

Research Articles

Safety and Complications of Open Trigger Finger Release in Patients Over 90 Years Old: A Retrospective Analysis

Roya Khorram, MD¹^a, Muhammad Abdullah, BS², Alexander R. Vaccaro IV, MD¹, Andrew Adeyiga, BS², David Hirsch, MD¹, Pedro Beredjiklian, MD³

¹ Rothman Orthopaedics Florida at AdventHealth, Orlando, FL, USA, ² University of Central Florida, Orlando, FL, USA, ³ Rothman Orthopaedics, Philadelphia, PA, USA

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Background

Although open trigger finger release is widely regarded as a safe and effective procedure, existing literature primarily focuses on younger populations, with limited evidence addressing outcomes in nonagenarian patients. This study aimed to evaluate safety, patient-reported satisfaction, and complication rates following open trigger finger release in patients aged 90 years and older.

Methods

A retrospective cohort study was conducted on 57 patients aged 90 or older who underwent open trigger finger release. Demographic characteristics, comorbidities, surgical details, and postoperative complications were extracted from the chart review. Complications were categorized as major or minor according to predefined criteria.

Results

The mean age at surgery was 92 ± 2 years, with an average duration of symptoms of 5 months (interquartile range, 3-12 months). The median follow-up duration was 2 weeks (interquartile range, 2 –3 weeks). Based on Green's classification, the majority were grade II (58%) or grade IV (25%). No major local complications or return to the operating room occurred. Although 44% of patients received a form of non-local anesthesia, no systemic complications occurred (0%). Minor complications were observed in 3.5% of patients, including wound infection in two cases. Patient satisfaction was high, with 95% reporting satisfaction with surgical outcomes.

Conclusions

Open trigger finger release in nonagenarians demonstrates favorable early postoperative safety. These findings support open trigger finger release in patients aged 90 and older, offering high satisfaction and low risk of major complications. However, the absence of major complications should be interpreted with caution, given the limited sample size and short follow-up duration.

INTRODUCTION

Trigger finger, also known as stenosing flexor tenosynovitis, is a prevalent musculoskeletal condition that affects hand function.¹⁻³ When conservative approaches fail, open surgical release of the A1 pulley is often recommended and

is considered the standard procedure due to its high success rate in alleviating symptoms.^{1,4} This procedure is typically well-tolerated in the general population, with low complication rates, and is associated with a high rate of symptom resolution.^{2,5,6}

^a Corresponding Author:

Roya Khorram, MD
265 East Rollins Street, 11th Floor, Orlando, FL, USA
roya.khorram.md@gmail.com

The effectiveness of open trigger finger release has been well-documented in the general population. Although the procedure is generally regarded as low-risk, complications such as persistent pain, stiffness, wound infections, and even tendon injuries have been reported, with rates varying between 1% and 39%.^{1,2,7-9} The existing body of research predominantly involves younger populations, with minimal focus on nonagenarians, limiting the ability to set realistic expectations for this age group.^{2,10} The aging process introduces additional challenges, including decreased healing capacity and an increased likelihood of comorbidities, which may affect postoperative outcomes and complicate recovery, such as delayed wound healing, limited functional recovery, and increased frailty.^{3,11,12}

With an increasing elderly population and longer life expectancies, the number of elderly patients undergoing elective hand surgeries such as trigger finger release is on the rise. Given the lack of targeted research on the outcomes and complications in patients aged 90 and older, this study aims to evaluate the outcomes and complications of open trigger finger release in nonagenarians. Our null hypothesis was that complication rates would be comparable to those reported in the general population.

METHODS

This retrospective cohort study aimed to assess the safety of trigger finger release procedures in patients aged 90 years and older who underwent surgery between 2014 and 2024.

All surgical procedures were performed by fellowship-trained orthopedic hand surgeons. Patient medical records were reviewed to collect demographic data, comorbidities, and surgical procedure-related information.

Postoperative complications were categorized as local (minor or major) and medical. Minor complications included hematoma, wound dehiscence, or infection. Early swelling, stiffness, and limited range of motion (ROM) were not counted unless requiring intervention. Major complications encompassed persistent or recurrent triggering, complex regional pain syndrome (CRPS), bowstringing of the flexor tendon, deep infection, nerve injury, and the need for reoperation or revision.¹³ Postoperative medical complications included acute kidney injury, myocardial infarction, pneumonia, deep vein thrombosis (DVT), pulmonary embolism (PE), and arrhythmia.

Postoperative complications were also classified using the International Consortium for Health Outcomes Measurement (ICHOM) Complications in Hand and Wrist Conditions framework, which categorizes complications into three grades based on severity and required interventions. Grade 1 covers deviations from the usual recovery process that do not require surgical or radiologic procedures. Grade 2 includes deviations that require pharmacologic treatment, such as antibiotics or steroid injections. Grade 3 comprises complications necessitating surgical intervention, complex regional pain syndrome (CRPS), or persistent issues unresponsive to conservative or medical management.¹⁴

STATISTICAL ANALYSIS

All statistical analyses were performed using SPSS software (IBM Corp., 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp.). Descriptive statistics were used to summarize demographic and clinical characteristics.

RESULTS

This study included 57 patients aged ≥ 90 years undergoing open trigger finger release, with the average duration of symptoms being 5 months (interquartile range (IQR): 3-12 months). Mean age at the time of surgery was 92 years (standard deviation (SD) = 2.0), and the median follow-up duration was 2 weeks (IQR: 2-3 weeks). The most commonly affected finger was the middle finger (35%), followed closely by the ring finger (33%). According to Green's classification, most patients were Grade II (33 patients, 58%). Prior corticosteroid injection was documented in 42 cases (74%). Baseline demographics and comorbidities are summarized in [Table 1](#).

Local anesthesia was used in 56% (32 patients), followed by Monitored Anesthesia Care (MAC) with local anesthesia in 42% (24 patients). Only 1 patient (2%) received general anesthesia.

POSTOPERATIVE OUTCOMES

Complications were classified according to the International Consortium for Health Outcomes Measurement (ICHOM) Complications in Hand and Wrist Classification in 57 procedures with complete data. No systemic medical or major local complication was recorded. Two patients (3.5%) had a Grade 2 complication, including a wound infection requiring antibiotics. No Grade 3 complications were observed. [\[Table 2\]](#)

Patient satisfaction was high, with 95% of respondents (54 individuals) reporting satisfaction with their surgical outcomes.

DISCUSSION

This study evaluated the safety and early postoperative outcomes of open trigger finger release in a cohort of patients aged 90 years and older. The principal finding is that the procedure demonstrated a favorable short-term safety profile in this population, with no major complications observed and a low rate of minor complications (3.5%), all of which were limited to superficial wound infections managed nonoperatively. In addition, patient-reported satisfaction was high (95%), suggesting that symptom relief and overall patient perception of success remain excellent even in very elderly individuals.

A key consideration when interpreting complication rates following trigger finger release is distinguishing true complications from expected postoperative findings. Previous studies have demonstrated that inclusion of transient symptoms such as stiffness, scar tenderness, or mild

Table 1. Baseline Characteristics of Patients

Variable	Mean	SD
Age: years	92	2
BMI: Kg/m ²	26	4.6
	Median	IQR
Follow-up time: weeks	2	2-3
	Median	IQR
Symptom duration: months	5	3-12
	n	%
Sex: Female	42	74
Race:		
White	50	88
African American	3	5
Others	4	7
Dominant hand affected	33	58
Affected finger:		
Thumb	2	3.5
Index	2	3.5
Middle	20	35
Ring	19	33
Little	2	3.5
Multiple fingers	12	21
Comorbidities:		
Cardiac disease	21	37
Hypertension	28	49
Thyroid disease	11	19
Diabetes	11	19
Lung Disease	5	9
CKD	5	9
Neurologic disease (TIA, stroke, Dementia)	6	11
Cancer	14	25
Prior corticosteroid injection (Yes)	42	74
Type of anesthesia:		
Local	32	56
MAC with Local	24	42
General	1	2
Green classification:		
Grade I	3	5.3
Grade II	33	58
Grade III	7	12
Grade IV	14	25

Abbreviations: BMI, Body Mass Index; SD, Standard Deviation; interquartile range, IQR; IV, Intravenous; MAC, Monitored Anesthesia Care.

swelling, which are often part of the normal healing process, can substantially inflate reported complication rates.⁶ In the present study, complications were defined based on clinical relevance and the need for intervention, in alignment with the ICHOM framework. This approach may partly explain the relatively low complication rate observed, as minor, self-limited postoperative symptoms that

did not require intervention were not classified as complications.

The findings of this study are consistent with prior literature suggesting that open A1 pulley release is a low-risk procedure across a wide range of patient populations.^{1,5,7,9,15} Everding et al., in a retrospective series of 795 digits with a mean follow-up of 9 months, reported a 12% complication rate, the majority of which were minor and managed non-

Table 2. Postoperative complications and patient satisfaction.

Variable	N	%
Medical complication	0	0
Major local complication	0	0
Minor local complication:	2	3.5
Wound infection/dehiscence	2	3.5
Patient satisfaction	54	95

operatively. To evaluate the factor of age, they categorized patients into three age groups: under 50, between 50 and 70, and over 70. The univariate analysis revealed no significant association between age and complication rates (p -value: 0.69).² These findings support our results and suggest that age, in isolation, may not be a critical determinant of postoperative outcomes in trigger finger release procedures.

Similarly, a large multicenter cohort study by Koopman et al. reported a complication rate of 16%, with most events classified as low-grade and requiring minimal intervention.¹² The variability in reported complication rates across studies is likely attributable to differences in complication definitions, follow-up durations, and patient selection. Importantly, the absence of major complications in the current study should be interpreted with caution, as the relatively small sample size and short follow-up duration limit the ability to detect rare or delayed adverse events.

Risk factors for complications following trigger finger release remain an area of ongoing investigation. Prior studies have identified factors such as corticosteroid injection timing, diabetes, smoking, and dominant hand involvement as potential contributors to increased complication rates.^{2, 8, 16} Matzon et al.⁸ demonstrated that corticosteroid injections administered within 90 days prior to surgery were associated with an increased risk of postoperative infection. Similarly, Ng et al.¹⁶ identified steroid timing and smoking as significant predictors of surgical site complications. In contrast, Everding et al.² did not find a significant association between recent corticosteroid injection and complication rates. In the present study, despite a high prevalence of prior corticosteroid injections (74%), no cases of deep infection were observed, suggesting that other factors, such as injection timing or patient selection, may play a more critical role than injection history alone.

The impact of diabetes on postoperative outcomes has also been inconsistently reported. While some studies have not identified diabetes as a significant risk factor, others, including a matched case-control study by Federer et al.,¹⁷ have demonstrated more than a twofold increase in the risk of postoperative complications among diabetic patients. Similarly, Bruijnzeel et al.,⁶ in a large retrospective cohort of 1,598 trigger finger releases, reported that diabetes was associated with an increased risk of wound-related complications, delayed recovery of motion, and recurrence. Although the present study did not specifically analyze risk factors due to the low number of complications, these findings highlight the importance of considering patient co-

morbidities when counseling elderly individuals regarding surgical outcomes.

In addition to patient-related factors, perioperative variables may influence outcomes. Everding et al.² reported higher complication rates in cases performed under sedation or general anesthesia, potentially due to the inability to actively assess tendon gliding intraoperatively. In contrast, procedures performed under local anesthesia allow real-time confirmation of complete release, which may reduce the likelihood of persistent or recurrent symptoms. In the current cohort, the majority of procedures were performed under local anesthesia or monitored anesthesia care, which may have contributed to the favorable outcomes observed.

The present study provides important insight into a population that is underrepresented in the literature. Most existing studies on trigger finger release focus on younger or mixed-age cohorts, with limited data specifically addressing nonagenarians. Advanced age is typically associated with decreased physiologic reserve, increased frailty, and a higher burden of comorbidities, all of which may theoretically increase surgical risk. However, the findings of this study suggest that, when appropriately selected, nonagenarian patients can tolerate open trigger finger release well, with a low risk of early postoperative complications. These results support the notion that chronological age alone should not be considered a contraindication to surgical intervention.

Despite these strengths, this study has several important limitations. First, the retrospective design introduces the potential for selection and information bias. Second, the relatively small sample size limits statistical power and precludes meaningful subgroup or risk factor analysis. Third, and most importantly, the short follow-up duration (median 2 weeks) significantly limits the ability to capture delayed complications, including recurrence, persistent triggering, stiffness, or complex regional pain syndrome. As such, the findings of this study should be interpreted as reflecting early postoperative safety rather than long-term outcomes. Additionally, some patients did not have follow-up beyond their initial postoperative visit. Although all available medical records were reviewed to assess wound status, range of motion, analgesic use, and need for therapy, the reasons for loss to follow-up remain unclear, and the possibility of unreported complications cannot be excluded. Finally, the absence of standardized functional outcome measures limits the ability to assess objective functional improvement.

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DECLARATION OF CONFLICT OF INTEREST

The authors do NOT have any potential conflicts of interest for this manuscript.

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DECLARATION OF ETHICAL APPROVAL FOR STUDY

the study is approved under IRB # 13D.432 on 1/12/2026 by Thomas Jefferson's IRB

DECLARATION OF INFORMED CONSENT

There is no information (names, initials, hospital identification numbers, or photographs) in the submitted manuscript that can be used to identify patients.

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