Ann Med Res 2020;27(9):2665-8

Annals of Medical Research

DOI: 10.5455/annalsmedres.2020.05.468

Original Article

Complications after the percutaneous release of trigger thumb in adults

Okan Aslanturk[1], Ozgur Yilmaz[2], Bunyamin Ari[3], Ali Canbay[4], Huseyin Kavak[5]

[1]Department of Orthopedics and Traumatology, Malatya Education and Research Hospital, Malatya, Turkey
[2]Clinic of Orthopedics and Traumatology, Elazig Fethi Sekin City Hospital, Elazig, Turkey
[3]Department of Orthopedics and Traumatology, Ankara Yeni Mahalle Education and Research Hospital, Ankara, Turkey
[4]Clinic of Orthopedics and Traumatology, Kahramanmaras Elbistan State Hospital, Kahramanmaras,Turkey
[5]Clinic of Orthopedics and Traumatology, Istanbul Ulus Liv Hospital, Istanbul, Turkey

Abstract

Aim: Trigger finger is a common orthopedic problem causing pain and could restrsict daily activities. Surgical intervention can be done via open or percutaneously. There is not much data about minor complications in literature. In this study, we reported our results and complications of percutaneous release (PR) of trigger thumb.

Material and Methods: Retrospective data of patients treated for trigger thumb with PR between September 2017 and January 2019 were reviewed. Age, gender, affected side, preoperative Quinnell grade of triggering; previous history of steroid injection and history of medical diseases (e.g. diabetes mellitus, rheumatoid arthritis) were recorded.

Results: Thirty thumb of 28 patients who met the inclusion criteria treated with PR for trigger thumb included in the study. Mean age of patients was 53.7 ±9.95 months (range 36-73). Twenty (71%) of patients were female, 8 (29%) were male. Right hand was dominant side in all patients. Right thumb was affected in 18 (64%) patients, left thumb in 8 (29%) and 2 (7%) were bilateral. Due to Quinnell grading system 9 (32%) patients were grade 2 and 19 (68%) were grade 3. Twenty (71%) of patients had previous history of steroid injection. There were 5 complications in our patients. One recurrence of triggering and 4 ecchymosis and edema have been reported.

Conclusion: Percutaneous release of trigger thumb is safe and reliable technique with low complication rate. To prevent complication surgeon should be careful during the procedure and should well inform patient what to do after procedure.

Keywords: Hand surgery; percutaneous release; trigger thumb

INTRODUCTION

Trigger finger is mostly caused by mismatch of size between flexor tendon and the first annular (A1) pulley (1). Symptoms of trigger finger are varied from painless clicks with finger movement to locked finger due to secondary contracture (2).

Treatment options for trigger finger are bracing, corticosteroid injection and A1 pulley release via open surgery or percutaneously. The corticosteroid injection around flexor tendon sheet is recommended as first line treatment (2). Major disadvantage of corticosteroid injection is 20% recurrence rate (3). Slow recovery, scarring and infection risk are disadvantages of open A1 pulley release (4). Risk of digital nerve injury and incomplete release are the drawbacks of percutaneous release (5).

Digital nerve damage is one of the biggest concerns about percutaneous trigger thumb release because of the radial digital nerve crosses from ulnar side to radial side close to A1 pulley (Figure 1) (6). In this study, we aimed to report complications of percutaneous release (PR) of trigger thumb.

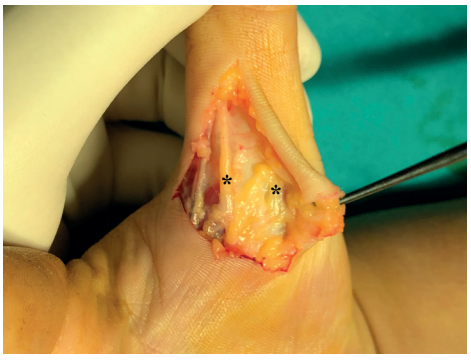

Figure 1. Digital nerves of thumb. * shows the digital nerves. The photo from archive of authors that from a surgery required nerve exposure during surgery, not from an trigger thumb surgery

Received: 11.05.2020 **Accepted:** 24.08.2020 **Available online:** 21.10.2020
Corresponding Author: Okan Aslanturk, Department of Orthopedics and Traumatology, Malatya Education and Research Hospital, Malatya, Turkey **E-mail:** okaslanturk@hotmail.com

MATERIAL and METHODS

Retrospective data of patients treated for trigger thumb with PR between September 2017 and January 2019 were reviewed. Inclusion criteria were patients treated with PR, older than 18 years old, without recurrence of triggering after surgical release and at least 6 months follow-up.

Age, gender, affected side, preoperative Quinnell grade (7) (Table 1) of triggering, previous history of steroid injection and history of medical diseases (e.g. diabetes mellitus, rheumatoid arthritis) were recorded.

All patients were informed about the procedure and informed consent form was obtained from all patients for inclusion in the study. All procedures in the study were in accordance with ethical standards of the Helsinki Declaration.

Table 1. Quinnell classification

Grade	Clinical Findings
0	No triggering, but mild crepitus
I	No triggering, but uneven movement of finger
II	Actively correctable triggering
III	Passively correctable triggering
IV	The finger is locked

Surgical Procedure

All procedures were performed by same surgeon under local anesthesia in outpatient clinic. Povidone-iodine is used to antisepsis of skin. One or 2 cc of lidocaine %1 was administered with 26 G needle subcutaneously over A1 pulley of thumb. Then, a 18 G needle inserted perpendicularly in the point midline of thumb intersected with flexor crest of thumb (Figure 2).

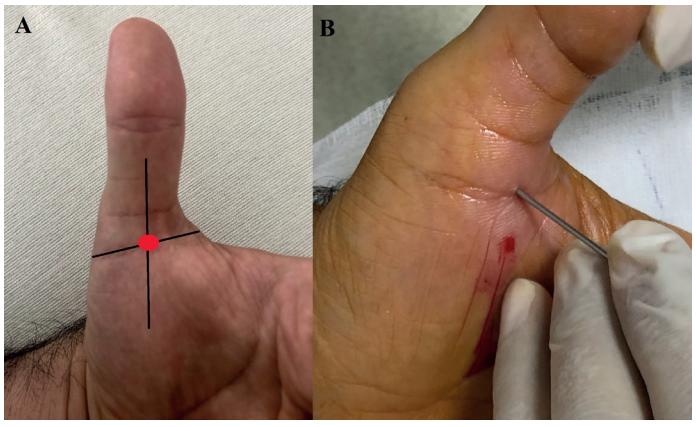

Figure 2. A. Safe point for insertion of needle is the crossing point of the line bisecting thumb perpendicularly and the line parallel to flexor crest of thumb B. Insertion of needle

After insertion of the needle, the patient asked to flex the thumb to ensure about needle is not in the flexor tendon. If the needle moves during the finger motion, it is drawn back. When being sure about needle is not moving with thumb motion, the needle is moved distally and proximally in a line to release A1 pulley. A typical grating feeling can be felt when cutting the fibers of A1 pulley. Loss of grating sensation and no more triggering during the thumb motion were considered as complete release.

After procedure, a compressive bandage was applied. Could therapy with ice pack over the bandage for the operation day was recommended. NSAIDs were prescribed for pain. The patients were encouraged to thumb motion without any restriction.

Statistical analysis

IBM SPSS version 21.0 (SPSS Inc., Chicago, IL, USA) were used to analyze data (mean, standard deviation).

RESULTS

Thirty thumbs of 28 patients who met the inclusion criteria treated with PR for trigger thumb included in the study. Mean age of patients was 53.7 ±9.95 months (range 36-73). Twenty (71%) of patients were female, 8 (29%) were male. Right hand was dominant side in all patients. Right thumb was affected in 18 (64%) patients, left thumb in 8 (29%) and 2 (7%) were bilateral. Due to Quinnell grading system 9 (32%) patients were grade 2 and 19 (68%) were grade 3 (Table 2). There was no grade 4 patient in our series. Two patients had diabetes mellitus. All patients reported pain in interphalangeal joint of thumb concomitant with triggering. Twenty (71%) of patients had previous history of steroid injection. Patients without steroid injection history have been offered for an infection but they did not accept. Mean follow-up time was 14.7 ± 6.4 months (range, 6-24).

Table 2. Clinical data of patients

Gender	**n**
Male	19
Female	9
Affected side	
Right	18
Left	8
Bilateral	2
Quinnell classification	
Grade 0	0
Grade I	0
Grade II	9
Grade III	19
Grade IV	0
Previous steroid injection	
Yes	20
No	8
Complications	
Nerve injury	0
Tendon rupture	0
Recurrence	1
Edema and Ecchymosis	4

There were 5 (17%) complications in our patients. One was recurrence of triggering after 2 weeks of initial procedure. The patient underwent open release. During the open release, there was superficial laceration on flexor tendon. Other 4 (14%) patients had reported minor complications (ecchymosis and edema). All of 4 patients reported early removal of bandage and not applied cold therapy. The patients with ecchymosis and edema were treated with topical NSAID and could therapy. All of 5 patients with complications had no complaints on final follow-up. There was no other major complication (nerve injury, tendon rupture or persistent pain) in any patient until final follow-up.

DISCUSSION

Trigger finger is a common orthopedic problem causing pain and sometimes limiting daily activities. Surgical release of A1 pulley is reliable and universally accepted technique when conservative treatment failed to resolve symptoms. Percutaneous release reported with excellent and comparable results with open release. But there is not much data about minor complications after PR. We found 14% minor complication in our series.

Cebesoy et al. reported complete release in 21 of 25 (84%) patients treated with PR and concurrent steroid infection (1). All the 4 patients underwent open release and they stated that there was no inflammation and edema in their series regardless of type of treatment. In current study, there were one incomplete release, 4 edema and ecchymosis. Success rate was 96.6% (29 of 30 finger) and complication rate was 17.2% in our series. We did not administer concurrent steroid in our series. Liu et al. reported no benefit of additional steroid injection concurrent with PR (8). Jegal et al. reported less pain with steroid injection 3 weeks after PR but they reported less pain 3 months after PR in patients without steroid injection (9).

The main concern with PR is digital nerve injury especially for thumb (10). But many studies in literature have shown that no digital nerve injury after PR (1,8,10-12). Another concern about PR is flexor tendon injury (10). Especially in cadaveric studies flexor tendon injuries have been reported (13,14). Properties of cadaveric tissue is different from living tissues. Also, during the PR, movement of thumb or finger and grating sensation can be used to not to harm flexor tendon. Minimal longitudinal laceration of flexor tendon did not affect function of tendon and not require tendon repair (1,10). In our series, one patient required open relapse due to recurrence of triggering and we observed minimal laceration of flexor tendon which did not affect function of tendon. There was no digital nerve injury in our series.

PR can be performed with different instruments. In literature, 14 to 21 G needles, surgical blades, angiocath needles or special designed knife have been used for PR (15). In our series, we used 18 G needle. We believe using a needle is easier to control movements and using blades requires much bigger skin perforation than a needle.

In literature, there are studies comparing PR and open release (5,15-17). All these studies have reported similar results in terms of failure and complications rates. PR also can have advantage of surgical time and expense (18). Additionally, PR also can be performed in outpatient's clinic conditions. Scar complications, infection and recurrence reported after open release in a large patient series (19). We could not compare our results with open technique due to lack of a control group.

Weiss and Richter reported swelling after PR in some of the patients, but they did not report any number or percentage (11). Dierks et al. reported inflammation in only one patient in treated with PR using surgical blade (15). Werthel et al. reported swelling only 1 of 171 patients treated with PR using no:11 surgical blade. In our series we had 14% minor complication rate which is higher than currently reported rates in literature. We think that was associated with early removal of bandage and not using cold therapy adequately.

Retrospective design, small sample size and lack of a control group, lack of pain, clinical or functional outcome measure are limitations of our study.

CONCLUSION

PR of trigger thumb is safe and reliable technique with low major complication rate. However minor complications still may be seen and could cause pain especially in early post-operative period. To prevent minor complications, patients should be informed very well about cold therapy and bandage usage in early period.

Competing interests: The authors declare that they have no competing interest.

Financial Disclosure: There are no financial supports.

Ethical approval: Inonu University Ethics Committee 2020/968.

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