

Original Research Article

Percutaneous trigger thumb release: a safe push-pull technique

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ABSTRACT

Background: Stenosing tenosynovitis of the thumb is an inflammation of flexor tendon sheath of A1 pulley. Percutaneous release has recently gained popularity. Successful percutaneous release depends upon proper prediction of the location of the A1 pulley and circumventing injury to the neurovascular bundles. The aim of this study was to determine the safety of percutaneous release of trigger thumb.

Methods: Twenty eight patients were included in the study between 2015 and 2018. All the patients were percutaneously released using push-pull technique. Steroid injection was given following the release. Quinnell grading, patient questionnaire and visual analogue scale score was used to assess the patients at 2 weeks, 6 weeks and 6 months and 1 year.

Results: Satisfactory results were found in 93% of patients. Two patients complained of pain and swelling till third week. No digital nerve injury occurred in any patients.

Conclusions: Percutaneous trigger thumb release using this push-pull technique is a simple and a safe technique with very minimal complications.

Keywords: Stenosing tenosynovitis, Percutaneous release, Neurovascular injury, Push-pull technique

INTRODUCTION

Trigger thumb is non-infective inflammation of the flexor tendon sheath of thumb.¹ The tendon passes through a fibro-osseous tunnel between the metacarpal and phalangeal bones. Inflammation of this tunnel occurs due to repetitive use thereby preventing smooth gliding of the tendon under the A1 pulley.¹ This constriction can cause locking. Thumb differs from other fingers in such a way that neurovascular bundles are more central making them more prone to injury during percutaneous release.² Of the several methods of treating trigger thumb, percutaneous release has recently gained popularity due to its ease, low complications and high patient satisfaction. In this study

we aimed to evaluate the safety of percutaneous release of trigger thumb using push-pull technique.

METHODS

It is a prospective study done in Sri Ramachandra Institute of Higher Education and Research between 2015 to 2018. Twenty eight patients were included in the study. Selection criteria were patients with trigger thumb, presence of a nodule, age more than 50 yrs. Exclusion criteria were patients who have undergone previous procedures for trigger, who had rheumatoid disease, patients with recent trauma, history of cancer or tumor. Quinnell grading system was used to assess the severity

pre-operatively (Table 1).³ All patients were in either grade II or III. The procedure was done in OPD.

Table 1: Quinell grading for pre-operative assessment.

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

Surgical technique

18 G needle was used for the percutaneous release. Under strict aseptic precautions, 2 ml of 2% lignocaine was injected in the subcutaneous tissue and tendon sheath (Figure 1 and 3).⁴ Needle was inserted just distal to metacarpophalangeal joint crease with the thumb held in hyperextension facilitating the flexor tendons to become more subcutaneous. The needle position was checked by flexing and extending the thumb and slightly withdrawn until it stopped moving while flexing passively. The release was made with push-pull technique (Figure 4). The needle was pushed and thumb was pulled alternatively. Grating sensation was felt while release. Complete release was confirmed with the absence of grating sensation and full range of motion of thumb without triggering. 20 mg of triamcinolone was injected into the tendon sheath (Figure 5 and 6). A small dressing was applied. The procedure time was between 10 to 15 minutes.

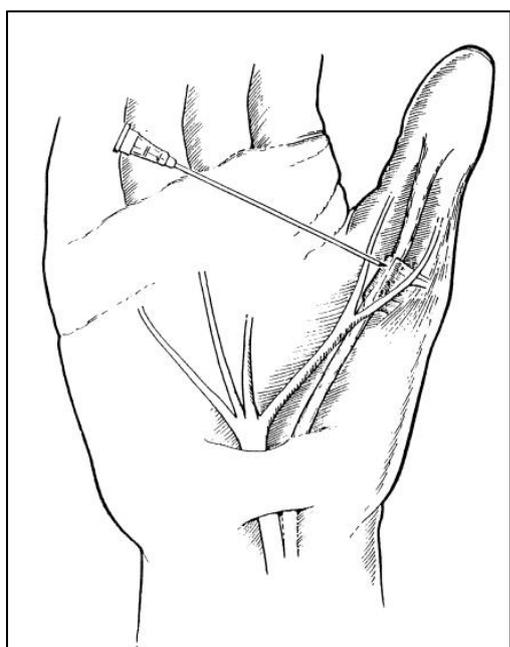


Figure 1: Localisation of A1 pulley.⁴



Figure 2: Clinical picture of a trigger thumb.



Figure 3: Injecting lignocaine in tendon sheath.



Figure 4: Inserting 18 G needle just below the MCP crease.



Figure 5: Injecting triamcinolone in flexor tendon sheath.



Figure 6: After trigger release.

Post-operative assessment

Patients were advised anti-edema measures for 3 days. Full range of motion of thumb was encouraged immediately after release. They were assessed postoperatively with functional questionnaire and visual analogue scale (VAS) (Table 2).⁴

Table 2: Functional questionnaire by Gilberts et al.⁵

Questionnaire for functional evaluation
Do you have triggering?
Do you have pain?
Do you have stiffness in the digit?
Do you feel numbness of the digit?
Do you see a scar?
Are you dissatisfied, satisfied or very satisfied with the results of the treatment?

RESULTS

Of the 28 patients included in the study, 10 were male and 18 were female (Figure 7) and between age groups of 50 to 65. Of these 2 patients had bilateral hand involvement. Pre-operatively all 28 patients had trigger and stiffness and 26 patients had pain (Figure 8). Post-operatively 26 patients had no symptoms and full movements of thumb without any triggering. Two patients had pain and swelling which persisted for three weeks. By Quinnell’s grading, preoperatively 20 patients were in grade II and 8 patients in grade III (Figure 9). Functional evaluation using questionnaire by Gilbert’s et al showed that 26 patients were satisfied and 2 patients were dissatisfied (Figure 10).⁵ The mean VAS was 3 (range 2–6). No patients had numbness or scar. Patients were again assessed at 6 weeks and their mean VAS was 2 (range 0–4). 93% of patients had satisfactory outcome and 7% had unsatisfactory outcome. All patients were going to work, doing their household activities without any difficulties. They had their follow up on their 6th month and end of 1 year and had no symptoms. No digital nerve injury was found in any of the patients.

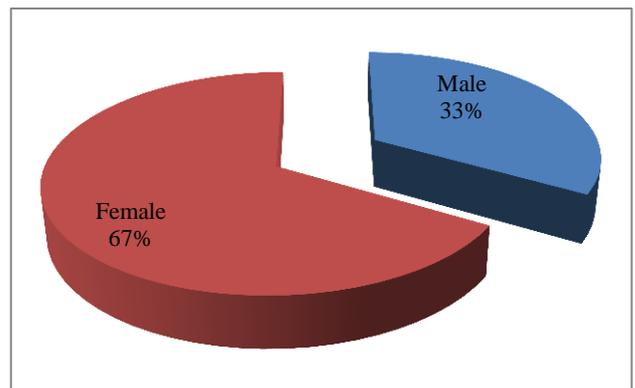


Figure 7: Sex distribution.

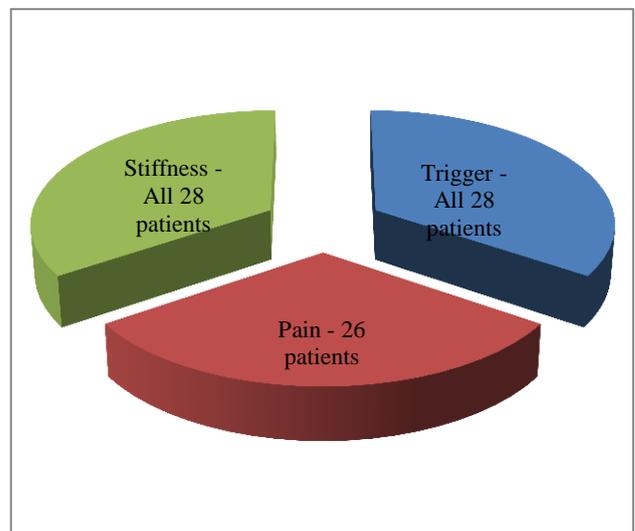


Figure 8: Clinical characteristics.

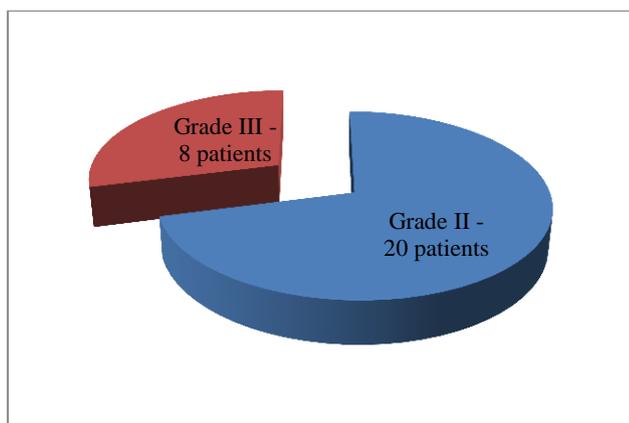


Figure 9: Quinnell's grading of patients

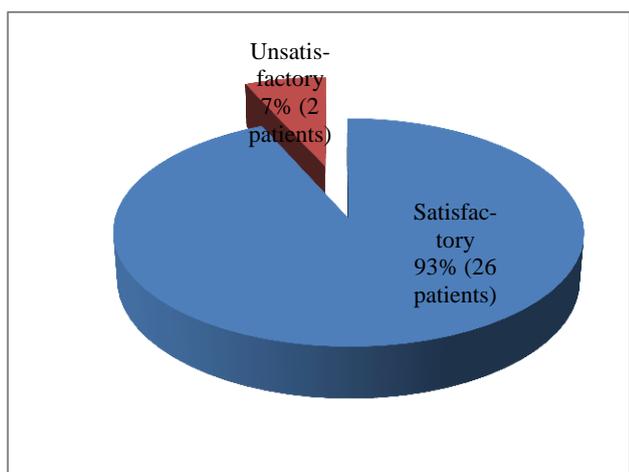


Figure 10: Outcome using Gilbert's questionnaire.

DISCUSSION

Trigger finger is an inflammatory condition of the flexor tendon sheaths.¹ Triggering commonly involves the dominant hand. A nodule develops at the A1 pulley which produces pain, swelling and locking at flexed position.¹

Management of trigger thumb varies from non-operative to operative treatment. Steroid injections into tendon sheaths have reported varying success. Quinnell and Rhoades et al, with their study has demonstrated success rate of steroid injection as 38% and 55% respectively.^{3,6} Open release of A1 pulley is associated with complications like scar tenderness, digital nerve injury and bow stringing of flexor tendons.⁷⁻⁹

Percutaneous release of the A1 pulley using tenotome was described by Lorthoir in 1958 and many studies have described about using needle for percutaneous release. Various authors have reported neurological injury during percutaneous release for trigger thumb.¹⁰⁻¹⁴ This is because of the anatomic variation of the digital nerve which courses obliquely proximal to the A1 pulley.¹⁴

In pressure-push technique described by Joseph et al, the needle was inserted proximal to distal, centered over the midline of the interphalangeal crease.¹⁵ In this technique the digital nerve was found more proximal to needle insertion circumventing the injury to the nerve. This technique was used in our study for percutaneous release. Postoperative complications like stiffness, neurovascular injury, bowstringing of flexor tendons was described in some studies.^{14,16} In our study, 2 patients developed swelling and pain which persisted for 3 weeks. These patients required extensive rehabilitation. None of our patients had any neurological injury.

CONCLUSION

Percutaneous release using this push-pull technique is a simple and a safe method for trigger thumb. Localization of A1 pulley using anatomical landmarks during percutaneous release can prevent neurological injury to thumb. The complications like scar tenderness, digital nerve injury and bow stringing of flexor tendons which was found in open technique was not observed in this percutaneous push pull technique.

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