

Original Research Article

Results of percutaneous release of stenosing tenosynovitis (trigger finger) using hypodermic needle

Shiv Kumar¹, Khalid Muzzafar^{1*}, Irfan Tasaduq², Arpan Bijyal¹

¹Department of Orthopaedics, GMC AH, Doda, Jammu and Kashmir, India

²GMC AH, Doda, Jammu and Kashmir, India

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***Correspondence:**

Dr. Khalid Muzzafar,

E-mail: khalidmuzzafar@gmail.com

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ABSTRACT

Background: Stenosing tenosynovitis or trigger finger is a common condition affecting finger function, which can lead to disability in hand function. Treatment in form of conservative can be helpful in early stages, however later stages and chronic triggering needs release of A1 pulley either by open or percutaneous methods. The aim of this study was to find the results of percutaneous release of trigger finger with 18 gauge needle.

Methods: 43 digits in 36 patients were enrolled for this prospective study in a district level hospital over a 2 year period. Release was done under local anaesthesia using 18 gauge needle percutaneously. Follow up was done upto 6 months. Final scoring was done at 6 months using Quinell's criteria.

Results: We had 81.39% (35 out of 43) excellent to good results. 19.61% (8) needed open release. We had no neurovascular injury or infection in our series.

Conclusions: Percutaneous release by 18 gauge needle is safe and effective treatment for trigger finger without much complication.

Keywords: Stenosing tenosynovitis, Trigger finger, Percutaneous release

INTRODUCTION

Stenosing tenosynovitis commonly called as trigger finger first described by Notta in 1850 is defined as symptomatic locking of flexion and extension of any digit.¹ It is a very common condition affecting hands particularly in elderly females. This usually is caused by thickening of A1 pulley by its hypertrophy which causes entrapment of tendon and results in triggering.² It cause pain, discomfort and interferes with normal finger function initially and if left untreated may progress to contracture of proximal interphalangeal joint of the finger involved and lead to disability in hand function.³

Though Trigger finger has been associated with Rheumatoid arthritis, hypothyroidism, diabetes mellitus,

mucopolysaccharoidosis, most cases however are idiopathic.⁴

Treatment usually depends on severity of symptoms ranging from conservative in form of splintage, NSAID's oral or local steroids in less severe cases to surgical release of A1 pulley in severe, chronic and cases where conservative fails. The release of A1 pulley can be done percutaneously (by a tenotome or hypodermic needle) or by open method.^{5,6} Complications like bowstringing of tendons, infection, digital nerve injury can occasionally occur.

Lorthioir in 1958 was first to describe percutaneous release using a tenotome.⁷ Eastwood in 1992 used needle first time for the percutaneous release.⁸ Many authors

cautioned about the proximity of neurovascular structures to A1 pulley, however studies by Patel, Gilbert, Ragoowansi showed that percutaneous release is safe.⁹⁻¹¹

The aim of this study is to evaluate results of percutaneous release of trigger finger using 18 gauge hypodermic needle.

METHODS

Study design

This prospective study was conducted on patients visiting for Trigger finger at District Hospital Doda from January 2017 to December 2018. Ethical clearance was approved from the institutional ethics committee according to ICMR guidelines. All cases were done by single senior consultant of the department. A conservative trial of 4 weeks in form of night splintage and NSAIDs was given to all patients. Patients who did not respond to conservative were included in the study. Patients who had previously be operated and had recurrence of symptoms were excluded from the study. Routine laboratory investigations of bleeding time, clotting time, random blood sugar and viral markers for retrovirus, hepatitis B and C were done.

Surgical technique

The procedure was performed under 3-5 ml of 2% xylocaine infiltrated into skin between distal palmar crease and proximal digital crease after preparing and draping. A1 pulley was located by palpation and point of triggering identified and marked. The finger was

hyperextended at metacarpophalangeal joint. Hyperextension results in putting flexor tendon sheath directly beneath the skin and pushing neurovascular bundle away.¹³ 18 gauge is inserted into the flexor sheath at the marked point, the needle is moved up and down in such a way that bevelled edge of the needle cuts the A1 pulley until grating feeling is not felt any more. At this point patient was asked to flex and extend the digit in order to access the release. A small dressing was used for 24 hours and activities were allowed soon after the procedure.

Follow up was done till 6 months. Quinell's criteria were used for final grading done at final follow up at 6 months.¹¹

RESULTS

A total of 36 patients with 43 digits were included in the study. There were 9 males (25%) and 27(75%) females. The distribution of involvement of digits was thumb 12 (27.9%), index finger 2 (4.65%), middle finger 8 (18.60%), ring finger 21 (48.83%). Our series didn't have any little finger involvement.

Triggering was idiopathic in 26 patients (60.46%), 3 patients (6.97%) were diabetic, 6 (13.95%) had rheumatoid arthritis while one (2.32%) had history of Dequverians tenosynovitis. The average age of patients was 52.4yrs (31 to 72 years). Grading of severity was done as per Ha KI, Park MJ as shown in Table 1.¹² We had 2 patients (4.65%) with grade I severity, 27 (62.79%) with grade II, 11 (25.58) with grade III and 3 patients (6.97%) with grade IV severity.

Table 1: Stage wise distribution of involvement of digits.

Grade	Symptoms	Involvement of digits					Total (%)
		Thumb	Index	Middle	Ring	Little	
I	No triggering, but uneven finger movement	1	-	1	-	-	2 (4.65)
II	Actively correctable triggering	7	2	5	13	-	27 (62.79)
III	Triggering usually correctable by the other hand	3	-	2	6	-	11 (25.58)
IV	Locked digit	1	-	-	2	-	3 (6.97)
Total (%)		12 (27.90)	2 (4.65)	8 (18.60)	21 (48.83)	Nil	43

Table 2: Final result of percutaneous release of trigger finger digit wise based on Quinell's criteria.

Digit	Number involved	Result		
		Excellent	Good	Poor
Thumb	12	3	7	2
Index	2	-	2	-
Middle	8	2	5	1
Ring	21	5	11	5
Total (%)		10 (23.25)	25 (58.13)	8 (18.60)

Out of 43 digits in 36 patients, 40 (93.02%) digits could be released by percutaneous needling. 3 (6.97%) digits which couldn't be released underwent open release in the same sitting. We had 10 (23.25%) excellent, 25 (58.13%) good and 8 (18.60%) poor results (Table 2). Out of 8 poor, 3 (6.97%) were those who couldn't be released, and 5 (11.62%) had occasional locking on subsequent follow up. All of them underwent open release later, with complete resolution of symptoms thereafter. One of our patients developed a haematoma at needling site post procedure, which resolved with icing and NSAID's in 5 days. We didn't encounter any wound infection, bowstringing or neurovascular injury.

DISCUSSION

Stenosing tenosynovitis or trigger finger is a very common condition presenting in Orthopaedic out patient department. If not managed properly, it causes discomfort and disability in hand function.

There are many acceptable methods of treating trigger finger from conservative in form of NSAID's, oral steroids to local steroid injections. Operative management in form of percutaneous or open release of A1 pulley is needed in some.

Conservative modalities have been successful in 57% to 97% of cases.^{13,14} Local steroid injection appears to be more helpful in early stages.¹⁵ Rhoades et al had only 45% success rate with conservative when symptoms had been present for more than 6 months.¹⁶ Failure of conservative methods prompted for need of surgical release of A1 pulley.

Pope et al had excellent results after open release showing upto 100% satisfactory release in some studies¹⁷. However, scar tenderness, infection, bowstringing, and time of returning to normal activity remained some major concerns in open release occurring in upto 28% in some series.^{18,19}

Lorthior in 1958 did first percutaneous release using a fine tenotome. His series had good results in all the 52 patients.⁷ Ha et al reported 92% satisfactory results using special blade with a hook.¹² Jongjirasiri used 15° full handle knife with success in 314 out of 334 digits.²⁰

Percutaneous release using a needle was described first by Eastwood in 1992.⁸ He had success rate of 94%. A major concern in percutaneous release was close proximity of digital nerves to A1 pulley.^{17,21} Hyperextending the digit and using a midline point for release helps avoid injuring digital nerve.²²

None of our patients in present series had digital nerve injury. We had successful percutaneous release in 35 digits out of 43. 3 digits couldn't be released and on table it was decided to do an open release. 5 patients developed uneven finger flexion and extension in follow up, for

them open release was done at a later stage, intra operative it was found that a small band had been left unreleased.

Ranjeet et al in their study concluded that both subjective and objective criteria in comparing percutaneous release and open release for trigger finger indicate no statistically significant difference, however the postoperative pain, recovery to work and mean time to hand function was better in the percutaneous group.²³

CONCLUSION

Percutaneous release of A1 pulley in trigger finger by 18 gauge needle is safe and effective procedure, with minimum complications and early return to activity.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

- Makkouk AH, Oetgen ME, Swigart CR, Dodds SD. Trigger finger: etiology, evaluation, and treatment. *Curr Rev Musculoskelet Med.* 2008;1:92-6.
- Sampson SP, Badalamente MA, Hurst LC, Seidman J. Pathobiology of the Human A1 pulley in trigger finger. *J Hand Surg.* 1991;16A:714-21.
- Kolind-Sorensen V. Treatment of trigger fingers. *Acta Orthop Scandinav.* 1970;41:428-32.
- Rhoades CE, Gelberman MD, Manjarris JF. Stenosing tenosynovitis of the fingers and thumb. *Clin Orthop.* 1984;190:236-8.
- Murphy D, Failla JM, Koniuch MP. Steroid versus placebo injection for trigger finger. *J Hand Surg.* 1995;20A:628-631.
- Blumberg N, Arbel R, Dekel S. Percutaneous release of trigger digits. *J Hand Surg.* 2001;26(3):256-7.
- Lorthior J. Surgical treatment of trigger-finger by a subcutaneous method. *J Bone Joint Surg.* 1958;40:793-5.
- Eastwood DM, Gupta KJ, Johnson DP. Percutaneous release of trigger finger: an office procedure. *J Hand Surg.* 1992;17:114-7.
- Patel MR, Moradia VJ. Percutaneous release of trigger digit with and without cortisone injection. *J Hand Surg.* 1997;22:150-5.
- Gilberts ECAM, Beekman WH, Stevens HJPD, Wereldsma JCJ. Prospective randomized trial of open versus percutaneous surgery for trigger digits. *J Hand Surg.* 2001;26:497-500.
- Ragoowansi R, Acornley A, Khoo CT. Percutaneous trigger finger release: the 'lift-cut' technique. *Br J Plastic Surg.* 2005;58:817-21.
- Ha KI, Park MJ, Ha CW. Percutaneous release of trigger digits. A technique and results using

- specially designed knife. *J Bone Joint Surg (Br)*. 2001;83:75-7.
13. Cebesoy O, Karakurum G, Kose KC, Baltaci ET, Isik M. Percutaneous release of the trigger thumb: Is it safe, cheap and effective? *Int Orthop (SICOT)*. 2007;31:245-9.
 14. Patel MR, Bassini L. Trigger Pngers and thumb: When to splint, inject, or operate. *J Hand Surg*. 1992;17(1):110-3.
 15. Turowski GA, Zdankiewicz PD, Thomson JG. The results of surgical treatment of trigger Pnger. *J Hand Surg*. 1997;22:145-9.
 16. Rhoades CE, Gelberman MD, Manjarris JF. Stenosing tenosynovitis of the Pngers and thumb. *Clin Orthop*. 1984;190:236-8.
 17. Pope DF, Wolfe SW. Safety and effPcacy of percutaneous trigger Pnger release. *J Hand Surg*. 1995;20:280-3.
 18. Turowski GA, Zdankiewicz PD, Thomson JG. The results of surgical treatment of trigger Pnger. *J Hand Surg*. 1997;22:145-9.
 19. Vaes F, Smet LD, Ransbeeck HV, Fabry G. Surgical treatment of trigger Pngers. *Acta Orthopaedica Belgica*. 1998;64(4):363-5.
 20. Jongjirasiri Y. The results of percutaneous release of trigger digits by using handle knife 15°: An anatomical hand surface landmark and clinical study. *J Med Assoc Thai*. 2007;90(7):1348-5.
 21. Bain GI, Turnbull J, Charles MN, Roth JH, Richards RS. Percutaneous A1 pulley release: A cadaveric study. *J Hand Surg*. 1995;20:781-4.
 22. Maneerit J, Sriworakun C, Budhrajana N, Nagavajara P. Trigger thumb: results of prospective randomised study of percutaneous release with steroid injection versus steroid injection alone. *J Hand Surg*. 2003;28(6):586-9.
 23. Ranjeet N, Sapkota K, Thapa P, Onta PR, Wahegoankar K, Thapa UJ, et al. Trigger Finger: a prospective randomised control trial comparing percutaneous release versus open release. *J Clin Diag Res*. 2018;12(7):5-8.

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