

ROLE OF CONSERVATIVE MANAGEMENT IN THE TREATMENT OF ACUTE UNCOMPLICATED APPENDICITIS

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ABSTRACT

Background: This study aimed to evaluate the efficacy of conservative management as an alternative to surgery in treating acute uncomplicated appendicitis, a common surgical emergency worldwide.

Objectives: To evaluate the efficacy and safety of conservative management as an alternative to appendectomy in adults with acute, uncomplicated appendicitis.

Study Design: A Prospective Cross-Sectional Study.

Place and Duration of study: Department of Surgical Unit at Medical Teaching Institute/Mardan Medical Complex from May to October 2024

Methodology: This prospective cross-sectional study was conducted in the surgical unit at Medical Teaching Institute/Mardan Medical Complex from May to October 2024. Using non-probability convenience sampling, 140 patients were included, as determined by the OpenEpi sample size calculator (5% margin of error). Participants with acute, uncomplicated appendicitis (Alvarado score > 5) were identified through clinical history, physical examination, and laboratory tests. Exclusions included patients with recurrent appendicitis or complicated cases involving perforation, abscesses, or peritonitis.

Results: A total of 140 patients with acute uncomplicated appendicitis were included in the study, comprising 83 (59.3%) males and 57 (40.7%) females. The age distribution was as follows: <20years (8.6%), 20–30 years (47.9%), 31–40 years (30.7%), and >40 years (12.9%), with a mean age of 29.4 ± 7.9 years. The mean duration of symptoms at presentation was 13.9 ± 8.2 hours. All patients received intravenous antibiotics, analgesics, and fluids for at least 48 hours. Conservative management was successful in 87 (62.1%) patients, while 38 (27.1%) experienced treatment failure, and 15 (10.7%) had recurrent acute appendicitis.

Conclusion: Our study highlights the effectiveness of conservative management in acute, uncomplicated appendicitis, with a success rate of 62.1% achieved with intravenous antibiotics, analgesia, and fluids. At the same time, 27.1% of patients required surgery due to treatment failure, and 10.7% experienced recurrence; most avoided immediate surgical intervention. This approach not only proves clinically effective but also offers substantial cost benefits.

Keywords: Acute uncomplicated appendicitis, Conservative management, Interval appendectomy, Treatment outcomes

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INTRODUCTION

Reginald Fitz, a pathologist at Harvard University, referred to the terms acute and chronic Appendicitis in 1886^(1, 2). Acute appendicitis represents one of the leading surgical emergencies encountered globally, having an estimated lifetime risk of nearly 7-8%⁽³⁾. Appendicitis is most prevalent in the second and third decades of life but can develop at any age⁽⁴⁾. Traditional therapy is appendectomy, either open or laparoscopic. The current developments in care, however, have led to a growing interest in conservative, non-surgical treatment, particularly in acute uncomplicated appendicitis (AUA)⁽⁵⁻⁷⁾. AUA is defined as inflammation of the appendix without perforation, abscess, or phlegmon formation, and can be confirmed through clinical, laboratory, and imaging criteria⁽⁸⁾. Conservative treatment, primarily through antibiotics, is now becoming a popular alternative to surgical intervention. Some studies have shown similarities in the outcomes of antibiotic treatment and appendectomy, with randomized controlled trials (RCTs) finding success rates of 70-80% for non-operative treatment⁽⁹⁻¹²⁾. The historic APPAC trial suggested that AUA might be successfully treated with antibiotics, thereby mitigating the urgency of surgical interventions and potentially reducing complications after surgery⁽¹³⁾. In addition, conservative treatment can be of great assistance in resource-limited contexts in which the surgical infrastructure is inadequate, as well as in patients with significant comorbidities who are high-risk surgical candidates^(14, 15). Nevertheless, concerns persist regarding the recurrence of appendicitis after antibiotic therapy. The studies have shown a recurrence rate of 15-30 per cent within a year and the need for appendectomy in some cases⁽¹⁶⁻¹⁸⁾. Moreover, the possibility of non-operative management of complex appendicitis and antibiotic resistance hinders the wide

utilization of this approach⁽¹⁹⁾. Accurate imaging with ultrasonography and computed tomography (CT) plays a critical role in confirming the diagnosis and selecting patients suitable for conservative management^(19, 20). The current research will assess the efficacy, safety, and outcomes of conservative care in AUA treatment. This study is expected to contribute to the growing body of evidence by evaluating success rates, recurrence rates, and patient-based outcomes of non-operative management as a credible alternative to surgery. Moreover, the research will delve into the factors associated with treatment success and how these factors would affect what happens in clinical practice guidelines⁽²¹⁾.

METHODOLOGY

This prospective cross-sectional observational study was conducted in the Surgical Unit of MTI Mardan Medical Complex Hospital over a period of six months, from May to October 2024. Ethical approval was obtained from the Institutional Ethics and Review Board of Bacha Khan Medical College/Mardan Medical Complex (Approval No: 231/BKMC, dated June 2022). A total sample size of 140 patients was calculated using OpenEpi software, based on an 89.8% success rate of conservative management for acute uncomplicated appendicitis, with a 95% confidence level and a 5% margin of error.

Adult patients aged 18 to 60 years diagnosed with acute uncomplicated appendicitis based on clinical evaluation, laboratory investigations, and ultrasonography findings, and who provided informed written consent, were included in the study. Patients with complicated appendicitis (including perforation, abscess, or peritoneal mass), a history of previous abdominal surgery, pregnant women, and those with severe

comorbid conditions such as diabetes mellitus or immunosuppression were excluded.

Patients were recruited from the surgical outpatient department. The diagnosis of acute uncomplicated appendicitis was established using the Alvarado scoring system (score >5), along with clinical, laboratory, and ultrasonographic findings. After explaining the purpose and risks of the study, informed written consent was obtained from all participants.

All patients were managed initially with conservative treatment, which included intravenous cefotaxime 1 g twice daily and intravenous metronidazole 500 mg every 8 hours, along with supportive care including fluids and analgesics. Patients who showed clinical improvement within 48 hours continued intravenous antibiotics for an additional 24 hours and were subsequently discharged on oral levofloxacin and metronidazole for a duration of seven days. Patients who did not respond to conservative management underwent appendectomy. All patients managed conservatively were followed up for six months to assess recurrence. Data were recorded using a structured proforma, including demographic characteristics, clinical presentation, treatment response, and outcomes.

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 24. Quantitative variables such as age, duration of symptoms, and hospital stay were presented as mean \pm standard deviation, while categorical variables such as gender, treatment outcomes, and recurrence were expressed as frequencies and percentages. Stratification was performed based on age and gender. The Chi-square test was applied to assess associations between categorical variables. A p-value of ≤ 0.05 was considered statistically significant, and confidence intervals were calculated at a

95% confidence level.

RESULTS

Among 140 patients with acute, uncomplicated appendicitis, 83 (59.3%) were male, and 57 (40.7%) were female. The age distribution is shown in Figure 1. The mean age was 29.4 ± 7.9 years (95% CI: 28.1–30.7). No statistically significant difference in mean age was found between males and females ($p = 0.053$). The mean duration of symptoms at presentation was 13.9 ± 8.2 hours (95% CI: 12.3–15.5). Pain in the right iliac fossa was reported in all cases (100%), while nausea and vomiting occurred in 80.4% (95% CI: 73.5–86.0), and anorexia in 69.4% (95% CI: 61.9–76.1). Fever was present in 86.4% (95% CI: 80.1–91.2, $p < 0.01$). Conservative management was successful in 87 (62.1%) patients (95% CI: 53.6–70.0, $p = 0.02$). Treatment failure occurred in 38 (27.1%) cases (95% CI: 19.9–35.5), while 15 (10.7%) experienced recurrence (95% CI: 6.5–16.9) as illustrated in Figure 2. Early presentation (<24 hours) demonstrated the highest success rate (63.8%, 95% CI: 55.1–71.7, $p = 0.03$), whereas delayed presentation (>24 hours) was associated with increased failure rates ($p = 0.04$) as shown in Table 1. No statistically significant association was found between gender and treatment outcomes ($p = 0.519$). Only 4 patients who did not respond to conservative management developed wound infections within 10 days of appendectomy, which resolved with a 5-day course of IV antibiotics and aseptic dressing. The mean hospital stay for conservatively managed patients was 4.26 ± 0.63 days (95% CI: 4.10–4.42). Patients who failed conservative management had a significantly longer hospital stay (mean: 6.1 ± 1.2 days, 95% CI: 5.8–6.4, $p < 0.01$).

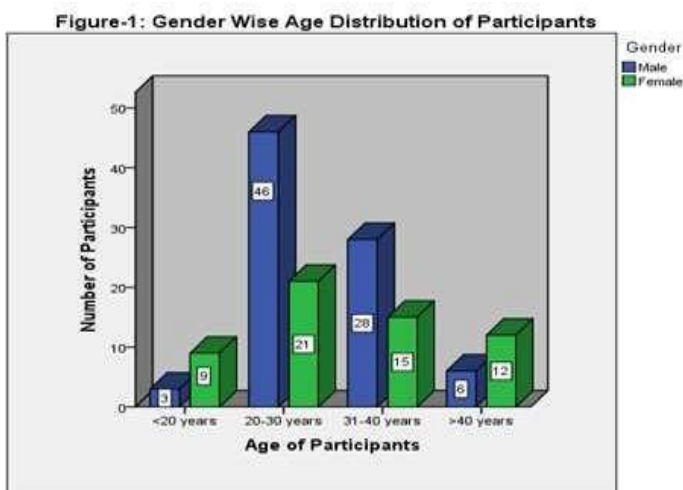


Figure 1. Gender-wise Age Distribution of Participants

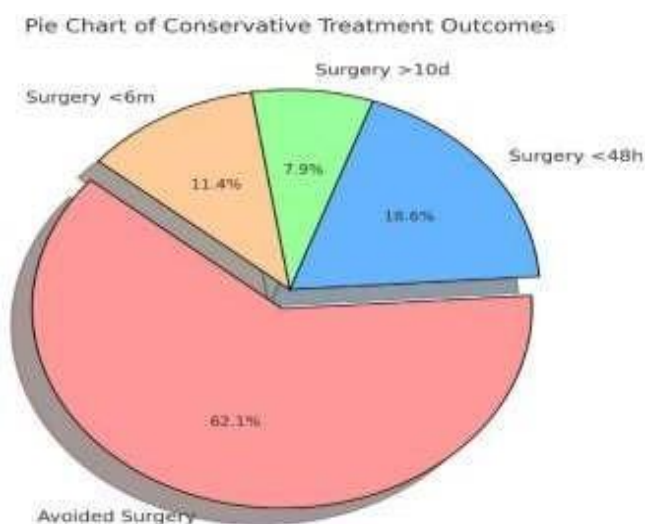


Figure 2: Pie Chart illustrating the long-term outcome of conservative Management

Table 1: Duration of Presenting Symptoms and their Outcome

Duration of Presenting Symptoms	Outcome			Total
	Successful	Treatment Failure	Recurrence	
<24 hours	81	32	14	127
24-48 hours	6	5	1	12
>48 hours	0	1	0	1

Total	87	38	15	140
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DISCUSSION

This study evaluated the efficacy of conservative treatment in acute uncomplicated appendicitis, with a focus on treatment success rates and the impact of symptom duration on outcomes. The male-to-female ratio in our study was 1.46:1, similar to a previous study where this ratio was 1.6:1 (23). Among 140 patients, 62% successfully avoided interval appendectomy, highlighting the potential benefits of nonsurgical management. Our findings are consistent with previous studies, which have reported similar success rates for conservative treatment of acute uncomplicated appendicitis (23, 24). Early presentation (<24 hours) was a critical factor of success, with a 63.8% success rate, while delayed presentation (>24 hours) led to greater failure rates as reported in Gedam PS et al. (22). These findings emphasize the important role of prompt intervention in enhancing conservative management outcomes. The lack of a statistically significant difference in mean age between genders (p= 0.053) shows that age and sex have little impact on treatment outcomes. This is consistent with previous studies stressing the significance of clinical presentation and prompt diagnosis rather than demographic characteristics in predicting outcomes (25). However, the average symptom duration of 13.9 ± 8.2 hours across individuals highlights the importance of early evaluation and therapy. The implications of these results are significant. Conservative management, when initiated promptly, may reduce the need for surgical intervention, minimizing healthcare costs, hospital stay durations, and potential postoperative complications. The results are congruent with the emergent evidence that supports tailored, individualised management of appendicitis. Finally, the research positively shows the efficiency of conservative treatment of acute uncomplicated appendicitis, mainly in those patients

present early enough.

These findings underscore the importance of early diagnosis and individualized patient care in the management of this common surgical condition. The study also has its limitations. To begin with, the sample used of 140 patients might not be big enough to provide a generalization to any wider population. Secondly, this short follow-up length (six months) precludes the assessment of long-term recurrence and complications. Thirdly, there can be selection bias since only those patients with acute uncomplicated appendicitis were recruited, and those with comorbidities or complicated cases were excluded. There was also reliance on patient recall of treatment adherence and symptoms, so there is high reliance on the recall agreement (bias). Finally, comparisons of conservative and surgical management can possibly be influenced by a lack of randomization. Future studies should include longer follow-up periods and larger, randomized trials.

CONCLUSION

The conservative approach is a promising therapeutic alternative to surgical treatment of acute non-complicated appendicitis, offering a nonsurgical

treatment modality. Conservative management was associated with symptom resolution and reduced complication rates in the majority of patients. This approach can reduce medical costs and the duration of convalescence. Nonetheless, rigorous patient selection and close follow-up are essential to ensure a positive outcome and reduce the development of complications.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

AUTHORS CONTRIBUTIONS

Concept & Design of Study: Wisal Khan

Drafting: Abdul Basit Khan

Data Analysis: Adil Ur Rehman

Critical Review: Jalal Ahmad, Muhammad Zeeshan Ali

Final Approval of version: All Mentioned Authors Approved.

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