

Outcomes of Trigger Finger After Surgical Release of A1 Pulley: A Prospective Study of 36 Patients

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Abstract

Background: Trigger finger (stenosing tenosynovitis) is a common condition characterized by painful locking or snapping of the affected digit due to thickening of the A1 pulley and flexor tendon inflammation. Surgical release of the A1 pulley is considered the gold standard for cases refractory to conservative management. This study evaluates clinical outcomes following open surgical release of the A1 pulley in 36 patients. **Material and Methods:** A prospective observational study was conducted on 36 patients diagnosed with trigger finger and treated with open A1 pulley release between January 2023 and December 2025 at Government Medical College Rajouri. Patients were evaluated using Quinnell grading, Visual Analogue Scale (VAS) for pain, and range of motion (ROM) preoperatively and during follow-up at 2 weeks, 6 weeks, and 3 months postoperatively. **Results:** The mean age was 47.8 ± 10.4 years, with female predominance (61%). The thumb was the most commonly involved digit (44%), followed by the ring finger (28%). Complete resolution of triggering was achieved in 94.4% of patients. Mean VAS score improved significantly from 6.8 ± 1.1 preoperatively to 0.9 ± 0.6 at 3 months ($p < 0.001$). Minor complications were observed in 2 patients (5.5%), including superficial wound infection and transient stiffness. No recurrence was observed during follow-up. **Conclusion:** Open surgical release of the A1 pulley is a safe, effective, and definitive treatment for trigger finger, demonstrating high success rates and minimal complications in the present study.

Keywords: Trigger finger, Stenosing tenosynovitis, A1 pulley release, Hand surgery, Surgical outcomes.

Received: 19 January 2026

Revised: 16 February 2026

Accepted: 25 February 2026

Published: 05 March 2026

INTRODUCTION

Trigger finger, also known as stenosing tenosynovitis, is characterized by painful clicking, snapping, or locking during finger movement due to mismatch between the flexor tendon and its sheath at the level of the A1 pulley.^[1-6] The condition commonly affects middle-aged individuals and is more prevalent among women and diabetic patients.^[7-10]

Pathologically, thickening of the A1 pulley and fibrocartilaginous metaplasia result in impaired tendon gliding. Conservative management includes splinting, NSAIDs, and corticosteroid injections.^[11-13] However, surgical release of the A1 pulley remains the definitive treatment in persistent or severe cases.^[14-16]

This study evaluates clinical and functional outcomes following open A1 pulley release in 36 patients treated at a tertiary care institute of North India.

MATERIALS AND METHODS

The present study was a Prospective observational study which was conducted in the Department of Orthopaedics, Government Medical College Rajouri, Jammu & Kashmir, India from January 2023 – December 2025. The study included 36 patients who consented to be study participants. The study was cleared by the institutional review board.

Inclusion Criteria

- Adults aged ≥ 18 years

- Clinically diagnosed trigger finger (Quinnell Grade II–IV)
- Failure of conservative treatment for at least 6 weeks

Exclusion Criteria

- Previous hand surgery
- Rheumatoid arthritis
- Congenital trigger finger
- Active hand infection

Surgical Technique: All procedures were performed under local anesthesia with tourniquet control. A longitudinal incision was made over the A1 pulley. The pulley was identified and completely released while protecting the digital neurovascular bundle. Active intraoperative movement confirmed smooth tendon gliding. Wound closure was performed using interrupted sutures, and a sterile dressing was applied. Early mobilization was encouraged.

Outcome Measures

- Visual Analogue Scale (VAS)
- Range of motion (ROM)

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DOI:
10.21276/amit.2026.v13.i1.400

How to cite this article: Malik I, Lone ZA, Khanday SA. Outcomes of Trigger Finger After Surgical Release of A1 Pulley: A Prospective Study of 36 Patients. Acta Med Int. 2026;13(1):592-594.

- Complications

Statistical Analysis: Data were analyzed using SPSS version 25. Paired t-test was used to compare pre- and

postoperative VAS scores. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1: Demographic variables

Variable	Value
Mean Age	47.8 ± 10.4 years
Female	22 (61%)
Male	14 (39%)
Right Hand	25 (69%)
Left Hand	11 (31%)

Table 2: Digit involved

Digit	Percentage
Thumb	44%
Ring	28%
Middle	17%
Index	8%
Little	3%

Table 3: Complications

Complication	Number	Percentage
Superficial infection	1	2.7%
Transient stiffness	1	2.7%
Recurrence	0	0%

Demographic variables and laterality in patient profile is tabulated in [Table 1]. Thumb was the most commonly involved follow by ring finger [Table 2]. Significant improvement by observed in the study participants. The Mean Pre-operative VAS was 6.8 ± 1.1 and a Mean 3-Month post operative VAS of 0.9 ± 0.6 were documented in the present study ($p < 0.001$). Complete resolution of triggering was seen in 34 patients (94.4%) while as improved range of movement was observed in all cases. No case of recurrence was observed at final follow-up; however, Superficial infection and transient stiffness were observed in one patient each, in the present study [Table 3].

DISCUSSION

Trigger finger is commonly encountered in orthopedic practice. Open A1 pulley release has consistently demonstrated excellent outcomes. Various studies report success rates between 90–98%, which aligns with our findings (94.4%).^[17-19] The female predominance and higher incidence in the thumb observed in our study are consistent with global epidemiological trends. Compared to corticosteroid injections, surgical release offers definitive treatment with minimal recurrence.^[20] Our complication rate (5.5%) was low and comparable with published literature.^[17,18] Limitations of our study include small sample size and short follow-up duration. Larger multicentric studies are recommended.

CONCLUSION

Open surgical release of the A1 pulley provides excellent functional outcomes with minimal complications. Based on

our findings, it should be considered a reliable and definitive treatment modality for trigger finger refractory to conservative management.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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