Are We Really Operating on Diverticulitis?

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The results of elective surgery for diverticulitis in 100 consecutive patients were reviewed. Follow-up was possible in 82 individuals. Seventy-seven (94 percent) were improved. There was no inflammatory change apparent on histologic examination of the resected specimens in 24 percent of patients. These individuals were less likely to have favorable results. There are a number of preoperative factors which may predict the likelihood of a successful surgical outcome. [Key words: Diverticulitis, colonic; Diverticulosis, colonic; Barium enema]

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DIVERTICULAR DISEASE OF THE COLON is a common disease of western civilization. Many papers address the problems of the indications for surgical intervention, the operative complications, and the mortality. What often is lacking in the literature is a consideration of the functional results. This retrospective study was undertaken 1) to determine if patients operated on electively for diverticulitis are relieved of symptoms, and 2) to identify the preoperative factors which might anticipate an optimal result following resection.

Material and Methods

The hospital and clinical records of all patients who underwent elective resection of the rectosigmoid for diverticular disease by the three senior surgeons (M.L.C., W.G.R., E.D.P.) during the years 1976 to 1983 were reviewed. Excluded were those individuals who required urgent or emergency surgery for obstruction or for perforation, those who were septic (peritonitis, pyrexia), and those who had not undergone complete bowel preparation. Elective resection for fistulous complications, however, was included for the purpose of this study. Patients were classified further on the basis of operative pathology: those with histologic evidence of acute or chronic diverticulitis, and those with diverticulosis alone (no inflammatory changes).

Patients were followed for a minimum of one year. Follow-up information was obtained by means of telephone communication or personal interview with respect to postoperative bowel habits and any additional episodes of abdominal pain since surgery. Patients were classified into three groups: Group 1, asymptomatic (normal bowel function); Group 2, minor complaints (occasional diarrhea, constipation, or infrequent episodes of mild abdominal pain); Group 3, major complaints (more severe bowel management problems and/or abdominal pain requiring treatment by a physician).

Results

One hundred consecutive patients were studied, 63 women and 37 men. The age range was 32 to 82 years (mean, 61 years). Fourteen patients (14 percent) were younger than 50 years old. All underwent primary resection and anastomosis, but five patients also had a temporary diverting loop colostomy.

There were no operative deaths. Seven died in the interim of unrelated causes; 11 others were lost to follow-up. Eighty-two patients were available for evaluation (53 women and 29 men). Follow-up ranged from 12 to 104 months (mean, 37 months). Sixteen complications were observed in 14 patients (Table 1). Histologic evidence of diverticulitis was identified in the specimens of 62 patients (76 percent). Thirty-three demonstrated changes consistent with acute diverticulitis and the other 29, chronic diverticulitis. The resected colons from the remaining 20 patients showed no evidence of inflammatory change.

Follow-up evaluation revealed that 94 percent of the patients were improved (asymptomatic or minor complaints). Five patients (6 percent) had major complaints (Table 2). All in the latter group complained of both recurrent abdominal pain and difficulty in bowel management.

Analysis of clinical results was made by comparing the group with histologic evidence of inflammatory change against the group that showed no inflammation (Table

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TABLE 1. *Complications of Elective Resection*

Complications	Number of Patients
Early	
Pseudomembranous enterocolitis	2
Evisceration	1
Myocardial infarction	1
Late	
Ventral hernia	10
Small-bowel obstruction	1
Wound infection	1

TABLE 2. *Results of Resection for Diverticular Disease*

Result	Number	Percent
Asymptomatic	60	73
Minor complaints	17	21
Major complaints	5	6
TOTAL	82	100

3). Patients with acute or chronic diverticulitis had fewer complaints following surgery ($P = 0.002$).

Fifty of the 82 patients reported an alteration in bowel habits preoperatively. All patients with bowel complaints of less than one year's duration were improved following resection; 90 percent were asymptomatic. However, only one half of the 30 patients who had experienced bowel irregularity for more than a year was asymptomatic after surgery. Ten had minor complaints, and five had major complaints (Table 4). Two patients did not have specific bowel problems preoperatively. Patients with a shorter duration of preoperative bowel complaints had a significantly better result statistically following surgery than those individuals with complaints in excess of one year ($P = 0.002$).

Localization of the abdominal pain preoperatively was analyzed with respect to results following resection. Twenty-four patients (29 percent) reported pain *not* localized to the left lower quadrant. Four (17 percent) had major complaints at follow-up. Only one patient had a major complaint when the preoperative pain was so localized ($P = 0.005$).

Men were found to have better functional results. All were improved after resection, 90 percent of whom were asymptomatic. Only 34 women (64 percent) were asymptomatic. The apparent difference in results between the sexes, however, likely is due to the fact that 90 percent of the men were found to have inflammation (diverticulitis) in the pathologic specimen, whereas only 68 percent of specimens from women exhibited such changes.

Thirty-one patients had barium-enema findings consistent with diverticulitis. Abnormalities included sinus formation, fistula tract, an extrinsic mass, or persistent narrowing. All of these patients were improved following resection; 27 (87 percent) were asymptomatic.

TABLE 3. *Results of Resection for Diverticular Disease (Operative Pathology)*

Result	Number (Percent)	
	Diverticultis	Diverticulosis
Asymptomatic	52 (84)	8 (40)
Minor complaints	9 (14)	8 (40)
Major complaints	1 (1)	4 (20)

TABLE 4. *Results of Resection for Diverticular Disease (Duration of Preoperative Bowel Complaints)*

Result	Number (Percent)	
	< 1 Year	> 1 Year
Asymptomatic	18 (90)	15 (50)
Minor complaints	2 (10)	10 (33)
Major complaints	—	5 (17)

Discussion

The decision of whether to operate on patients with symptoms suggestive of diverticulitis may be difficult when objective radiologic or clinical evidence of inflammation is lacking. Particular concern arises with respect to anticipated alleviation of pain when there is no pathologic confirmation. Patients with inflammatory changes in the resected specimen are more likely to be clinically improved than those patients whose colons demonstrated only diverticulosis. However, failure to identify inflammation does not preclude the possibility of a successful result following surgery. Morson reported no sign of inflammation in one third of examined colons from patients who had undergone resection for "diverticulitis."[1] Our study demonstrates this also; diverticulosis was found only in 24 percent.

Others also have reported the lack of correlation between the clinical features and the pathologic findings of patients with diverticular disease. Parks noted that it is not uncommon for patients to have abdominal pain and tenderness as well as bowel movement irregularity from muscle dysfunction without any evidence of inflammation.[2] He and Connell observed a reduced threshold for the development of pain and the urge to defecate in response to stretching of the sigmoid in patients with diverticular disease when compared with normal subjects.[3] Sigmoid diverticular disease is, after all, produced by a disorder of muscle function.[4] Painter proposed that diverticulosis without inflammation causes symptoms, and that some patients require surgery to relieve pain in the left lower quadrant.[5] He postulates that this pain may be caused by a lower threshold for discomfort and also by a functional obstruction from segmentation of the colon.

Two preoperative factors in our study that were associated with more frequent postoperative complaints were the presence of bowel management problems for more

than one year, and abdominal pain not localized to the left lower quadrant. Diverticular disease of the colon and irritable bowel syndrome are two of the most common gastrointestinal illnesses. It is not surprising, therefore, that their clinical features often overlap. In a study of 88 patients with irritable bowel syndrome, Havia and Manner found that 24 percent developed colonic diverticula.[6] Ritchie found that a high proportion of patients with irritable bowel syndrome had a lower threshold of pain when the colon was distended with a balloon, similar to that observed in patients who have diverticular disease.[7] With respect to the apparent sex difference in results of surgery, men are less likely to have functional bowel complaints; hence, misinterpretation of symptoms is an unlikely event, and their correlation with radiologic and clinical findings usually is self-evident.

Although barium-enema examination was found to be useful in decision making, radiologist and surgeon variability in interpretation of the films must be considered. In a study by Parks *et al.*,[8] two radiologists were asked to review the barium-enema films from 40 patients with diverticular disease and to divide them into categories of either diverticulosis or diverticulitis. The two disagreed in 15 patients (38 percent). Furthermore, if the original radiologist's report were included, the three disagreed in 25 instances (62 percent). In 12 cases in which at least one radiologist believed that diverticulitis was present, the pathologist found no evidence of inflammation. In three of the 31 barium enemas in the present study which were consistent with diverticulitis (10 percent), no inflammation was found in the operative specimen. However, these three patients were improved after resection, as were all patients in our study who had radiologic evidence of inflammation.

Conclusion

The overwhelming majority of patients who have proper surgical indications are improved by elective resection for diverticular disease. Ninety-four percent of patients in this study had amelioration of their symptoms, while five patients (6 percent) still had major complaints. Identifiable preoperative factors contributed to an expected favorable result. These included male sex, preoperative bowel complaints of less than one year, abdominal pain localized to the left lower quadrant, and radiologic evidence of diverticulitis. Patients in whom these factors are absent also benefit from surgical intervention, but not with the frequency of success anticipated in the former group.

Are we operating on diverticulitis? Since 94 percent of patients are improved, one must assume the answer to be affirmative.

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Announcement

XI BIENNIAL CONGRESS OF THE INTERNATIONAL SOCIETY OF UNIVERSITY COLON AND RECTAL SURGEONS

The XI Biennial Congress of the International Society of University Colon and Rectal Surgeons will be held May 4-8, 1986, in Dallas, Texas. Dr. H. Gray Carter is Chairman of the Program Committee. Address: 3600 Gaston Avenue, 707 Barnett Tower, Dallas, Texas 75246. Telephone: (214) 827-0953.