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ORIGINAL RESEARCH

Comparative Study of Surgical Versus Conservative Management of Uncomplicated Acute Appendicitis

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ABSTRACT

Background: Uncomplicated acute appendicitis (UAA) is traditionally treated through surgical appendectomy. However, recent studies suggest that conservative management using antibiotics may be a viable alternative. This study aims to compare the clinical outcomes of surgical versus conservative management in patients diagnosed with UAA. **Materials and Methods:** A prospective, observational study was conducted involving 120 patients aged 18 to 50 years with radiologically confirmed UAA. Participants were divided into two equal groups: Group A (n=60) underwent laparoscopic appendectomy, while Group B (n=60) received intravenous antibiotics followed by oral antibiotics for 7 days. Patients were followed for 6 months to assess pain resolution, recurrence, length of hospital stay, complications, and return to normal activity. Statistical analysis was performed using the chi-square test and t-test with a significance level of $p<0.05$. **Results:** In Group A, 96.7% of patients achieved complete recovery without recurrence, whereas 83.3% in Group B had symptom resolution, but 16.7% experienced recurrence within 6 months. The average hospital stay was shorter in the surgical group (2.1 ± 0.6 days) compared to the conservative group (3.4 ± 0.9 days). Return to normal activity was faster in Group A (mean: 5.2 ± 1.3 days) compared to Group B (mean: 7.1 ± 1.5 days). Minor complications such as wound infections were observed in 6.7% of surgical cases, while gastrointestinal disturbances occurred in 8.3% of conservatively managed patients. **Conclusion:** Surgical management remains more definitive in treating UAA, offering lower recurrence and faster recovery. However, conservative treatment may be considered in selected patients who prefer non-operative options or are unfit for surgery, though with a higher chance of recurrence.

Keywords: Uncomplicated acute appendicitis, conservative management, laparoscopic appendectomy, antibiotic therapy, treatment outcomes, recurrence rate

INTRODUCTION

Acute appendicitis is one of the most frequent surgical emergencies encountered worldwide, with a lifetime risk of 7–8% in the general population (1). Traditionally, appendectomy has been the gold standard for managing acute appendicitis since its first description in the 18th century. However, recent clinical evidence suggests that not all cases require operative intervention, especially those categorized as uncomplicated acute appendicitis (UAA) (2). Uncomplicated cases are defined by the absence of perforation, abscess formation, or peritonitis, and they may be amenable to conservative treatment using antibiotics alone (3).

Over the past two decades, there has been growing interest in non-operative approaches, primarily driven by the desire to reduce surgical risks, hospital stays, and healthcare costs. Several randomized controlled trials and meta-analyses have evaluated the safety and efficacy of antibiotics in treating UAA and have demonstrated that a significant proportion of patients recover without surgery (4,5). Despite these findings, concerns persist regarding recurrence rates, delayed complications, and missed diagnosis of complicated appendicitis, which may adversely impact patient outcomes (6).

Hence, the clinical decision-making process requires a thorough evaluation of the benefits and drawbacks of both surgical and conservative modalities. The present study was undertaken to compare the outcomes of surgical appendectomy and antibiotic-based conservative management in patients with UAA, with a focus on recurrence, recovery time, complications, and hospital stay duration.

MATERIALS AND METHODS

This prospective, comparative study was conducted at the Department of General Surgery in *Travancore*

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Medical College, Kollam, Kerala over a period of 12 months. Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. All participants provided written informed consent before enrollment.

Inclusion Criteria

Patients aged between 18 and 50 years presenting with clinical symptoms of acute appendicitis and confirmed as uncomplicated on ultrasonography and/or contrast-enhanced computed tomography (CECT) were included. Uncomplicated appendicitis was defined as inflammation of the appendix without evidence of perforation, gangrene, abscess, or peritonitis.

Exclusion Criteria

Patients with complicated appendicitis, pregnancy, immunocompromised status, history of previous abdominal surgery, or known allergies to antibiotics used in the conservative group were excluded.

Study Groups and Intervention

A total of 120 patients who met the inclusion criteria were randomly assigned into two groups of 60 each using a computer-generated randomization table.

- **Group A (Surgical Group):** Patients underwent laparoscopic appendectomy under general anesthesia following standard operative protocols. Perioperative and postoperative care included intravenous fluids, antibiotics, analgesics, and wound care.
- **Group B (Conservative Group):** Patients received an initial intravenous course of antibiotics (e.g., ceftriaxone 1g BID and metronidazole 500 mg TID) for 48 hours, followed by a 5-day course of oral antibiotics (e.g., amoxicillin-clavulanic acid and metronidazole). Symptomatic management included analgesics and dietary modifications.

Follow-Up and Outcome Assessment

Patients were monitored during hospital stay for resolution of symptoms, complications, and length of stay. Follow-up evaluations were conducted at 1 week, 1 month, 3 months, and 6 months post-discharge. Outcomes assessed included recurrence of symptoms, requirement of delayed surgery, return to normal daily activity, and any adverse events or complications.

Statistical Analysis

Data were recorded using Microsoft Excel and analyzed with SPSS version 25.0. Quantitative variables such as hospital stay and recovery time were expressed as mean ± standard deviation and compared using Student's t-test. Categorical variables were compared using the Chi-square test or Fisher's exact test. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 120 patients were enrolled in the study and were equally divided into two groups (n = 60 each). The mean age of participants was 29.8 ± 8.2 years in Group A (surgical) and 30.6 ± 7.9 years in Group B (conservative), with no statistically significant difference in baseline characteristics ($p > 0.05$).

Clinical Outcomes

Symptom resolution was achieved in 58 patients (96.7%) in the surgical group compared to 50 patients (83.3%) in the conservative group ($p = 0.02$). Recurrence of symptoms was noted in 10 patients (16.7%) from Group B within 6 months, while no recurrence occurred in Group A (Table 1).

Hospital Stay and Recovery

The average hospital stay was significantly shorter in the surgical group (2.1 ± 0.6 days) compared to the conservative group (3.4 ± 0.9 days) ($p < 0.001$). Additionally, patients who underwent surgery returned to normal activities faster (mean 5.2 ± 1.3 days) than those managed conservatively (mean 7.1 ± 1.5 days) ($p < 0.01$) (Table 2).

Post-Treatment Complications

Minor complications such as wound infection occurred in 4 cases (6.7%) in Group A, whereas antibiotic-associated gastrointestinal symptoms (e.g., nausea and diarrhea) were observed in 5 patients (8.3%) in Group B. No major complications or mortality were reported in either group.

Table 1. Comparison of Clinical Outcomes Between Surgical and Conservative Groups

Parameter	Group A (Surgical)	Group B (Conservative)	p-value
Complete symptom resolution	58 (96.7%)	50 (83.3%)	0.020 *
Recurrence within 6 months	0 (0%)	10 (16.7%)	0.002 **

*Statistically significant
**Highly significant

Table 2. Comparison of Hospital Stay and Recovery Time

Parameter	Group A (Surgical)	Group B (Conservative)	p-value
Average hospital stay (days)	2.1 ± 0.6	3.4 ± 0.9	<0.001 **
Time to normal activity (days)	5.2 ± 1.3	7.1 ± 1.5	0.007 **

**Highly significant

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As observed in **Table 1** and **Table 2**, surgical management led to better outcomes in terms of symptom resolution, shorter hospitalization, and faster return to daily routines, whereas conservative treatment was associated with a higher recurrence rate and slightly prolonged recovery.

DISCUSSION

The findings of this study suggest that surgical management, specifically laparoscopic appendectomy, provides a more definitive treatment for uncomplicated acute appendicitis (UAA) compared to conservative management with antibiotics. The results are consistent with earlier literature that establishes appendectomy as the gold standard, with lower recurrence rates and quicker recovery (1,2).

In this study, 96.7% of patients undergoing surgery experienced complete symptom resolution with no recurrence during the follow-up period. In contrast, the conservative group had a recurrence rate of 16.7%. Similar outcomes were reported by Salminen et al., where 27% of conservatively treated patients experienced recurrent appendicitis within one year (3). This raises concerns about the long-term effectiveness of antibiotics alone in treating UAA.

However, the conservative approach demonstrated advantages such as non-invasiveness and avoidance of anesthesia-related risks, making it appealing for selected patient populations, particularly those with contraindications to surgery (4,5). Previous trials such as the APPAC study also showed that 72.7% of patients avoided surgery in the first year of conservative treatment (6), although long-term recurrence remains a concern.

The present study also found that hospital stay was longer and return to normal activities was slower in the conservative group. These findings align with those of Vons et al. and Hansson et al., who noted extended hospital stays in non-operative management due to ongoing observation and the need to manage recurrences or complications conservatively (7,8).

Complication rates in our study were relatively low and did not differ significantly between groups. Wound infections occurred in 6.7% of surgical patients, a rate comparable to that reported in other trials (9). On the other hand, gastrointestinal disturbances such as diarrhea and nausea affected 8.3% of conservatively managed patients, reflecting the adverse effects of broad-spectrum antibiotics (10).

Interestingly, recent meta-analyses have suggested that although antibiotic therapy may reduce immediate surgical risks, it carries a higher risk of late complications and repeated hospital admissions (11,12). Moreover, the inability to reliably differentiate between uncomplicated and early complicated appendicitis solely through imaging can complicate conservative decision-making (13). Diagnostic uncertainty and the risk of missing early perforation or gangrene reinforce the need for cautious patient selection in non-operative protocols (14,15).

CONCLSUION

In light of these findings, surgical management should remain the first-line treatment for most patients with UAA. However, with proper diagnostic support and informed consent, conservative treatment may be offered as an alternative in carefully selected cases. Long-term studies are still needed to evaluate the recurrence trends beyond one year and to refine criteria for non-surgical eligibility.

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