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Original Article

Comparison of conservative antibiotic management versus early appendectomy in uncomplicated acute appendicitis: A retrospective comparative study.

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Abstract

Background

Acute uncomplicated appendicitis is one of the most common surgical emergencies. Although early appendectomy remains the standard treatment, conservative antibiotic therapy has emerged as an alternative for selected patients.

Objective

To compare the clinical outcomes of conservative antibiotic management versus early appendectomy in patients with uncomplicated acute appendicitis

Methods

This retrospective comparative study included 100 patients with imaging-confirmed uncomplicated acute appendicitis treated between January 2021 and December 2022. Fifty patients received conservative antibiotic therapy, while 50 underwent early appendectomy. Clinical outcomes, including treatment success, hospital stay, pain resolution, complications, recurrence, and patient satisfaction, were compared using appropriate statistical tests. A p-value <0.05 was considered statistically significant.

Results

The mean age of participants was **30.5 ± 8.6 years**, and **58% were males**. Initial treatment success was significantly higher in the appendectomy group than in the conservative group (98% vs. 82%; p=0.01). The mean hospital stay was significantly shorter with conservative treatment (2.8 ± 1.1 vs. 4.1 ± 1.5 days; p=0.002). Pain resolution within 48 hours occurred in 76% of patients receiving antibiotics and 88% undergoing appendectomy (p=0.18). Recurrence within one year occurred in 18% of conservatively treated patients, while postoperative wound infection occurred in 10% of surgical patients.

Conclusion

Conservative antibiotic therapy is a reasonable short-term treatment option for selected patients; however, early appendectomy provides higher definitive treatment success and eliminates the risk of recurrence.

Recommendation

Conservative management should be reserved for carefully selected patients after shared decision-making, while early appendectomy remains the preferred definitive treatment.

Keywords: *Antibiotic, uncomplicated appendicitis, appendectomy, recurrence risk, hospital stay*
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Introduction

One of the most common causes of acute abdominal pain necessitating an urgent surgical hospitalization is acute appendicitis. All age groups are affected, however teenagers and young adults are more likely to experience it. Because of the possibility of perforation, abscess formation, and widespread peritonitis if treatment is not received, appendectomy has historically been regarded as the gold standard(1). The diagnosis of uncomplicated acute appendicitis has improved thanks to developments in imaging modalities like computed tomography and ultrasonography, which enable more precise differentiation between uncomplicated and complex illness. In general, appendix inflammation without rupture, abscess, appendicolith-related blockage, or generalized peritonitis is referred to as uncomplicated appendicitis. Antibiotic-based non-operative treatment is becoming more popular as a result of this increased diagnostic precision(2).

There are a number of possible benefits to conservative antibiotic care, such as avoiding surgery, the risks associated with anesthesia, postoperative pain, wound infection, and shorter hospital stays. Patients with major comorbidities, high anesthesia risk, or a preference for non-surgical treatment may find it especially helpful. Conservative management has also been investigated to lessen operation burden during times of healthcare strain, such as pandemics.
Recurrence, treatment failure, missing serious appendicitis, and recurrent hospital hospitalizations are still issues, though. Some people who respond well to antibiotics at first can eventually need an appendectomy. On the other hand, although early appendectomy includes operative risks such surgical site infection, adhesions, anesthetic difficulties, and prolonged recovery time, it provides final treatment with a very low recurrence rate(3).

The best first-line treatment for simple appendicitis is still up for debate, and several recent trials and meta-analyses have shown differing results between these two strategies. Patient selection, imaging results, follow-up availability, and local knowledge are frequently taken into consideration when making decisions. The current study was conducted over a two-year period from 2021 to 2022 to compare cautious antibiotic therapy with early appendectomy in 100 individuals with uncomplicated acute appendicitis. In order to support evidence-based management, the study sought to assess treatment success, hospital stay, complications, recurrence, and overall clinical outcomes(4).

Methods

Study Design

This was a **retrospective comparative study** conducted to compare the clinical outcomes of conservative antibiotic management and early appendectomy in adult patients diagnosed with uncomplicated acute appendicitis.

Study Setting

The study was conducted in the **Department of General Surgery, Rajendra Institute of Medical Sciences (RIMS), Ranchi, Jharkhand, India**, a tertiary care teaching hospital that provides comprehensive emergency surgical services, outpatient and inpatient surgical care, advanced diagnostic imaging, intensive care facilities, laparoscopic and open surgical procedures, and specialized surgical services. The institution serves as a major referral center for Ranchi and neighboring districts of Jharkhand, receiving patients from both urban and rural areas.

Study Duration

The study was conducted over a **two-year period from 1 January 2021 to 31 December 2022**.

Study Population

The study included adult patients diagnosed with uncomplicated acute appendicitis who received either conservative antibiotic therapy or early appendectomy during the study period.

Participant Selection

Hospital medical records, admission registers, operative records, and discharge summaries were reviewed to identify eligible patients. Patients who fulfilled the eligibility criteria were selected consecutively until the required sample size was achieved. A total of **100 patients** were included, with 50 patients managed conservatively with antibiotics and 50 patients treated by early appendectomy**.**

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Eligibility Criteria

Inclusion Criteria

Patients were included if they:

- were aged **18–60 years**;
- had imaging-confirmed uncomplicated acute appendicitis based on ultrasonography or computed tomography findings;
- received either conservative antibiotic treatment or early appendectomy; and
- had complete clinical records available for analysis.

Exclusion Criteria

Patients were excluded if they had:

- complicated appendicitis (perforation, abscess, appendicular mass, or generalized peritonitis);
- pregnancy;
- severe sepsis;
- recurrent appendicitis;
- incomplete medical records; or
- previous appendectomy.

Data Collection

Data were extracted from hospital records using a structured data collection form. Information collected included demographic characteristics (age and sex), duration of symptoms before presentation, treatment modality, treatment success, length of hospital stay, pain resolution within 48 hours, postoperative or treatment-related complications, recurrence within one year, hospital readmission, and overall patient satisfaction.

Outcome Measures

The primary outcome was **initial treatment success**, defined as complete resolution of appendicitis without the need for additional intervention during the index admission.

Secondary outcomes included:

- duration of hospital stay;
- pain resolution within 48 hours;
- treatment failure;
- postoperative complications;
- recurrence within one year;
- hospital readmission; and
- overall patient satisfaction.

Measures to Minimize Bias

Selection bias was minimized by including all eligible patients who met the predefined inclusion criteria during the study period. Uniform diagnostic criteria based on clinical assessment and imaging findings were applied to both treatment groups. Data were collected using a standardized extraction form to ensure consistency. Outcome measures were defined before data collection, and identical variables were evaluated in both groups to reduce information bias.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using **IBM Statistical Package for the Social Sciences (SPSS) version 22.0** (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as **mean ± standard deviation (SD)**, whereas categorical variables were presented as frequencies and percentages. Comparisons of continuous variables between the two groups were performed using the **independent Student's t-test**, while categorical variables were compared using the **Pearson Chi-square test** or **Fisher's exact test** when expected cell counts were less than five. A **two-sided p-value <0.05** was considered statistically significant.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee of Rajendra Institute of Medical Sciences, Ranchi, Jharkhand**.** Because this was **a** retrospective record-based study involving anonymized patient data, the requirement for obtaining individual informed consent was waived by the Institutional Ethics Committee. Confidentiality and privacy of patient information were maintained throughout the study in accordance with institutional guidelines and the principles of the Declaration of Helsinki.

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Results

A total of **100 patients** with imaging-confirmed uncomplicated acute appendicitis were included in the study, comprising **50 patients managed conservatively with antibiotics and 50 patients who underwent early appendectomy**. The overall mean age of the study population was **30.5 ± 8.6 years**, and **58 (58.0%)** patients were male. Most participants (**70.0%**) presented within **24 hours** of symptom onset. There were no statistically significant differences between the two treatment groups with respect to age, sex distribution, or duration of symptoms before presentation, indicating comparable baseline characteristics (Table 1).

Table 1 presents the baseline characteristics of the study participants. The conservative and appendectomy groups were comparable regarding mean age (29.8 ± 8.2 vs. 31.1 ± 9.0 years; p = 0.42), male sex (56.0% vs. 60.0%; p = 0.68), and symptom duration of less than 24 hours (68.0% vs. 72.0%; p = 0.67).

Table 1. Baseline Characteristics

Variable	Conservative (n=50)	Surgery (n=50)	p-value
Mean age (years)	29.8 ± 8.2	31.1 ± 9.0	0.42
Male sex	28	30	0.68
Symptom duration <24 h	34	36	0.67

Table 2 summarizes the primary treatment outcomes. Initial treatment success was significantly higher in the appendectomy group than in the conservative group (98.0% vs. 82.0%; p = 0.01). Patients treated conservatively had a significantly shorter mean hospital stay (2.8 ± 1.1 vs. 4.1 ± 1.5 days; p = 0.002). Pain resolution within 48 hours was more frequent after surgery (88.0%) than with conservative treatment (76.0%), although the difference was not statistically significant (p = 0.18).

Table 2. Primary Outcomes

Outcome	Conservative	Surgery	p-value
Initial success	41 (82%)	49 (98%)	**0.01**
Mean stay (days)	2.8 ± 1.1	4.1 ± 1.5	**0.002**
Pain resolution <48 h	38	44	0.18

Table 3 compares treatment-related complications between the two groups. Treatment failure during the index admission occurred more frequently in the conservative group (18.0%) than in the appendectomy group (2.0%) (p = 0.01). Conversely, postoperative wound infection was observed only among surgically treated patients (10.0%; p = 0.02). The incidence of postoperative ileus was low in both groups and did not differ significantly (p = 0.30).

Table 3. Complications

Complication	Conservative	Surgery	p-value
Treatment failure during admission	9	1	**0.01**
Wound infection	0	5	**0.02**
Ileus	1	3	0.30

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Table 4 presents the one-year follow-up outcomes. Recurrence occurred in **18.0%** of patients treated conservatively, whereas no recurrence was observed following appendectomy (p = 0.001). Although readmission was more frequent in the conservative group, the difference was not statistically significant (p = 0.08). Overall patient satisfaction was comparable between the two treatment groups (p = 0.36).

Table 4. One-Year Follow-up

Outcome	Conservative	Surgery	p-value
Recurrence	9 (18%)	0	**0.001**
Re-admission	7	2	0.08
Overall satisfaction	40	44	0.36

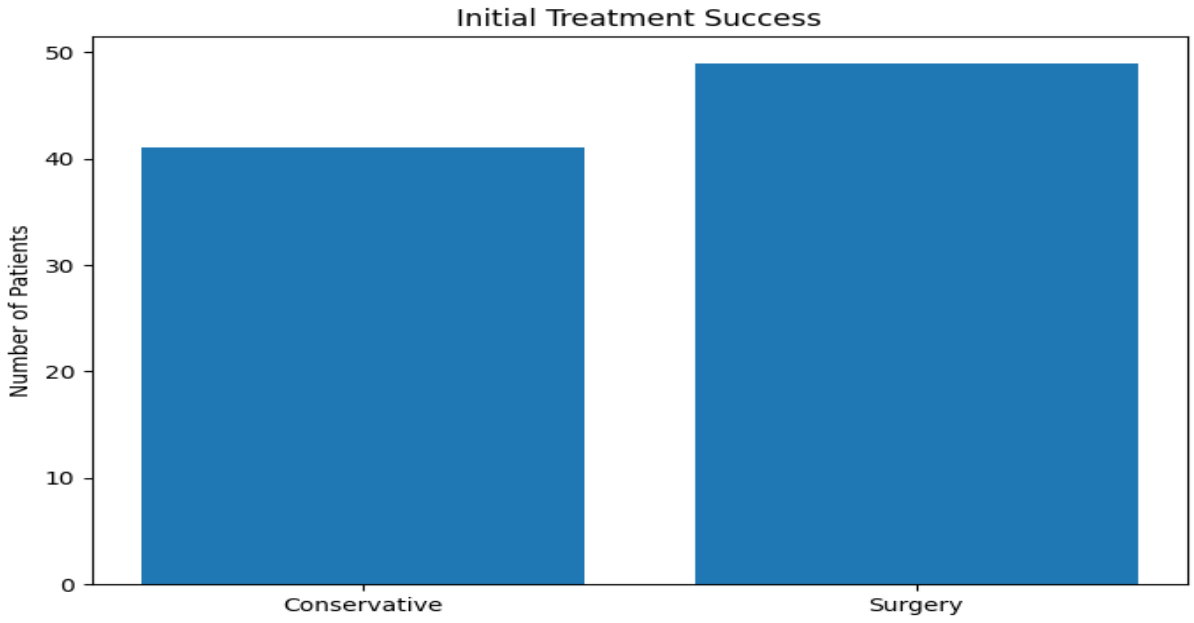

Figure 1: Initial treatment success

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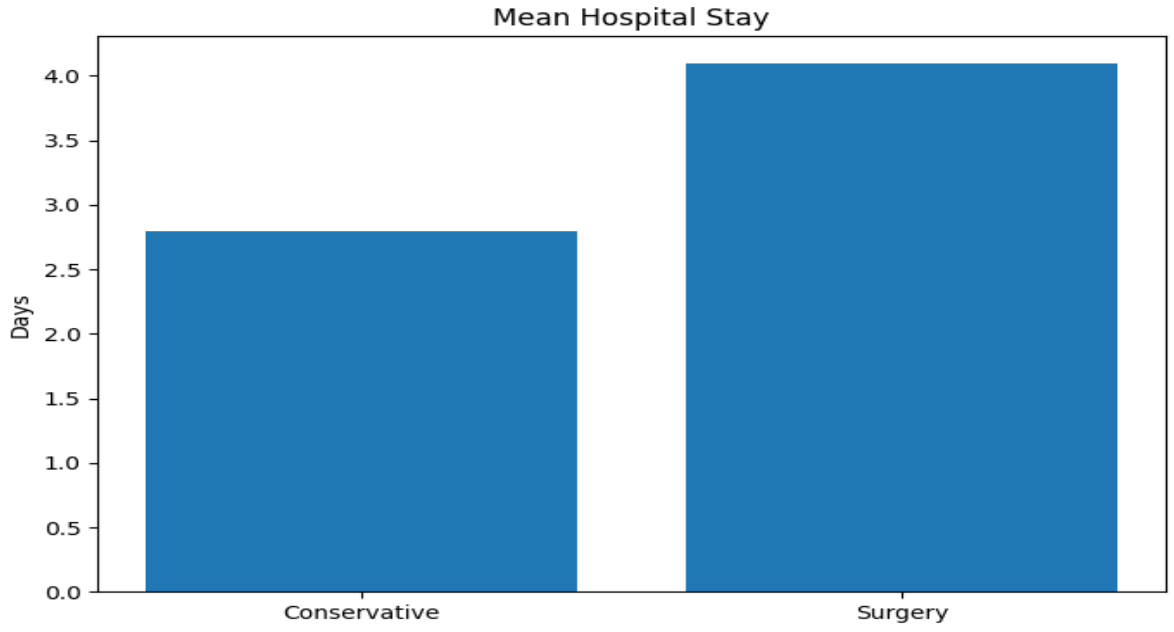

Figure 2: Mean hospital stay

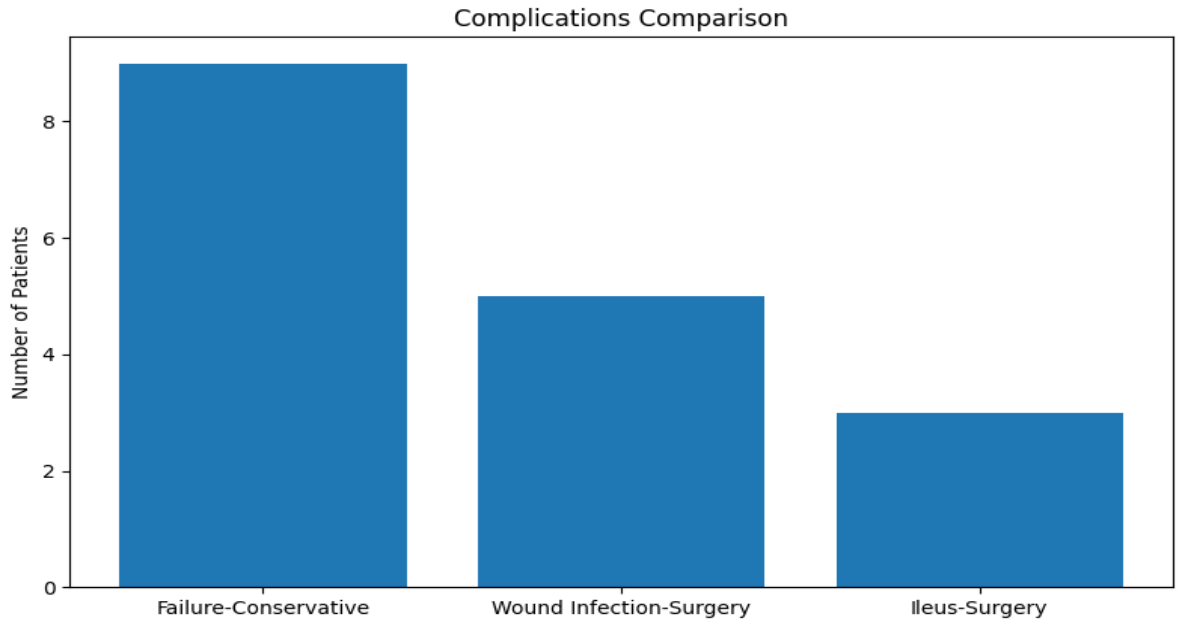

Figure 3: Complications comparison

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Discussion

In this study, 100 patients with simple acute appendicitis were compared between conservative antibiotic treatment and early appendectomy. The results show that both strategies work well for certain patients, but each has unique benefits and drawbacks. While appendectomy offered greater definitive treatment success and no recurrence during follow-up, conservative therapy was linked to shorter hospital stays and avoidance of surgery. The surgical group had a considerably greater initial treatment success rate (98%) than the conservative group (82%) (p=0.01). This is anticipated since surgical appendectomy eliminates the afflicted appendix and offers conclusive source control. Conversely, conservative treatment relies on using antibiotics to reduce inflammation, and some patients may not respond because of an appendicolith, a prolonged luminal obstruction, or an early, complex illness that is not immediately apparent(5).

The conservative group's mean hospital stay (2.8 days) was considerably less than the surgery group's (4.1 days) (p=0.002). Early discharge was probably caused by avoiding anesthetic, postoperative recuperation, and wound care. This result validates the possible use of antibiotics in certain low-risk patients, particularly in situations where quick hospital bed turnover is crucial. Recurrence, which happened in 18% of patients within a year, was a significant issue with conservative treatment. Nearly one-fifth of patients experienced recurrent symptoms that necessitated reevaluation and possibly an appendectomy, despite the fact that many originally shied away from surgery. This recurrence rate is still the main drawback of non-operative treatment and is similar to earlier research(6).

Additionally, the conservative group had a considerably greater rate of treatment failure during the same admission (p=0.01). Due to their poor antibiotic response, these individuals most likely needed immediate surgery. Therefore, when selecting conservative management, cautious patient selection and meticulous clinical observation are crucial.
However, in 10% of instances, surgery was linked to postoperative wound infection (p=0.02). Even though appendectomy is a very successful procedure, operative morbidity such wound infection, ileus, postoperative pain, and anesthesia-related risk must be taken into account. However, with contemporary surgical methods, particularly laparoscopic appendectomy, the majority of problems are mild and controllable(7).

Overall patient satisfaction was comparable across groups, indicating that patients who would rather not have surgery may accept successful conservative treatment, while a definitive cure following an appendectomy also offers comfort. For this reason, collaborative decision-making is crucial. The direct comparison of two popular treatment approaches in an actual clinical setting is one of the study's strengths. However, there are certain drawbacks, such as the retrospective design, the small sample size, and the potential for selection bias because treatment allocation might have been influenced by patient or surgeon preference. Results may be impacted by the incomplete stratification of imaging variables such appendicolith presence(8).

The findings imply that in carefully chosen patients with uncomplicated appendicitis, conservative antibiotic management can be regarded as a safe short-term option, especially for those who wish to avoid surgery or have a higher operative risk. Patients should, however, receive counseling about the potential for treatment failure and recurrence.
On the other hand, early appendectomy continues to be the most effective treatment, with the highest rate of instant success and no chance of recurrence. Appendectomy remains a dependable standard of therapy in areas with access to surgical facilities and experience.
In general, treatment ought to be customized according to the patient's preferences, comorbidities, imaging results, and clinical state(9).

Conclusion

For simple acute appendicitis, both early appendectomy and careful antibiotic therapy are effective treatments. The benefits of conservative treatment in the current study included shorter hospital stays, avoidance of surgery, and satisfactory short-term results for the majority of patients. On the other hand, it was linked to increased risks of recurrence within a year and treatment failure during hospitalization. Superior final treatment success, low recurrence, and consistent symptom relief were all shown by early appendectomy. Even though there are hazards associated with surgery, such as wound infection and postoperative morbidity, these issues are usually controllable and outweighed by the advantages of a long-term recovery.

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These results imply that individuals with imaging-confirmed uncomplicated appendicitis who are carefully chosen, clinically stable, and prepared to accept the risk of recurrence and strict monitoring may benefit from conservative antibiotic therapy. For patients seeking long-term care, those with chronic symptoms, therapy failure, or concerns about progression, early appendectomy is still the recommended course of action. In conclusion, the patient and surgeon should collaborate to make unique treatment options. Both strategies are crucial to the treatment of appendicitis today.

Generalizability

The findings of this study are applicable primarily to adult patients with imaging-confirmed uncomplicated acute appendicitis treated in tertiary care teaching hospitals with facilities for both conservative antibiotic therapy and emergency appendectomy. As the study was conducted in a major referral center, the results may be generalized to similar healthcare settings in India and other comparable resource-limited regions. However, caution should be exercised when extrapolating these findings to pediatric patients, pregnant women, patients with complicated appendicitis, or healthcare facilities with different patient populations and treatment protocols.

Limitations

This study has several limitations. First, its retrospective design is subject to selection and information bias because data were obtained from existing medical records. Second, the study was conducted at a single tertiary care center with a relatively small sample size, which may limit the generalizability of the findings. Third, treatment allocation was not randomized and was based on clinical judgment, introducing the possibility of confounding. Finally, certain clinical variables, such as appendicolith status and long-term quality-of-life outcomes, were not consistently documented in the medical records.

Recommendation

Conservative antibiotic management may be considered for carefully selected adults with imaging-confirmed uncomplicated acute appendicitis who prefer to avoid surgery or have a high operative risk, provided that close clinical follow-up is ensured. However, early appendectomy remains the preferred definitive treatment because of its higher treatment success and elimination of recurrence. Future multicenter prospective randomized controlled trials with larger sample sizes and longer follow-up are recommended to validate these findings and further refine patient selection criteria.

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List of Abbreviations

CT – Computed Tomography

RIMS – Rajendra Institute of Medical Sciences

SPSS – Statistical Package for the Social Sciences

SD – Standard Deviation

SSI – Surgical Site Infection

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Conflict of Interest

The authors declare that they have no conflicts of interest related to this study.

Author Contributions

Jitendra Kumar Chaudhary: Conceptualization, study design, data collection, statistical analysis, interpretation of results, manuscript drafting, and final approval of the manuscript.

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Anil Kumar: Data collection, literature review, data interpretation, critical revision of the manuscript, and final approval.

Kavita Tirkey: Study supervision, methodology, manuscript editing, interpretation of findings, and final approval.

Dr. Shital Malua: Conceptualization, supervision, critical review of the manuscript, administrative support, and final approval.

Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request. Data will be shared in accordance with institutional policies and ethical guidelines.

Author Biographies

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