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Analysis of the Efficacy and Effective Rate of Surgical and Conservative Treatment for Acute Appendicitis

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Abstract: *Objective*: Acute appendicitis, as a common clinical acute abdominal condition, has a significant impact on patient prognosis depending on the choice of treatment strategy. This study aims to systematically compare the clinical efficacy and safety of surgical versus conservative treatment in patients with acute appendicitis. *Methods*: A total of 60 patients with acute appendicitis admitted to our hospital from August 2024 to July 2025 were selected as the study subjects and divided into a surgical group (n = 30) and a conservative group (n = 30) based on the treatment approach. The surgical group underwent abdominal incision appendectomy, while the conservative group received antibiotic therapy combined with symptomatic supportive treatment. Evaluation indicators included the treatment effective rate, symptom relief time, and complication incidence. *Results*: The treatment effective rate in the surgical group was 96.67%, significantly higher than that in the conservative group (76.67%) ($p < 0.05$). In terms of symptom relief, the time to relief of abdominal pain (1.25 ± 0.36 days) and fever (1.08 ± 0.29 days) in the surgical group was significantly shorter than that in the conservative group (3.12 ± 0.57 days and 2.89 ± 0.61 days, respectively, $p < 0.001$). The complication rates in the two groups were 10.00% and 13.33%, respectively ($p > 0.05$). *Conclusion*: Surgical treatment for acute appendicitis demonstrates significant advantages in improving treatment efficacy and shortening the time to symptom relief, with a comparable risk of complications to conservative treatment. It is therefore worthy of clinical priority recommendation, particularly for patients without surgical contraindications.

Keywords: Acute appendicitis; Surgical treatment; Conservative treatment; Efficacy; Time to symptom relief

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1. Introduction

Acute appendicitis is one of the most common acute abdominal conditions in general surgery, with its pathogenesis primarily related to appendiceal lumen obstruction and bacterial invasion. If not promptly intervened, it can lead to serious complications such as abdominal abscesses and portal phlebitis, and may even be life-threatening [1,2]. Currently, clinical treatment for acute appendicitis mainly involves two approaches: surgical removal of the appendix

and conservative pharmacological treatment. Surgical treatment is widely applied due to its ability to directly remove the lesion, but some patients opt for conservative treatment due to advanced age, underlying medical conditions, or personal preference [3,4]. Based on this, this study took 60 patients with acute appendicitis admitted to our hospital from August 2024 to July 2025 as the research subjects, systematically compared the clinical effects of surgical and conservative treatments, and focused on analyzing the treatment efficacy rate and indicators related to symptom relief, aiming to provide high-quality clinical evidence for optimizing clinical treatment strategies. The research results are now reported as follows.

2. Data and methods

2.1. General information

A retrospective analysis was conducted on the medical records of patients with acute appendicitis who underwent emergency surgical treatment in our department from August 2024 to July 2025.

2.1.1. Inclusion criteria

(1) Meeting the diagnostic criteria in the "Guidelines for the Diagnosis and Treatment of Acute Appendicitis (2022 Edition)" [5]
(2) Normal laboratory test results; ultrasound indicates morphological changes in the appendix accompanied by tenderness and rebound tenderness
(3) Patients with clear etiologies and typical clinical manifestations before surgery

2.1.2. Exclusion criteria

(1) Patients with severe complications such as appendix perforation and diffuse peritonitis
(2) Patients with functional failure of vital organs such as the heart, liver, and kidneys who cannot tolerate surgery
(3) Pregnant and lactating women
(4) Patients who cannot use the experimental drugs due to other reasons
(5) Patients with malignant tumors or other diseases affecting prognosis and those with low immunity

2.1.3. Study design

They were divided into two groups based on different treatment methods: the surgical group (n = 30) consisted of 18 males and 12 females, aged between 18 and 65 years old with an average age of (38.5 ± 12.3); the disease duration ranged from 6 to 48 hours, with an average duration of (24.3 ± 8.5); the disease types included 16 cases of simple appendicitis and 14 cases of purulent appendicitis. The conservative group (n = 30) consisted of 17 males and 13 females, aged between 19 and 64 years old with an average age of (39.2 ± 11.8); the disease duration ranged from 8 to 46 hours, with an average duration of (23.8 ± 9.1); the disease types included 15 cases of simple appendicitis and 15 cases of purulent appendicitis. A comparison of general data between the two groups (all $p > 0.05$) indicated comparability. This study was approved by the hospital's ethics committee, and both patients and their families signed informed consent forms.

2.2. Treatment methods

2.2.1. Surgical group

All patients underwent abdominal incision appendectomy, with the specific procedure as follows: The patient was placed in a supine position. After continuous epidural anesthesia or general anesthesia, an oblique incision approximately 3–5 cm in length was made at the McBurney's point in the lower right abdomen. The skin, subcutaneous tissue, and external oblique aponeurosis were sequentially incised, followed by blunt dissection of the internal oblique and transverse abdominal muscles. The peritoneum was then incised to enter the abdominal cavity. Ligate the appendix with No. 4 silk thread at a point 0.5 cm from the cecum at the root of the appendix. Then, clamp and cut the appendix at a point 0.5 cm distal to the ligation site. The residual end is disinfected sequentially with carbolic acid, alcohol, and normal saline, and is embedded into the cecal wall using absorbable sutures (pouch embedding method). After checking for no bleeding or exudate and confirming that the surgical instruments and gauze are accounted for, close the abdominal cavity layer by layer. The skin incision can be sutured intermittently with silk thread or with intradermal sutures.

2.2.2. Conservative treatment group

The treatment plan involves a combination of antibiotics and symptomatic supportive care, as follows: Administer ceftriaxone sodium (2.0 g per dose, once daily) in combination with metronidazole (0.5 g per dose, twice daily) intravenously for anti-infection. Adjust the duration of medication based on the patient's condition, typically for 7 to 10 days. Simultaneously, provide symptomatic treatments such as fasting or a liquid diet, gastrointestinal decompression (if necessary), intravenous fluid replacement to correct electrolyte imbalances, and oral administration of ibuprofen sustained-release capsules (0.3 g per dose, twice daily) for fever and pain relief. During treatment, closely monitor the patient's body temperature, abdominal pain symptoms, and changes in blood routine indicators. If symptoms worsen, inflammatory markers continue to rise, or signs of complications appear, immediately switch to surgical treatment.

2.3. Observation indicators

(1) Treatment efficacy rate

Based on the patient's clinical manifestations, physical examinations, and laboratory test results, patients are categorized into three groups: cured, effective, and ineffective. Cured refers to the resolution of symptoms such as abdominal pain and high fever after treatment, with normalization of white blood cell count and neutrophil percentage, and retraction of the appendix observed on abdominal ultrasound. Effective indicates improvement in the aforementioned indicators after treatment, but not to the extent of full recovery. Ineffective refers to cases where there is no improvement or a worsening trend in the above indicators after treatment, necessitating alternative treatment approaches. The treatment efficacy rate is calculated as (number of cured cases + number of effective cases) / total number of cases × 100%.

(2) Symptom relief time

This includes the time to relief of abdominal pain (from the start of treatment until the abdominal pain symptoms have largely subsided) and the time to relief of fever (from the start of treatment until body temperature returns to normal and remains so for more than 24 hours).

(3) Complications

Record the occurrence of complications in both groups of patients, including incision infection and abdominal adhesion in the surgical group, and intra-abdominal abscess in the conservative treatment group.

2.4. Statistical methods

Data processing was conducted using SPSS 26.0 statistical software. Measurement data were expressed as ($\overline{x} \pm s$), and comparisons between groups were made using the *t*-test, with data rounded to two decimal places. Count data were expressed as [n (%)], and comparisons between groups were made using the χ^2 test. A *p*-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Comparison of treatment efficacy between the two groups of patients

The treatment efficacy in the surgical group was significantly higher than that in the conservative group ($p < 0.05$). Specific data are shown in **Table 1**.

Table 1. Comparison of treatment efficacy between the two groups of patients [n (%)]

Group	Cured	Effective	Ineffective	Treatment effective rate
Surgical (n = 30)	22 (73.33)	7 (23.34)	1 (3.33)	29 (96.67)
Conservative (n = 30)	15 (50.00)	8 (26.67)	7 (23.33)	23 (76.67)
χ^2-value				5.192
p-value				0.023

3.2. Comparison of symptom relief time between the two groups of patients

The relief times for abdominal pain and fever in the surgical group were significantly shorter than those in the conservative group (both $p < 0.001$). Specific data are shown in **Table 2**.

Table 2. Comparison of symptom relief time between the two groups of patients ($\overline{x} \pm s$, d)

Group	Abdominal pain relief time	Fever relief time
Surgical (n = 30)	1.25 ± 0.36	1.08 ± 0.29
Conservative (n = 30)	3.12 ± 0.57	2.89 ± 0.61
t-value	15.193	15.215
p-value	0.000	0.000

3.3. Comparison of complication incidence between the two groups of patients

In the surgical group, there were 2 cases of incision infection and 1 case of abdominal adhesion, with a complication rate of 10.00%. In the conservative group, there were 3 cases of abdominal abscess and 1 case of symptom aggravation, with a complication rate of 13.33%. The comparison of complication rates between the two groups showed ($\chi^2 = 0.162$, $p = 0.688$). All patients with complications recovered after symptomatic treatment.

4. Discussion

Acute appendicitis is a disease characterized by obstruction and secondary infection of the appendiceal tissue as its fundamental etiology, accompanied by corresponding pathological changes (including local congestion

and edema, accumulation of exudate, and adherence of fibrinopurulent exudate). When severe damage occurs to the appendiceal mucosa, it can lead to more severe infiltration of plasma cells in the submucosa, aggregation of neutrophils, and increased vascular permeability, resulting in fluid extravasation and ultimately gangrene of the appendiceal wall [6]. The sequence of "obstruction-infection-necrosis" forms an irreversible vicious cycle [7]. The primary objective of surgery is to remove the primary lesion, the diseased appendix, and thoroughly clear the surrounding inflammation, thereby halting disease progression and preventing a series of systemic and local complications caused by appendiceal perforation. This is also the fundamental reason for the favorable outcomes achieved with surgical treatment [8]. Conservative treatment, on the other hand, primarily targets bacterial inflammation caused by the proliferation of normal parasitic flora in the intestinal tract. Empirical treatment with antibiotics based on this can control disease progression but cannot resolve appendiceal lumen obstruction, which is the key factor contributing to its relatively lower treatment efficacy and the risk of recurrence [9].

The results of this study show that the effective treatment rate in the surgical group was 96.67%, significantly higher than the 76.67% in the conservative group. This data is highly consistent with the pathological mechanism of acute appendicitis. After surgical removal of the appendix, the focus is completely cleared, eliminating the basis for persistent inflammation. Consequently, the cure rate reaches as high as 73.33%, with only one case deemed ineffective due to postoperative incision infection. In contrast, 23.33% of patients in the conservative group experienced ineffective treatment, primarily because the obstruction of the appendiceal lumen was not relieved, allowing bacteria to continue proliferating and leading to prolonged inflammation. Some patients even experienced worsening inflammation and required conversion to surgical treatment.

In terms of symptom relief time, the surgical group exhibited significantly shorter durations for both abdominal pain and fever relief compared to the conservative group, highlighting the direct advantages of surgical treatment. After surgical removal of the focus, abdominal pain symptoms can quickly improve within 1–2 days postoperatively due to the elimination of the primary cause of the inflammatory response. The conservative group, on the other hand, relies on anti-infective drugs to gradually control pathogenic bacteria, resulting in slower dissipation of inflammatory markers and a more gradual recovery of corresponding symptoms. In this study, the average time for abdominal pain relief in the conservative group reached 3.12 days, while fever relief time was 2.89 days, showing significant differences compared to the surgical group. This provides data support for choosing surgical treatment for patients who require rapid symptom relief in clinical practice [10].

Regarding the incidence of complications, there was no significant difference between the two groups, a result that challenges the traditional belief that surgical treatment carries a higher risk of complications. The surgical group underwent appendectomy via abdominal incision and, through strict aseptic procedures during surgery, incision protection, and standardized postoperative anti-infective treatment, the incidence of incision infection was only 6.67%. Although the conservative group did not experience surgical trauma, due to inadequate and untimely control of inflammation, the incidence of abdominal abscess reached 10.00%. This suggests that both treatment options carry a certain risk of complications, and the key lies in standardizing the treatment process.

This study has certain limitations. First, this study is a single-center retrospective case series with a relatively small number of enrolled cases (a total of 60 cases), which may introduce selection bias. Second, no follow-up was conducted, the long-term recurrence rate in patients receiving conservative treatment was not statistically analyzed. Future research could involve multi-center prospective studies with larger sample sizes, incorporating long-term follow-up data and pathological classifications for more in-depth analysis.

5. Conclusion

In summary, surgical treatment for acute appendicitis is significantly superior to conservative treatment in terms of treatment efficacy and the speed of symptom relief, with no significant difference in the incidence of complications between the two treatment options. In clinical practice, for patients with acute appendicitis who have no surgical contraindications, abdominal incision appendectomy should be the preferred choice; for patients with surgical contraindications or those who strongly refuse surgery, conservative treatment can be adopted, but close monitoring of the patient's condition is necessary. Once signs of ineffective treatment or complications appear, immediate conversion to surgical treatment should be implemented.

Disclosure statement

The author declares no conflict of interest.

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