

# CONSERVATIVE VERSUS OPERATIVE TREATMENT OF CLINICALLY SUSPECTED UNCOMPLICATED ACUTE APPENDICITIS

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## ABSTRACT

### *Background*

Acute appendicitis is one of the most frequent causes of an acute abdomen. There is an important controversy concerning the management of acute, uncomplicated appendicitis by surgery and nonsurgical means.

### *Objectives*

To evaluate the results of conservative treatment in cases of clinically uncomplicated acute appendicitis, starting with antibiotics as an initial step.

### *Patients and Methods*

A 2-year prospective study, from February 2021 to January 31, 2023, was conducted in Sulaimani Teaching Hospital in Sulaimani Governorate. Patients who presented with acute appendicitis within 72 hours of the onset of the symptoms and had an Alvarado score of  $\geq 5$  or more were included. The patients received therapeutic doses of broad-spectrum antibiotics in addition to symptomatic treatment. There was a follow-up period of six months.

### *Results*

Of the 54 patients enrolled in the study, the mean age was 34.4 years; 32 (60%) were female and 22 (40%) were male. Thirteen patients (24.4%) had unsuccessful conservative treatment, compared to 41 (75.6%) who were successful. There was no recorded mortality in this research. The complications that developed in patients who did not react well to conservative treatment Eight patients with acute suppurative appendicitis—one with a perforated appendix, two with an appendicular abscess, and two with an appendicular mass—were among the surgical patients.

### *Conclusion*

The majority of cases of uncomplicated acute appendicitis presented with a first attack can be successfully treated conservatively. On the other hand, conservative treatment needs good communication, vigilant observation, and frequent examination to detect failure that requires rapid surgical intervention.

**Keywords:** *Acute appendicitis, antibiotics, conservative treatment, Alvarado score, uncomplicated appendicitis..*

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## INTRODUCTION

One of the most frequent surgical emergencies faced in general surgery practice is acute appendicitis. Severe complications include mass, abscess, and perforation, in addition to widespread peritonitis. Because serious problems from appendectomy are rare, it is currently the preferred treatment, even in cases where the diagnosis has been suspected. Nevertheless, following removal, the appendix is discovered to be normal in 15–30% of instances<sup>(1, 2)</sup>. After an appendectomy, there are a number of risks that can occur, such as surgical site infection, adhesion-induced intestinal blockage, female tubal infertility, difficulties associated with anesthesia, and other general postoperative complications.

There are safety concerns when treating acute appendicitis without surgery. However, postponing surgery could raise the risk of perforation, resulting in localized or generalized peritonitis and intra-abdominal abscesses.

Compared to conservative treatment with antibiotics, surgery is associated with a longer hospital stay and higher costs; nevertheless, a perforated appendix and delayed treatment may aggravate morbidity, lengthen sick leave, and increase costs. Nonetheless, a significant portion of patients may find that nonoperative antibiotic treatment is a more cost-effective option than surgery without increasing risk and that it can reduce hospital stays and costs in developing and third-world nations<sup>(3)</sup>. There is substantial debate on conservative vs. surgical management in selected cases of acute appendicitis. Since there is a shortage of research on this topic to date<sup>(4,5)</sup>,

The concept of applying conservative treatment in certain cases of acute appendicitis is not new. “Treated in a purely medical or temporary manner, the great majority of patients with appendicitis recover,” Alfred Stengel noted in 1908<sup>(6)</sup>.

Other studies state that if antibiotics are administered, there is no worsening of morbidity, and an urgent appendectomy can be delayed for at least 24 hours.<sup>(7, 8)</sup>

According to some authors, the majority of patients with acute, uncomplicated appendicitis may not require an appendectomy because the condition usually goes away by itself without the need for surgery in many cases and may be treatable only using antibiotics in others<sup>(9)</sup>.

The advantages of this method include high success

and low recurrence rates, less pain, shorter hospital stays, lower costs, and sick leaves, as well as reduced morbidity and mortality<sup>(10)</sup>.

This study aimed to compare conservative treatment with antibiotics for uncomplicated acute appendicitis with surgical treatment and to evaluate treatment failure.

## PATIENTS AND METHODS

This two-year study was carried out in the Sulaimani Teaching Hospital. A total of 54 people were included in this study as a consequence of the inclusion and exclusion criteria. Every patient and their representatives signed a consent form. This study included all patients older than 16 with a history of right iliac fossa pain lasting less than 72 hours and radiological and clinical evidence of appendicitis for the first time with an Alvarado score of  $\geq 5$  as an additional tool (Table 1). Abdominal ultrasonography was performed on each patient to confirm the diagnosis of acute appendicitis and rule out other intra-abdominal possibilities.

The patients who were excluded include patients who presented with recurrent appendicitis, patients who refused conservative management, immunocompromised, pregnant, diabetics, hypertensives, and patients who presented with complicated appendicitis and in whom imaging showed faecolith, as well as patients who were lost during follow-up. Following their admission to the hospital, all patients who fulfilled the inclusion criteria were given intravenous antibiotics for at least 24 hours. These included metronidazole infusion three times a day, third-generation cephalosporins, cefotaxime or ceftriaxone, at a dose of 1 g twice daily, drinking or eating nothing by mouth, and intravenous fluids, with a chart recording the pulse rate, blood pressure, temperature, and local abdominal examination six hours a day. Individuals who showed improvement in less than a day were sent home with oral antibiotics (ciprofloxacin 500 mg twice a day and 500 mg of metronidazole three times a day). Patients who were not responsive to conservative management underwent surgery for an appendectomy.

Patients who showed improvement were instructed to get in touch right away if they experienced fever, vomiting, or a return of pain. These were followed up on over a period of six months. Patients were instructed to let us know if they had undergone surgery anywhere.

**Table 1. Alvarado Score.**

|                     |                      |    |
|---------------------|----------------------|----|
| Symptoms            | Migratory RIFpain    | 1  |
|                     | Anorexia             | 1  |
|                     | Nausea and vomiting  | 1  |
| Signs               | Tenderness (RIF)     | 2  |
|                     | Rebound Tenderness   | 1  |
|                     | Elevated Temperature | 1  |
| Laboratory findings | Leukocytosis         | 2  |
|                     | Shift to Left        | 1  |
| Total Score         |                      | 10 |

## RESULTS

In this study, 54 cases of uncomplicated acute appendicitis were included and managed conservatively. 32 (59.26%) patients were female, and 22 (40.74%) patients were male. The mean age was 34.2 years and ranged between 16 and 60 years. Table 2 shows the age distribution of the study. The maximum number of patients (40.74%) belonged to the age group of 20–29 years. Table 3 shows that 37 (68.52%) patients arrived at the hospital with signs and symptoms of acute appendicitis with a time interval of less than 24 hours, 12 (22.22%) patients arrived with a time interval of 24–48 hours, and 5 (9.26%) patients arrived with a time interval of 48–72 hours.

Table 3 shows that 37 (68.52%) patients arrived at the hospital with signs and symptoms of acute appendicitis with a time interval of less than 24 hours, 12 (22.22%) patients arrived with a time interval of 24–48 hours, and 5 (9.26%) patients arrived with a time interval of 48–72 hours. Of the 54 patients who had conservative treatment for uncomplicated acute appendicitis, 41 (75.93%) had favorable outcomes; the remaining patients

experienced treatment failure or recurrence over the 6-month follow-up period. Nonetheless, the conservative treatment did not work for the remaining 13 individuals (24.07%). Six patients (11.1%) had treatment failure during their original stay, whereas seven patients (12.9%) had recurrences after their primary admissions were effectively managed. (Table 4). Table 5 indicates that of the 13 patients who did not respond to conservative treatment, 6 underwent surgery within 2 days of starting treatment, 4 within 10 days of the treatment course ending, and 3 during the 6 months of follow-up. Eight patients with acute suppurative appendicitis, one with a perforated appendix, two with an appendicular abscess, and two with an appendicular mass, were among the patients who had the operation.

Table 6 illustrates our findings, which indicated that age, gender, and the length of appendicitis attacks did not significantly affect the outcomes of the conservative treatment.

Table 6. Results of conservative treatment were categorized by age, gender, and duration of appendicitis attacks.

**Table 2. The study's age distribution.**

| Age (years)  | patients' number | (%).     | Mean age     |
|--------------|------------------|----------|--------------|
| ≤19          | 4                | (7.42)   | 18           |
| 20–29        | 22               | (40.74)  | 24           |
| 30–39        | 15               | (27.78)  | 34           |
| 40–49.       | 10               | (18.51). | 43           |
| 50–60        | 3                | (5.55).  | 52           |
| <b>Total</b> | <b>54</b>        |          | <b>(100)</b> |

**Table 3. The number of patients based on how long their symptoms have been present.**

| Hours of appendicitis attack | Number of patients (%) |
|------------------------------|------------------------|
| ≤24 h.                       | 37 (68.52)             |
| 24–48 h.                     | 12 (22.22)             |
| 48–72 h.                     | 5(9.26)                |
| <b>Total</b>                 | <b>54 (100)</b>        |

**Table 4. Results of conservative treatment.**

| Results.                 | patients' number (%) |
|--------------------------|----------------------|
| <b>Responding</b>        | 41 (75.93)           |
| <b>Treatment failure</b> | 6 (11.11)            |
| <b>Recurrence</b>        | 7(12.96)             |

**Table 5. Appendectomies following a conservative treatment trial.**

| Interval appendectomy time                       | No. of patients (n = 13) |
|--|--------------------------|
| <b>Operation following 48 hours of treatment</b> | 6                        |
| <b>Operation following 10 days of treatment</b>  | 3                        |
| <b>Operation within 6 months of the attack</b>   | 4                        |

**Table 6. Results of conservative treatment were categorized by age , gender, and duration of appendicitis attacks.**

| Different factors                             |               | Conservative treatment results in a p-value |                       |         |
|---|---------------|---|-----------------------|---------|
| Factors                                       |               | Success                                     | Failure               | p-value |
| <b>Gender.</b>                                |               |   |                       |         |
| <b>Male</b>                                   | <b>Female</b> | 16 (72.2%)<br>25(77.8%).                    | 6 (27.8%)<br>7(22.2%) | 0.7     |
| <b>Age group</b>                              |               |   |                       |         |
| <b>≤20.</b>                                   |               | 2 (66.7%)                                   | 1 (33.3%)             | 0.8     |
| <b>21–30</b>                                  |               | 20 (91.7%).                                 | 2 (8.3%)              |         |
| <b>31–40</b>                                  |               | 11 (75%)                                    | 4(25%)                |         |
| <b>41–50</b>                                  |               | 6(55.5)                                     | 5 (44.5%)             |         |
| <b>51–60.</b>                                 |               | 2(66.66)                                    | 1(33.33)              |         |
| <b>Hours of attack of appendicitis ≤24 h.</b> |               | 32 (86.7%)                                  | 5 (13.3%)             | 0.08    |
| <b>24–48 h.</b>                               |               | 7 (61.1%)                                   | 3 (38.9%)             |         |
| <b>48–72 h.</b>                               |               | 2 (33.3%).                                  | 5 (66.7%)             |         |

## **DISCUSSION**

One of the most common causes of an acute abdomen is acute appendicitis. Although appendectomy is generally considered the gold standard, antibiotic-based conservative treatment is becoming more and more acceptable. Conservative treatment with antibiotics has a number of advantages over surgical treatments. When surgical procedures are not available, especially in developing nations and faraway regions, antibiotics offer an opportunity to cure acute appendicitis. Surgery-related mortality and morbidity risks can be decreased with antibiotic treatment <sup>(11)</sup>. This approach has many advantages, including high success and low recurrence rates, reduced morbidity and mortality, less pain, shorter hospitalization and sick leave, and reduced costs <sup>(10)</sup>.

In this study, we relied on clinical judgment, laboratory investigations, imaging techniques, and Alvarado's score as additional tools for the diagnosis of acute appendicitis.<sup>(12)</sup>

Of the 54 patients in the current study, 41 (75.92%) received conservative treatment; six patients (11.11%) did not respond to conservative treatment and underwent surgery; and seven patients (12.96%) experienced a recurrence of appendicitis during the follow-up period. As a result, the failure rate was 24.7%, with a total of 13 patients failing to respond.

A comparable study conducted on 442 patients at Sahlgrenska University Hospital (between May 2009 and February 2010) revealed that 342 patients (77.4%) responded well to conservative treatment, while 100 patients (22.6%) did not respond to it. These findings are almost identical to our study findings <sup>(13)</sup>.

A follow-up study, involving a sample of thirty patients receiving conservative therapy at the surgical department of GMERS Medical College, Gandhinagar, between 2011 and 2013, showed that 21 patients (70%) successfully underwent conservative treatment, while nine patients (30%) did not react conservatively <sup>(14)</sup> Our findings are almost identical to theirs.

The outcomes of our study were comparable to those of a 2016 study conducted in India with 71 patients by Gedam PS. Et al., which revealed a successful rate of 74.65%, a treatment failure rate of 14.08%, and a recurrence rate of 13.11 <sup>(15)</sup>.

Our study results are also similar to a study done in the

Department of Surgery, Al-Kindy College of Medicine, University of Baghdad, Baghdad, Iraq, in 1918 by Mumtaz KH. Alnaser et al., which involved 90 patients showed a successful rate of 75.6% and a failure rate of 24.4%. <sup>(16)</sup>.

The long-term effectiveness of non-operative treatment for acute appendicitis was found to be 83% (118 patients) recurrence-free and 14 patients with recurrence, which is similar to a 1910 study by Di Saverio et al. <sup>(17)</sup>.

We used third-generation cephalosporins (ceftriaxone or cefotaxime) in addition to metronidazole. This was comparable to the majority of RCTs. Similar results were observed by Vons C et al. employing ampicillin plus gentamicin <sup>(18)</sup> and Turkan et al. employing amoxicillin plus clavulanic acid <sup>(19)</sup>. Mumtaz KH. Alnaser et al., using metronidazole and third-generation cephalosporin <sup>(16)</sup>.

Our findings demonstrate that the distribution of gender, differences in age groups, and differences in the period of condition presentation had no apparent effect on the results of conservative treatment for acute appendicitis.

## **CONCLUSION**

This study evaluated conservative treatment in clinically uncomplicated acute appendicitis and was conducted for a period of 2 years with follow-up of the cases for six months. We conclude that most patients with uncomplicated acute appendicitis can be successfully and safely treated with conservative treatment, avoiding appendectomy and the associated mortality and morbidity. They also experience less pain and lower costs.

However, to identify a failure in clinical status improvement, conservative treatment needs vigilant and close observation and reassessing the patient's status to see if they are responding to the treatment.

Recommendations: For patients with clinically uncomplicated appendicitis, conservative treatment of acute appendicitis can generally be a safe and successful approach. Before choosing this course of action, it is important to weigh the long-term effects and possible risks. More study is required to improve the management of acute appendicitis and to understand the advantages and disadvantages of conservative treatment.

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