Bain *et al*. recommended percutaneous release operation for active and movable trigger fingers and discouraged application of this procedure for locked fingers flexion contracture⁽²⁷⁾.

Conclusion

Our study showed that percutaneous release of trigger finger is safe, cost effective out-patient procedure with minimal complications.

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