Elective Surgical Treatment of Diverticulitis

Brett T. Gemlo, M.D.¹

ABSTRACT

Elective surgical resection in cases of diverticulitis should be offered to patients who have experienced two episodes. High-risk patients such as immunocompromised individuals or transplant patients may warrant resection after one episode. It is controversial whether young patients or patients with right-sided diverticulitis need to be treated differently. Chronic diverticulitis can be successfully treated surgically in selected cases. Adequate surgical resection margins should include the top of the true rectum and the proximal extent of thickened inflamed colon to minimize the risk of recurrence. Careful operative planning and the use of proximal diversion if unsuspected significant inflammatory changes are encountered will improve surgical outcomes.

KEYWORDS: Diverticular disease, elective surgery, right-sided diverticulitis, patient selection, temporary diversion

Objectives: Upon completion of this article, the reader should be able to describe the elective surgical management of diverticular disease.

Elective surgery of diverticulitis remains a challenging clinical problem despite major advances in the medical therapy of diverticulitis, radiographic procedures, and more aggressive treatment of acute diverticulitis. Selection criteria, extent of resection, use of diversion, and surgical approach must be individualized based on patient and technical criteria. This article will present concerns surrounding open transabdominal surgery; the role of a laparoscopic approach is addressed elsewhere in this issue.

PATIENT SELECTION

The identification of which patients with a history of acute diverticulitis will benefit from an elective colonic resection is complex and subject to multiple variables. After the successful medical treatment of an uncomplicated episode of acute diverticulitis, the presumed goal of

elective intervention is the avoidance of further, possibly more serious, episodes. Studies of the natural history of diverticulitis suggest that the likelihood of readmission after medical treatment of a first episode is only 25%, while the medical response rate for a third attack was only 9%.¹ Patients with recurring episodes of diverticulitis have a 60% risk of further complications, thus leading to the recommendation for elective resection after two episodes of acute diverticulitis.² This recommendation is generally supported by most authors and is contained in the Practice Parameters for the Treatment of Sigmoid Diverticulitis promulgated by the American Society of Colon and Rectal Surgeons.³⁻⁵ An interesting cost-effectiveness analysis concluded that surgical treatment of uncomplicated diverticulitis was most cost-effective after the *third* episode, and that this policy did not result in a decrement in quality of life or shortening of life expectancy.⁶ This study used estimates of

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the probability of clinical events and did not consider patients less than 55 years of age, but it may influence how we approach diverticular disease in the future. Somasekar and colleagues contend that since only 2.7% of their patients presenting with complicated diverticulitis had a previous episode of acute diverticulitis, elective colectomy does little to reduce the risk of serious complication, and they felt further identification of risk factors was needed prior to endorsing a policy of elective interval colectomy.⁷ Nevertheless, consensus opinion still supports the recommendation of elective sigmoid colectomy after two episodes of diverticulitis.

The definition of an "episode" has traditionally been acute diverticulitis necessitating admission to the hospital for intravenous antibiotics and bowel rest. The introduction of potent oral antibiotics, which can successfully treat infections that used to require hospitalization, may have changed this recommendation. The reflexive use of these antibiotics by primary care physicians for episodes of left lower quadrant pain without radiographic or endoscopic confirmation of pericolic inflammation may simply be treating conditions like irritable bowel syndrome. The decision to proceed with elective resection must be based on the nature and documentation of the previous episodes and how they were treated.

Other causes of colonic inflammation like inflammatory bowel disease and ischemic colitis must be ruled out with colonoscopic evaluation prior to surgical intervention. This should not be done at the time of diagnosis of the first attack of diverticulitis. After initial treatment, an interval of 4 to 6 weeks to permit the resolution of inflammatory changes should be allowed prior to endoscopic evaluation. Further episodes do not need follow-up colonoscopy.

Studies of the natural history of diverticular disease and medical response rates have led to the recommendation of elective resection after two episodes. There are, however, subsets of patients for whom this standard may not apply. Immunocompromised individuals like transplant patients or patients with chronic renal failure or AIDS have a higher incidence of serious complications and should be treated with elective surgery after one episode if medical treatment is successful.⁸⁻¹² Patients who develop complications of diverticulitis like abscess, fistula, or stricture are generally operated on after the inflammation subsides if the patient is an appropriate surgical candidate.¹³ Not all patients who have undergone percutaneous drainage of a pericolic abscess need elective resection if the cavity resolves completely, though this remains controversial as the data are scarce.^{14,15}

Younger patients with diverticulitis may represent a subset that requires a different threshold for resection. Some authors have suggested that the course of acute diverticulitis in patients less than 50 was more severe,

required more frequent surgical intervention, and was more prone to recurrence and complication after conservative treatment.^{5,16-20} These investigators therefore recommend elective resection after a single episode of acute diverticulitis in young patients. No etiologic mechanism could be hypothesized. Others are unable to substantiate a more malignant course in those patients and contend that higher operative intervention rates may be due to a low index of suspicion and misdiagnosis in this younger age group.²¹⁻²⁵ A different approach to younger patients may not be justified, but being younger and healthier, with fewer comorbidities to increase surgical risk and with a longer life expectancy may on their own tip the balance in favor of earlier intervention.

Left-sided diverticulitis is the most common manifestation of diverticular disease in the United States, but this is not the case in much of the world. Right-sided diverticulitis is much more common in Asian populations, and its management may be quite different. Some reports have suggested that right-sided diverticulitis is a more aggressive disease and may require earlier surgical intervention as only 40% of patients were treated successfully medically.^{26,27} This impression may in part be due to the fact that right-sided symptoms often lead to the misdiagnosis of appendicitis, inflammatory bowel disease, or pelvic inflammatory disease. This may either delay the diagnosis or prompt early exploration and difficulty in ascertaining the correct diagnosis in the face of acute inflammation. A more recent study argues that medical therapy may be more effective for right-sided disease than for left-sided diverticulitis. It recommends continued conservative management, even for a third episode.²⁸

CHRONIC DIVERTICULAR DISEASE

One of the most vexing forms of diverticular disease to treat is chronic diverticulitis, where there is no evidence of an inflammatory process, but the patient experiences persistent and often disabling pain. Many physicians doubt the existence of such a syndrome, but there does seem to be a subset of patients with chronic pain in whom irritable bowel syndrome, ischemic colitis, endometriosis, and inflammatory bowel disease can be ruled out. Some of these patients will demonstrate endoscopic evidence of diverticular-associated colitis, which may be associated with a higher likelihood of subsequent segmental resection.^{29,30} After documentation of colonic diverticula and exclusion of other pathology, an elective sigmoid resection can be offered selected patients with reasonable expectations of a good outcome. Horgan and colleagues found that postoperatively 88% of their patients were rendered pain-free, and 76% of patients noted complete symptom resolution.³¹ Thorn and associates reported good or excellent functional results in two thirds of patients operated on for chronic

diverticular disease.³² Careful patient selection is crucial, but there does seem to be a role for the surgical treatment of this challenging problem.

EXTENT OF RESECTION

Proper conduct of an elective resection for diverticular disease includes the removal of the diseased segment of bowel, which is not synonymous with resection of all diverticula-bearing bowel. The margins of resection of the thickened, scarred portion of bowel are usually obvious upon entering the abdomen, but the amount of normal-appearing proximal or distal bowel to be taken in continuity as part of the specimen is debatable.

The distal margin is quite important in minimizing the risk of recurrent diverticulitis. Benn and colleagues found that the risk of recurrent diverticulitis nearly doubled (12.5% versus 6.7%) if the distal resection margin included taenia coli indicating that sigmoid colon rather than true rectum was used in the anastomosis.³³ Thaler and colleagues reported a significantly higher percentage of patients with taenia coli present at the distal resection margins in patients with recurrent diverticulitis as compared with patients with no recurrence.³⁴ Especially in cases of emergent resection of perforated diverticulitis where the extent of distal resection may be overshadowed by the desire to expeditiously remove the infected phlegmon and create a Hartmann's pouch, careful resection of any remaining distal sigmoid colon at the time of colostomy takedown should be accomplished prior to anastomosis. This can be technically challenging, especially in cases where extensive peritonitis was present at the first procedure. Ureteral stents to help identify the ureters makes this process much easier and should be considered in all Hartmann's reversals.

Criteria for the extent of proximal resection are less clear-cut. Many patients with symptomatic diverticulitis will have additional involvement in their colon proximal to the area of inflammation. Removal of these asymptomatic segments is hard to justify given the low chance of recurrent disease and the concomitant alteration of bowel function that result from more aggressive resection. Mobilization of the splenic flexure and use of descending colon rather than sigmoid may facilitate anastomosis by decreasing the number of diverticula at the bowel edge. Progression of diverticular disease is uncommon and probably does not contribute to recurrent episodes.⁴ Diverticulitis is not coincident with diverticulosis and surgical therapy should be directed at the inflammatory process, not the benign disease.

OPERATIVE APPROACH

Elective exploration and resection of diverticular disease should be judicious and well timed. Full bowel prepara-

tion, lithotomy positioning, and the liberal use of ureteral stents is recommended. Despite this, unsuspected sepsis is occasionally encountered, and after resection a decision must be made about restoring continuity or diversion. The use of an end colostomy and Hartmann's pouch has been the historical standard, but concerns of morbidity and "permanence" of the temporary stomas have tempered the enthusiasm for this procedure.^{35,36} There is growing evidence to support the safety of primary anastomosis, often in concert with either on-table lavage or temporary stoma.³⁷⁻³⁹ A stapled colorectal anastomosis of healthy colon to the top of the true rectum may still require protection if in the surgeon's judgment there is significant local inflammatory change. Proximal temporary diversion with a temporary loop ileostomy may be the best approach.⁴⁰ Our series at the University of Minnesota of 230 patients undergoing surgical intervention for diverticular disease included 27 Hartmann's procedure and 17 primary anastomoses with proximal ileostomy diversion. All patients with diverting ileostomies underwent eventual takedown, while several temporary colostomies became permanent. Length of stay for stoma takedown was over twice as long for Hartmann's reversals (13 days) as compared with ileostomy takedown (5.3 days). Primary anastomosis with proximal diversion may represent a superior alternative to Hartmann's procedure when primary anastomosis alone is deemed unsuitable.^{39,41}

The keys to the successful elective treatment of diverticulitis are proper patient selection, recognition of the spectrum of disease, identification of high-risk subgroups of patients, and careful operative planning. Recognition of the anatomic basis of an adequate resection and judicious use of diversion will minimize morbidity and mortality and optimize outcomes and patient quality of life.

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