

## Surgery for Diverticular Disease of the Colon

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Surgery for complications of colonic diverticulum was evaluated on the basis of a result of clinical experience for the 15 patients.

1) Average age was 48.9 years, and right-side oriented lesions were more often seen in younger patients.

The men and women ratio was 1.5 to 1.0.

2) The reasons for surgery were disticulitis in 7 (46.7%), perforation in 3 (20.0%) and abscess and fistula formation in 2 (13.3%), respectively.

3) Complications on the left side were much more severe than those on the right side and also seen more often in older patients.

### Introduction

Diverticular diseases of the colon have been well known in Europe and the United States of America. Recently it has become recognized in Japan in accordance with improvement of dietary life and prevalence of barium enema examination. And also the incidence of this disease has been increase. Major clinical items are focused on the complications of this lesion such as diverticulitis, bleeding, abscess formation, perforation and fistula formation.

The aim of this study is to evaluate the validity of surgery for the diverticular disease of the colon on the basis of the result of clinical experiences at the First Department of Surgery, Nagasaki University School of Medicine.

### Patients

During the past 10 years from January 1982 to December 1992, 15 patients with complications of the diverticular disease of the colon underwent surgical treatment at the First Department of Surgery, Nagasaki University Hospital.

Table 1 shows patients' profile that needed surgery. The ages ranged from 22 to 69 with the average of 48.9 years. In 8 out of 15 patients, their age showed over 50 years. Men were predominant than women with a ratio of 9 to 6. According to the operative sites, surgery for the right-side

**Table 1.** Patients Profil

Ages	22~69 years (average 48.9)		
	over 50 years		8
male	9		
female	6		
location	right hemicolon		8
	left hemicolon		7
The number of lesions	simple	7	
	multiple	8	
The reasons for surgery	1) perforation		3
	2) abscess		2
	3) penetration		2
	4) stenosis		1
	5) diverticulitis		7

colon was seen in younger patients with the mean age of 39.1 years. In contrast, surgery for the left-side colon tended to be done in older patients with the mean age of 60.0 years.

Solitary diverticulum was seen in 7 and multiple diverticulosis were in 8. There was no significant difference in the location between the left- and right-half colons. In this series, surgery was indicated for diverticulitis in 7 (Fig. 1), peritonitis caused by perforation in 3, abscess formation and penetration to the other organ in 2, and stenosis by penetration in 1, respectively.

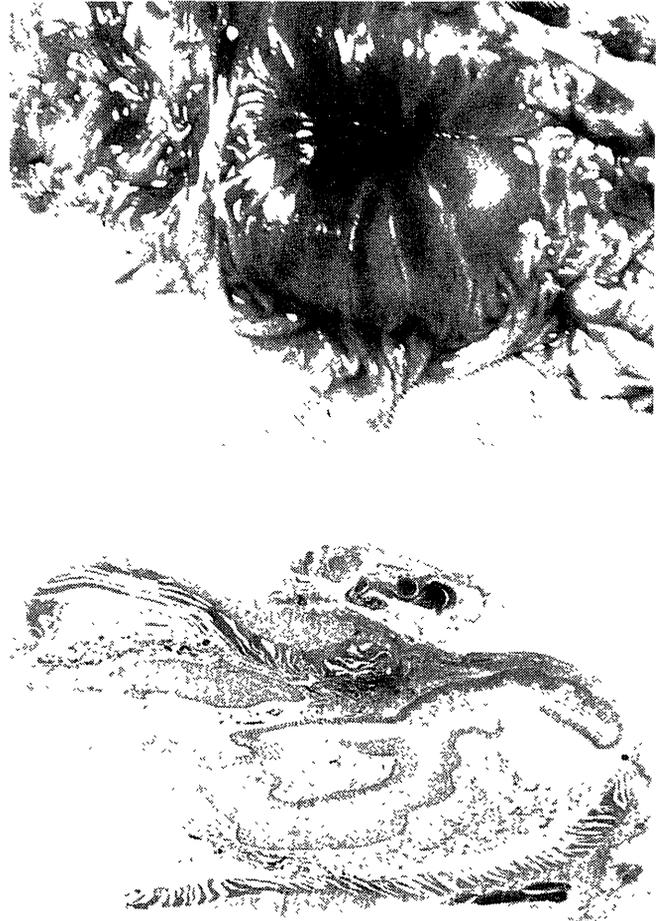
The perforated sites in patients with peritonitis caused by perforation from diverticulitis were the sigmoid colon in two and the ascending colon in one as shown in Fig. 2. All of the three cases revealed leucocytosis or solitary lesions. There was no significant complication in spite of resection of the perforated colon and anastomosis.

On the other hand, 2 patients with abscess formation had multiple diverticuli and palpable tumor masses with peritoneal signs as shown in Fig. 2. They were preoperatively diagnosed as acute appendicitis and/or perforation by diverticulitis.

There was no difficulty in preoperative diagnosis. In this series, we experienced two patients with perforation of diverticulum in the sigmoid colon to the other organs, the urinary bladder and the ileum.



**Fig. 1.** Barium enema revealed multiple diverticulosis of the sigmoid colon.



**Fig. 2.** Penetration to the ileum by diverticulum of the sigmoid colon.

Each patient complained of palpation of the tumor mass with stimulating syndrome of the urinary bladder and obstruction syndrome of the ileum. The time duration from onset to operation varied with variety and ranged from 2 weeks to 1 year.

All had multiple diverticulosis. Surgery for diverticulosis was indicated in patients with abdominal pain, diarrhea, bloody stool. Those in whom surgical treatment is indicated revealed an acute form of a 2 or 3 day and a chronic form of a 5 to 6 year duration. On the other hand, the leucocyte counts varied. The operative procedure of choice is a resection of the colon for multiple diverticulitis and a simple suture for single one.

## Discussion

The incidence of diverticulum is a range of 20 to 40%<sup>1, 2)</sup> in Europe and the United States of America. On the other hand, that in Japan is a range of 5.5 to 6.3%.<sup>3)</sup>

However, the incidence of diverticulum has become

increased with advancing age. Welch<sup>4)</sup> reported that there is seldom seen under 35 years of age. In contrast, the incidence of diverticulum has increased, 35% in the age group over 60 years, 40% over 70 years and 66% over 80 years of age, respectively.

Men are predominant in occurrence than women. The most favorite sites are said to be the sigmoid colon in Europe.<sup>5)</sup> On the other hand, in Japan, the predominant sites are the right side of the colon and there is a tendency toward affecting younger patients.<sup>6)</sup>

In this series, there was a similar tendency affecting younger patients on the right sides of the colon. Ulin reported that patients with diverticulitis are divided into two categories of acute and chronic diverticulitis and/or simple and complicated. Therefore, clinical manifestation is not uniform and its progression is variable. In general, a symptom of appendicitis is the initiation of this disease, accompanied by diarrhea, bleeding, and tenesmus.

The rule of the operation is to avoid performing emergency surgery under administration of antibiotics and nutritional cares. Echoguided drainage is required for this



**Fig. 3.** Abscess formation revealed by Ba-enema, simulating acute appendicitis of clinical signs.

purpose.

Perforation is one of the serious complications and more frequently occurs on the left side, less on the right. In this series, perforation occurred 2 on the left and 1 on the right, suggesting its occurrence on the right.<sup>8)</sup> Physicians should be aware that as a rule preceding diverticulitis causes idiopathic perforation by an increase in intraluminal pressure at defecation.<sup>9)</sup> Abscess formation is in a range of 4 to 28% in occurrence.<sup>10-11)</sup> Inflammation extends outside the muscularis mucosa of the colonic walls and it is often complicated with diverticulitis. Sometimes it progresses to fistula formation and inflammatory granulomas. They

sometimes require differentiation of carcinomas.

The mechanism of fistula formation is penetration into the surrounding tissues of diverticulum or abscess. Fistula is usually formed between the intestine, and the urinary bladder, the neighboring abdominal wall, the pelvic wall and the vagina.

A symptom of left side appendicitis is the most important sign of perforated diverticulum on the left side. And also repeated inflammation causes luminal stenosis by thickening and fibrosis of the muscular layer of colonic walls. Urgent surgery is needed for perforation and massive bleeding. However, emergency operation should be avoided as far as possible. And exteriorization, Hartmann'operation and temporary colostomy are selected for emergency operation to avoid postoperative complications.

The operative procedures of palliative incomplete resection and simple suturing are effective in preserving a bowed function for multiple diverticulitis. It was confirmed that recurrence was not experienced by palliative operation and simple suturing. In general a low incidence of as many as 3% is reported<sup>12)</sup> and palliative operation should be selected for multiple diverticulosis.

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