

Clinical Analysis of 123 Cases of Acute Colonic Diverticulitis

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Research article

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Abstract

Objective: To study the characteristics of acute colonic diverticulitis and the differences between different treatment options.

Methods: A retrospective analysis of 123 patients with acute colonic diverticulitis treated in our hospital from April 2013 to April 2020, including operation group (n = 30) and non-operation group (n = 93). The characteristics of acute colonic diverticulitis were analyzed, and the therapeutic effects of acute colonic diverticulitis were compared between the operation group and the non-operation group.

Results: 111 cases of Caecal and ascending colonic diverticulitis (proportion 90.2%, male to female ratio 2.26: 1, average age 39.6 ± 14.4 years, surgery ratio 24.3%, mean hospital stay 7.4 ± 4.3 days, recurrence rate 3.6%); 3 cases of transverse colonic diverticulitis; 3 cases of descending colonic diverticulitis; 6 cases of Sigmoid diverticulitis (proportion 4.9%, male: female 1: 1, average age 67.7 ± 4.5 years, surgery ratio 33.3%, mean hospital stay 11.7 ± 5.5 Days, recurrence rate 0%). 30 patients received surgical treatment, including 15 cases of abdominal drainage, 14 cases of colonic diverticulectomy and repair, and 1 case of sigmoidectomy. There was a statistically significant difference in the length of hospitalization between the operative group and the non-operative group ($P = 0.018$), and the length of hospitalization was longer in the operative group. There was no significant difference in the recurrence rate between the operative group and the non-operative group of colonic diverticulitis ($P = 0.595$). Colonic diverticulitis usually relapsed within 1 year. The total recurrence rate was 4.1%.

Conclusions: The right-sided colonic diverticulitis is more common in young and middle-aged. There is a higher incidence in males. The effect of non-operative treatment of acute diverticulitis is better than that of surgical treatment. Resection and repair of the diverticulum or abdominal drainage can be used in patients with acute uncomplicated diverticulitis.

1. Introduction

The colonic diverticulum is a benign lesion with local protrusion of the colonic wall, which can be single or multiple. It can occur in any position of the colon, but the characteristics of the disease vary greatly in different regions. Colonic diverticulitis is considered to be a rare clinical disease in China. The incidence of diverticulitis in Europe and the United States is significantly higher than that in China. In Europe and the United States, diverticulitis usually occurs in the left colon, especially in the sigmoid colon. In China, diverticulitis mainly occurs in the right colon, mainly in the cecum and ascending colon, and the proportion of sigmoid colon is low. In foreign studies, colonic diverticulitis often occurs in the middle-aged and elderly, but it may not be the same as that in China [1, 2].

2. Material And Methods

This article retrospectively analyzed 123 patients with acute colonic diverticulitis treated from 2013.4.1 to 2020.4.1 in Tongde Hospital of Zhejiang Province. The diagnosis was confirmed by abdominal

Computed tomography (CT), Colonoscopy, or surgical exploration. 30 cases were cured by operation and 93 cases were cured by conservative treatment. There are no failure cases in non-surgical treatment cases. In all cases, there were 85 male patients and 38 female patients (male: female 2.24: 1, average age 40.0 ± 15.4 years old). The study was approved by the Ethics Committee of Zhejiang Tongde Hospital.

Exclusion criteria: 1. The patient has not yet recovered, giving up treatment and requiring discharge; 2. The general data were missing and the follow-up information was lost after discharge.

2.1. Method of treatment

The operation group was treated by operation, including placement of drainage tube, resection, and repair of the diverticulum, colectomy. Antibiotics and fluid replacement were used after operation. The conservative group was treated with diet control, antibiotics, rehydration and other treatment measures.

Discharge criteria: 1. The signs of abdominal pain obviously relieved or disappeared; 2. There was no fever in nearly 48 hours, and the inflammatory indexes such as white blood cells (WBC) and C-reactive protein (CRP) were basically normal.

2.2. Data collection

The patient's age, gender, Hinchey's classification, diverticulum position, leukocyte index, and CRP index before admission, treatment method, length of stay and postoperative follow-up of colonic diverticulum were collected.

2.3. Statistics

SPSS17.0 statistical software was used for statistical processing. T-test was used for measurement data, chi-square test, or Fisher test was used for counting data. $P < 0.05$ was considered statistically significant.

3. Results

Location of diverticulitis: 111 cases of cecum and ascending colon (proportion 90.2%, male: female 2.26: 1, mean age 39.6 ± 14.4 years, surgery ratio 24.3%, leukocyte increase rate 64.9%, CRP increase rate 85.6%, 105 cases of Hinchey's grade I and 6 cases of Hinchey's grade II, average hospital stay 7.4 ± 4.3 days, the average follow-up time 33.5 ± 21.3 months, recurrence rate 3.6%); 3 cases of transverse colon (proportion 2.4%, male :female 2: 1, mean age 50.0 ± 16.7 years, surgery ratio 33.3%, leukocyte increase rate 66.6%, CRP increase rate 100%, 3 cases of Hinchey's grade I, average hospital stay 11.3 ± 4.0 days, average follow-up time 38.3 ± 10.2 months, recurrence rate 33.3%); 3 cases of descending colon (proportion 2.4%, 3 males, mean age 43.3 ± 11.0 years, operation rate 0%, leukocyte increase rate 100%, CRP increase rate 100%, 3 cases of Hinchey's grade I, average hospital stay 5.7 ± 0.6 days, average follow-up time 44.3 ± 28.6 months, recurrence rate 0%); 6 cases of sigmoid colon (proportion 4.9%, male :female 1: 1, mean age 67.7 ± 4.5 years, operation rate 33.3%, leukocyte increase rate 66.7%, CRP increase rate 66.7%, 4 cases of Hinchey's grade I and 2 cases of Hinchey's grade II, average hospital stay 11.7 ± 5.5

days, average follow-up time 30.5 ± 19.2 months, recurrence rate 0%). Colonic diverticulitis usually recurs within 1 year, and the total recurrence rate is 4.1%.

Surgical treatment was performed in 30 cases, including abdominal drainage in 15 cases, diverticulum resection and repair in 14 cases and sigmoidectomy in 1 case. There was a significant difference in the hospitalization time between the operation group and the non-operation group. There was a significant difference in the hospitalization time between the operation group and the non-operation group. The hospitalization time of the operation group was longer than that of the non-operation group. There was no significant difference in the recurrence rate between the operation group and the non-operation group (Table 1). There were no complications of intestinal leakage in both the operation group and the non-operation group.

Table 1
Comparison of colonic diverticulitis between operation group and non- operation group.

	Operation group(n = 30)	Non- operation group(n = 93)	t/ χ^2	P
Age(years)	38.6 ± 16.4	41.8 ± 15.0	-1.003	0.318
Gender			2.876	0.113
male	17	68		
female	13	25		
Location			-	1.000
right-sided colon	28	86		
left-sided colon	2	7		
WBC($10^9/L$)	11.0 ± 3.4	10.9 ± 3.8	0.099	0.921
CRP(mg/L)	55.4 ± 52.4	60.6 ± 53.8	-0.458	0.647
Hinchey's classification			-	0.000
grade I	23	93		
grade II	7	1		
Hospital stay(days)	10.2 ± 6.9	7.0 ± 3.2	2.494	0.018
Follow-up time(months)	42.3 ± 20.4	31.1 ± 20.6	2.606	0.010
Recurrence rate	6.7%	3.2%	-	0.595

4. Discussion

The etiology of the colonic diverticulum is currently unknown and generally has no clinical symptoms. In the United States, 4% of patients have clinical symptoms, and 15% of them have complicated disease [1].

In European and American countries, the incidence of acute left-sided colonic diverticulitis (ALCD) is higher, the right-sided colonic diverticulitis (ARCD) is relatively rare, and the ALCD is more common in the elderly [2]. Through a retrospective analysis of colonic diverticulitis in our hospital, ARCD is more common, and ALCD is rare. the proportion of males is higher. The onset age of ARCD is relatively young. This is consistent with some reports in China [3, 4].

Because the location of colonic diverticulitis varies greatly in different regions, there are also great differences in clinical manifestations and treatment plans. Caecal and ascending colonic diverticulitis are the most common in China, especially near ileocecum, which is similar to the clinical symptoms of acute appendicitis, including metastatic right lower abdominal pain, right lower abdominal fixed tenderness, and disease progression, etc [3]. Our hospital prefers non-surgical treatment for acute colonic diverticulitis, and the conservative effect is also commendable. There were no cases of surgical treatment due to conservative inefficacy. However, 24.3% of the cases underwent surgery, mainly because they could not be distinguished from acute appendicitis. All patients underwent a CT examination of the abdomen before surgery, and even experienced doctors may have misdiagnosis. When we carefully analyzed the abdominal CT before an operation, we found that it could be distinguished if we read carefully. However, Acute colonic diverticulitis is usually characterized by acute abdominal pain, so it is difficult to make a rapid diagnosis before an operation. Ultrasonography is recommended for ARCD according to 2020 WESE guidelines because these patients are young and CT poses radiation [2]. Combined with the characteristics of clinical cases in our hospital, the author thinks that CT has more advantages than ultrasound. The most common disease of acute abdominal pain is acute appendicitis in China. Once ultrasound is misdiagnosed as acute appendicitis, we may have an emergency operation. We know that most of them do not require surgical treatment, and abdominal CT can also exclude other diagnoses. However, we know that most diverticulitis does not require surgery. In addition, abdominal CT can also distinguish other diagnoses.

Compared with acute appendicitis, we have found that the clinical symptoms of ARCD were milder, and the symptoms can be relieved in a short time after treatment. Timely and effective treatment rarely leads to diffuse peritonitis or intestinal leakage, which inevitably makes surgeons mistakenly think that diverticulitis is mild. However, in a number of surgical exploration cases, we found that the diverticulum has supplicated and perforated. It has been partially wrapped by the greater omentum, so the clinical symptoms are mild. As mentioned earlier, the patient underwent emergency surgery because we were misdiagnosed as acute appendicitis without severe clinical symptoms. Therefore, we suspect that more patients with suppuration and perforation are in the conservative group. In this article, we found that preoperative CT is difficult to accurately assess whether the ARCD is perforated. There is a higher proportion of grade II in the operation group, but preoperative CT assessment is grade I. CT imaging evaluation is insufficient for Hinchey's classification of ARCD. After consulting the domestic literature in China, the author found that there were many cases of colonic diverticulum perforation, among which sigmoid colon was the most common [5, 6]. The reason may be related to the protection of the greater omentum. ARCD has been wrapped by the greater omentum before suppuration and perforation. The

sigmoid colon is not easily wrapped by the omentum, and the patients with sigmoid diverticulitis are generally older.

Colonic diverticulitis is often accompanied by increased inflammation indicators. Some patients with mild symptoms may have normal inflammation indexes. The sensitivity of CRP is relatively high, and the sensitivity of WBC is relatively low. If the inflammation index is not high, the patient can recover quickly without special treatment. MÄKELÄ et al. published a study that showed that CRP > 150 mg/L is an independent risk factor for colonic diverticulitis [7]. In our study, the proportion of patients with CRP > 150 mg/L was relatively less. Simultaneously, there was no significant increase in CRP in the early stage, which did not play an important reference role in treatment. However, CRP has important reference value for the treatment effect. CT imaging can effectively and quickly evaluate the severity of diverticulitis, and patients with limited inflammation usually recover better.

By comparing the operation group with the non-operation group, we found that there was no significant difference in the recurrence rate. But the length of stay in the non-operation group was significantly less than that in the operation group, and the cost of conservative treatment was also lower than that in the operation group. Therefore, we prefer conservative treatment, which is consistent with the results of foreign studies [1]. At present, the main surgical method is colectomy, but surgical trauma is relatively large [8, 9, 10]. There are no detailed guidelines for the treatment of ARCD. In China, colonic diverticulitis often occurs in the cecum and ascending colon. Right hemicolectomy may be required [11, 12]. Most of the cases in our hospital underwent resection and repair of the colonic diverticulum or abdominal drainage. There was no intestinal leakage after operations, and the postoperative recurrence rate was low. Colectomy is not recommended for uncomplicated diverticulitis. It is a question whether it is feasible to repair for acute complicated diverticulitis. We lack a large number of sample studies on the feasibility of diverticulectomy and repair of sigmoid diverticulitis. Only one case of uncomplicated sigmoid diverticulitis in our hospital underwent diverticulum resection, and there was no intestinal leakage after operations.

In this research, we found that colonic diverticulitis usually relapsed within 1 year, and the recurrence rate is low. Colonoscopy is not recommended during hospitalization, which may aggravate the condition. Colonoscopy is routinely recommended for 2–3 months after discharge, but some patients do not undergo colonoscopy. There is a high proportion of young people with diverticulitis in China, who often refuse colonoscopy.

5. Conclusions

In summary, ARCD is more common in young and middle-aged men. In China, ARCD is more common, and acute complicated diverticulitis is rare. The clinical symptoms of ARCD are very similar to acute appendicitis. It is easy to be misdiagnosed. Conservative treatment is effective, and drainage of abdominal abscesses or diverticulum resection and repair are also effective. We give priority to

conservative treatment. The inflammation index has reference value, but the value of abdominal CT is better.

Abbreviations

WBC.....white blood cells

CRP C-reactive protein

ARCD.....acute right-sided colonic diverticulitis

ALCD.....acute left-sided colonic diverticulitis

CTComputed tomography

Declarations

- Ethics approval and consent to participate

The study was approved by the Ethics Committee of Zhejiang Tongde Hospital.

- Consent for publication

Not applicable

- Availability of data and materials

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

- Competing interests

No competing interests

- Funding

Non-funding

- Authors' contributions

CZ: mainly collects data and writes articles

WD: analyze data and assist with writing articles

ZB: provides research content and analyzes the latest literature reports

JY: assists in collecting data and excluding in appropriate cases

All authors read and approved the final manuscript.

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- Authors' information (optional)

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