Efficacy of Percutenous Trigger Finger Release

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ABSTRACT

Objective: To determine the efficacy of trigger finger release with the percutaneous technique.
Study Design: Cross-sectional study.
Place and Duration of Study: Department of Orthopedic Surgery, Jinnah Post Graduate Medical Center, Karachi Pakistan, from Mar 2017 to Mar 2018.
Methodology: One hundred and three patients were selected through the outpatient department after they meet the inclusion criteria with one or more trigger fingers in whom percutaneous release was indicated. Patients with previously open release, carpel tunnel syndrome, osteoarthritis of the hand and Dupuytren's contracture were excluded.
Results: The mean age of patients was 34.79 ± 14.08 years with a range of 17-62 years. More patients were male (56.3%), and females were 43.7% with a male to female ratio of 1.27:1. Accordingly, 95 (92.2%) out of 103 had complete relief of symptoms and the procedure was thus efficacious in these patients. Among the remaining 7.8% of patients in whom it was not efficacious, about 2.2% had partial relief while 5.6% had either no benefit or worsening of symptoms as assessed on the 8th week post-operatively. Age was a significant effect modifier (p<0.05).
Conclusion: Overall, the percutaneous technique of trigger finger release is an effective method of treatment.

Keywords: Efficacy, Percutaneous release, Stenosing tenovaginitis, Trigger finger.

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INTRODUCTION

Stenosing tenovaginitis (Trigger Finger) is a condition caused by nodule or thickening of flexor tendon, which is trapped on the proximal edge of the first annular pulley (A1) when the finger is actively flexed.[1] Incidence of trigger finger is 2.2% in adults and 10% in diabetics.[2] The mis-match is due to the formation of a nodule in the flexor digitorum superficialis tendon, in the region of the metacarpal head. Rarely a nodule form in flexor digitorum profundus tendon.[3] Commonly it is idiopathic. Stenosing tenosynovitis is more common in women than men with the peak incidence in the fifth to sixth decades of life.[4] The dominant hand is more affected; the most common is the thumb followed by the ring, long, small, and index fingers.[5] Clinically palpable popping, clicking or snapping sensation over the A1 pulley, locking inflexion (in later stages, passive manipulation is needed to extend the digit), stiffness of the digit, tenderness over the A1 pulley, flexion deformity or joint contracture in late presentations, especially the PIP joint.[5]

Green classified triggers finger-according to the severity of symptoms. It has 4 grades. In Grade-I, there is only pain and tenderness at the A1 pulley. In Grade-II there is a catching of digits. In Grade-III, there is the locking of digits, which is passively correctable. In Grade-IV, fixed locked digits are present.[6,7] The goal of treatment for trigger digits is to eliminate the locking and allow full movement of the finger or thumb without discomfort. Trigger finger treated with steroid injection and splint, open and percutaneous release.[8] Even though the open release is a simple procedure, follow up series has documented poor results secondary to complications including complex regional pain syndrome, infection, stiffness, nerve injury and dissatisfaction rates as high as 17-26%.[2,9] The percutaneous approach has been reported as a safe, effective procedure with clinical efficacy of 92.8%.[4] It is a quick procedure with significant good results in short term post-operative rehabilitation.[10] No major complication has been reported after percutaneous release.

Despite safety and efficacy, the procedure is very scantly chosen by the orthopaedic surgeons in Pakistan due to the non-availability of evidence-based data in the local population. Putting abreast of the dire need for research on the issue the current study was planned and conducted to determine the efficacy of percutaneous trigger finger release in patients visiting a tertiary care centre in Karachi.

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METHODOLOGY

This cross-sectional study was conducted at the Department of Orthopedic Surgery, Jinnah Post-graduate Medical Centre, Karachi Pakistan, from March 2017 to March 2018. The sample consisted of 103 patients, who were selected through the outpatient department

Inclusion Criteria: Patients of age group more than 16 years and less than 70 years, with Grade III & IV trigger finger, after the failure of conservative treatment were included in the study.

Exclusion Criteria: Patients with previously open release, carpel tunnel syndrome, osteoarthritis of the hand and Dupuytren's contracture were excluded.

All the data was collected and recorded in proforma. Informed consent was taken. The percutaneous release is a blind procedure in which, under local anaesthesia and tourniquet control, first the nodular thickening was palpated over the metacarpal head and then released through an 18G needle or 45 degrees full handle knife inserted close to condition.[11] The procedure was done by a consultant with at least 2 years of experience. OPD follow up was carried out on the 2nd, 4th and 8th week for assessment of symptoms. The outcome was assessed in the 8th week according to Quinnell's criteria,[12] where pain, activity level and patient satisfaction were assessed. The outcome was noted as complete when the patient had no pain, was satisfied and returned to work which is rated as excellent, Partial when the patient had pain only with heavy use but return to work and satisfied rated as good, or no relief where the pain is unchanged and the patient is dissatisfied rated as poor according to Quinnell's criteria. Complete relief was taken as efficacy positive.

Statistical Program for Social Sciences (SPSS) version 23 was used to analyze the data. Age was presented by mean and standard deviation values. Gender, grade (severity) & efficacy was presented by frequency and percentage. Effect modifiers would be controlled by stratification of age, diabetes mellitus, grade and gender and Fisher exact test were applied to see the effect of these on outcome variables and $p \leq 0.05$ was taken as significant.

RESULTS

The mean age of patients was 34.79 ± 14.08 years with a range of 17-62 years. Out of 103 patients, fifty patients were in the age group of 21-40 years (47.6%). About 58 patients were male (56.3%) and 45 were females (43.7%) with a male to female ratio of 1.27:1. When evaluated for co-morbidity and the presence of diabetes mellitus; (if present then controlled or uncontrolled), it was found that 49 patients were not having diabetes mellitus (47.6%). Among other 54 patients who had diabetes (52.4%); the disease was well controlled in 23.3% and uncontrolled in 25.2% (Table-I).

Table-I: Characteristics of patients who were treated for percutaneous trigger finger release.

Variables	n (%)
Age (years)	
< 20	17(16.5)
21-40 years	50(48.5)
41-60	27(26.2)
≥ 61 years	9(8.8)
Mean±SD	34.91 ± 14.01
Gender	
Male	58(56.3)
Female	45(43.7)
Diabetes	
Yes	54(52.4)
No	49(47.6)

Out of 103, 59 patients (57.3%) complained of involvement of one finger, while 44 patients (42.7%) had two fingers affected by triggering. Further, according to Green's classification, about 21 patients in the current study presented with a Grade-I of triggering, 9 with Grade-II, almost 39 with Grade-III while the remaining 34 were having a Grade-IV triggering of the finger (Figure-1).

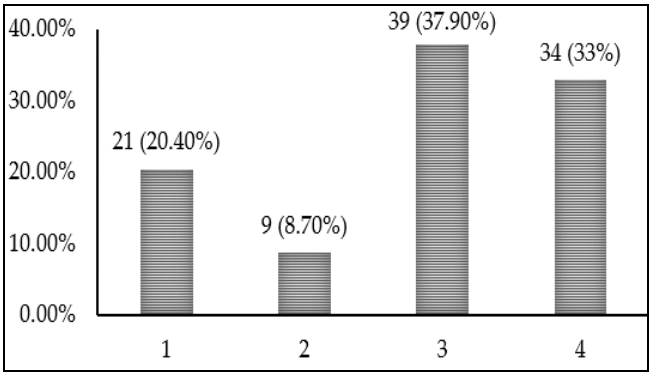

Figure-1: Grade of trigger finger at time of presentation.

All the patients had taken on or other treatment. Accordingly, 30% took analgesics only, 34% steroids, 9% used physiotherapy techniques while 30% were patients who had used all these treatment options but failed to relieve symptoms. The primary outcome of the current study was the efficacy of the percutaneous release of the trigger finger. Accordingly, 95 patients

(89%) had complete relief of symptoms and the procedure was thus efficacious in these patients (Figure-2). Among the remaining 11 patients (7.8%) in whom it was not efficacious; about 2.2% had partial relief while 5.6% had either no benefit or worsening of symptoms as assessed on the 8th week post-operatively.

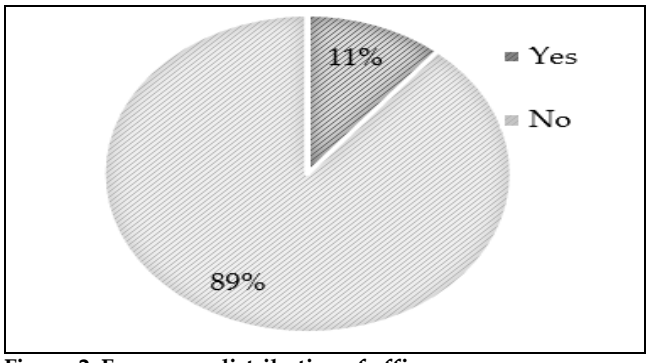

Figure-2: Frequency distribution of efficacy.

The age of patients has not affected the efficacy of the percutaneous release of the trigger finger (*p*-value =0.063). Efficacy was highest among patients of age 21-40 years. It gradually decreased with increasing age such that it was lowest among patients of age 61 years and above. Accordingly, it was seen that gender was not an effect modifier as the percutaneous release of the trigger finger (*p*-value=0.727). When the grading of the trigger finger was evaluated it was noted that it had a non-significant effect on the efficacy of percutaneous release of the trigger finger (*p*-value=0.273). Further, it was noted that the presence of diabe-tes mellitus and its control was not a strong effect modifier. In the 48 patients who did not have the disease, the efficacy of percutaneous release of the trigger finger was maximum that 90.5%. Among diabetics, for those who had controlled disease, the efficacy was more (100%) than those who had the uncontrolled disease (88.4%) (*p*-value=0.336) (Table-II).

DISCUSSION

There is increased attention gained by the percutaneous release of trigger digits within a very short time as many cadaveric followed by real-time research studies have found the minimally invasive technique very effective and safe than the usual technique of open surgical release which is very painful and has many rehabilitation issues. The current study has found promising results of effectiveness in the percutaneous release of trigger digits in local patients. The results are in matching with those found in studies from other countries.

A study conducted at Dicle University on 48 triggers fingers of 48 patients (36 females and 12 males) aged between 42-68 years (mean age, 52 years) had complete resolution of pain and locking compared to only one of the fingers that had open surgery which had a successful release of the pulley. Only 2 patients had minor abrasions, without any tendon injury.[13] A comparative study of percutaneous trigger fingers with and without steroid use conducted on 432 digits had 97.5% of the patients in the steroid group and 99.1% of those in the non-steroid group were pain-free and reached a full ROM without complications (*p*= 0.192). Complication rate was 0.5% in the steroid group and 0% in the non-steroid group (*p*=0.228).[14]

Table-II: Efficacy with respect to age groups, gender, grade of trigger finger and diabetes mellitus.

Variables	Efficacy		Total	*p*-value
	Yes n (%)	No n (%)		
Age Groups				
≤ 20 years	16 (94.1)	1 (5.9)	17	
21-40 years	47 (94)	3 (6)	50	
41-60 years	26 (96.3)	1 (3.7)	27	0.063
>60 years	6 (66.7)	3 (33.3)	9	
Gender				
Male	54 (93.1)	4 (6.9)	58	0.727
Female	41 (91.1)	4 (8.9)	45	
Grade				
1	18 (85.7)	3 (14.3)	21	0.273
2	8 (88.9)	1 (11.1)	9	
3	38 (97.4)	1 (2.6)	39	
4	31 (91.1)	3 (8.9)	34	
Diabetes Mellitus				
Controlled	24(100)	-	24	0.336
Uncontrolled	23(88.5)	3(11.5)	26	
No	48(90.6)	5(9.4)	53	

The study was conducted in Taiwan where 198 patients with trigger fingers were treated with either open (n=72) or percutaneous (n=126) release of the A1 pulley. Short-term satisfaction of patients in the percutaneous group was significantly better, whereas the long term satisfaction rates were better in the open release.[15]

Uni-lateral trigger fingers of 46 patients treated with percutaneous release in New Delhi, showed excellent results in 82.6% (38/46) patients, good in 13.0% (6/46) patients and poor results encountered in 4.3% (2/46) patients. 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%.[16] Percuta-

neous release of trigger fingers and thumb is an effective and safe method of treatment.[17]

The study was conducted in Thailand, where the percutaneous release of the A1 pulley was done by using a Kirschner wire 2.5mm complete release was obtained in 78% of cadaveric fingers.[18] The study conducted by Hossein Saremi, *et al*, showed 52 out of 52 fingers (100%) complete relief of symptoms like pain, locking, and catching with no recurrence in 03 months follow up.[19] Prospective study on 61 trigger fingers treated under ultrasound guidance showed completely resolved in 96.7% of patients.[20] Marij *et al*, showed complete release of the A1 pulley with 19 gauge needle in 60 of the 70 digits (85.7%).[21] A recent study conducted by Quershi *et al*, included patients with trigger fingers or thumbs who were percutaneously released under local anaesthesia, postoperatively excellent results were achieved in 90.9% (20/22) patients and good in 9% (2/22) patients at six months follow up. There were only 3 (9.3%) failed releases requiring conversion to open release. There was no recurrence of trigger finger and no digital nerve nor tendon injuries were reported.[22] Weiss *et al*, in their study evaluated 537 successful releases (90.1%). Of the 59 failures, 17 underwent another percutaneous procedure (15 successful) and 40 underwent open surgical release (100% successful); 2 patients requested no further treatment. There were no significant differences in digit success rates and no complications reported.[23]

CONCLUSION

The current study concluded that percutaneous release of the trigger finger is safe, less painful with good efficacy therefore can be performed as the first option. Rehabilitation will add relief to symptoms.

Conflict of Interest: None.

Author's Contribution

MQA: Conception, design, SAS: Drafting, collection and assembling of data, BS: Analysis, interpretation of data, MA: Critical review of article, ARJ: Final approval of article.

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