

An overview of diverticulitis surgical treatment

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Abstract:

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. The aim of this review article is to analyze the types, discuss proper surgery for uncomplicated and complicated diverticulitis, to indicate alternative surgical methods for it.

Comprehensive searching strategy through Well-known medical databases (MIDLINE/ PubMed, and Embase) searching articles that published in English

language up to December 2017, and discussing the diverticulitis surgical treatment,

Mesh Terms used in search method as following; “diverticulitis”, “management”,

“surgical intervention”. Diverticulosis is an illness of modern man, one that remains to trigger

significant morbidity and mortality. The large majority of diverticulitis is treatable without surgery. Surgery needs to be provided moderately and just for those patients that have recurrent attacks of real, documented diverticulitis, who have a serious complication of the illness, or that remain in a special category, such as the immunocompromised. The indicators for elective

surgery for uncomplicated diverticulitis need to otherwise be modified for each individual patient. In contrast, most clinicians concur that sigmoidectomy is warranted for complicated diverticular disease. Laparoscopic sigmoidectomy is now approved as an advantageous alternative to open surgery in select patients. Laparoscopic lavage might be an alternative for generalised, non-feculent peritonitis.

Introduction:

Colonic diverticulosis is extremely usual in Western countries. Prevalence increases with age, and is estimated to influence roughly 70% of people by age 80 [1]. Manifestations of diverticular disease, that include diverticulitis, blood loss, abscess, free perforation, fistula, and stricture development account for considerable illness problem and are regularly related to bad outcomes, consisting of death [2]. Moreover, hospitalizations for acute diverticulitis are increasing, leading to escalating costs in the US, now estimated to exceed 2.4 billion dollars annually [3].

Our progressing understanding of the pathophysiology and nature of the disease, in addition to improvements in analysis imaging and nonsurgical management of the illness have caused considerable changes in treatment referrals [4]. Less hostile medical and surgical therapies have been suggested. In cases of acute uncomplicated diverticulitis, outpatient management has been advocated for, and the use of antibiotics tested [5]. Likewise, in cases of complex diverticulitis, nonsurgical management is favored at first, including percutaneous drainage of abscesses, given the high morbidity and death of urgent procedures [6]. Upkeep of intestinal tract continuity via

primary anastomosis and making use of minimally intrusive techniques are promoted for in elective and immediate settings.

Existing method guidelines are customized to the individual patient, taking into consideration danger factors, disease intensity on initial presentation, relentless symptoms, and patient preferences [4]. Technical elements of the various surgical treatments are entrusted to the discretion of the individual specialist.

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. The aim of this review article is to analyze the types, discuss proper surgery for uncomplicated and complicated diverticulitis, to indicate alternative surgical methods for it.

Methodology:

Comprehensive searching strategy through Well-known medical databases (MEDLINE/ PubMed, and Embase) searching articles that published in English language up to December 2017, and discussing the diverticulitis surgical treatment, Mesh Terms used in search method as following; “diverticulitis”, “management”, “surgical intervention”. Furthermore, references list of each article were searched for more eligible papers for present review.

Discussion:

- **Uncomplicated diverticulitis**

Patients with uncomplicated diverticulitis normally have an indolent training course with a low incidence of subsequent complications [7], [9].The majority of patients efficiently react to outpatient management [5], [10].Inpatient therapy with bowel remainder and IV antibiotics is advised for those with consistent abdominal discomfort that does not enhance with outpatient antibiotic therapy. Recently, making use of antibiotics in mild episodes of the condition has been questioned. A randomized controlled test from Europe discovered no distinction in reoccurrence or development of difficulties after one year in those treated with antibiotics, versus those that did not obtain them [8] Clinical judgment remains an important aspect of managing acute diverticulitis and identifying resolution of acute inflammation.

Reoccurrence of acute diverticulitis is lower than formerly assumed. It is regularly reported that about one third of all patients with acute diverticulitis will certainly have a persistent strike, frequently within one year [4], [11] Reoccurrence after an uncomplicated episode of diverticulitis, nevertheless, has just recently been revealed to be much reduced, with one prospective study reporting a reappearance of just 1.7% over 5 years of follow up [9].Significantly, a complicated reappearance after recovery from an uncomplicated episode is extremely uncommon, a finding showed in several studies [11].

Elective surgery for uncomplicated diverticulitis

The guidelines for elective sigmoid colectomy for uncomplicated diverticulitis have changed [4].The choice to proceed with elective resection ought to not be based upon the number of episodes or age at start, and routine "prophylactic" optional colectomy is not advised after an acute episode [12].Researches have revealed that a raising variety of episodes of acute uncomplicated diverticulitis do not raise the danger of reoccurrence, complications, or the need

for urgent operative management [12]. Additionally, the greatest risk of free perforation is throughout the very first episode of illness [13]. Younger patients (age of beginning <50 years) do not have a more aggressive training course, as formerly assumed [14]. As a matter of fact, a reduced limit for both optional and urgent resection has been advised in immunocompromised patients, provided the linked raised risk for failing of medical management and enhanced threat of recurring illness with significant morbidity [15].

Despite the restricted indicators for elective surgery for acute diverticulitis, multiple population-based researches have revealed a large increase in the variety of elective colectomies performed in the United States [16]. This boost is most dramatic in younger patients, aged 18-44 years. This data may recommend a delay in fostering of the technique guidelines and/or could reflect the enhancing incidence of acute diverticulitis.

- **Complicated diverticulitis**

Complicated diverticulitis encompasses a broad range of disease presentation, varying from small pericolic abscesses to perforation with generalised peritonitis and blood poisoning, along with late difficulties, consisting of fistula and stricture development. Therapy of difficult diverticulitis in the acute setting depends on the patient's overall professional condition and degree of peritoneal contamination and infection. The most commonly made use of grading system to define the severity of complicated diverticulitis is the Hinchey category (Table 1) [17].

Table1. Hinchey classification [17].

Hinchey classification	Description
I	Colonic inflammation +pericolic abscess or phlegmon (confined)
II	Colonic inflammation + retroperitoneal or pelvic abscess
III	Colonic inflammation +purulent peritonitis
IV	Colonic inflammation +fecal peritonitis

It has been estimated that regarding 15-20% of all patients admitted with acute diverticulitis, both complicated and uncomplicated, will certainly require surgical intervention during their preliminary admission [18]. Those with complicated diverticulitis are much more most likely to require a procedure during their preliminary hospitalization, upwards of 50% of the time [19]. Offered the significant morbidity related to immediate colectomy for complicated diverticulitis, nonetheless, there is a fad to prefer non-operative management initially. The proportion of patients undergoing urgent colectomies has lowered in recent years, from 71 to 55% [19].

Hinchey I-II

One of the most typical discussion of complicated diverticulitis is an abscess, approximated to take place in roughly 15% of patients [4]. For small abscesses < 2 cm, medical management (bowel rest and IV antibiotics) is often sufficient. For larger abscesses > 2 cm, medical management (bowel remainder and IV prescription antibiotics) is commonly sufficient. For bigger abscesses > 5 centimeters, image-guided percutaneous drain is the favored preliminary treatment [4]. Inning accordance with recent researches, there has been a regular rise in patients confessed with diverticular abscesses, in addition to an increase in those undergoing percutaneous drain positioning [18].

Hinchey III-IV

The occurrence of free perforation (purulent and feculent peritonitis) shows up to have stayed stable in the last few years at about 1.5% [19]. Patients that provide with sepsis and scattered peritonitis need immediate personnel treatment [4]. Two solitary institution studies, nevertheless,

have recently recommended nonoperative management for pick patients in the lack of serious blood poisoning.

When treated nonoperatively, complicated diverticulitis is connected with high reoccurrence rates, reported approximately 50%. When as compared to those with uncomplicated diverticulitis greater occurrences of late complications consisting of consistent symptoms, abscess, fistula and stricture have been reported. In several researches, the severity of the preliminary illness presentation, based on CT findings, is straight associated to an increased threat of reappearance and succeeding difficulties [20]. To further assess this relationship, Ambrosetti et alia created a CT-based severity grade and correlated this retrospectively with patient results, clarifying the value of imaging as a prognostic indicator to guide management [20]. A "serious grade" on CT, which included proof of abscess, extraluminal air, or extraluminal comparison was statistically predictive of clinical treatment failure in the acute stage, and for enhanced danger of reappearance or additional difficulties after effective nonoperative management [20].

Location and size of the abscess on discussion likewise contributed to the threat of reappearance and failing of nonoperative therapy [11]. In a prospective research of 73 patients with diverticular abscesses, pelvic abscesses were associated with even worse end results when compared to mesocolic abscesses. In a retrospective study of 218 patients undergoing percutaneous drain, a larger abscess, defined as dimension more than 5 centimeters, was additionally dramatically connected with higher reoccurrence rates [21].

Debate exists regarding whether or not elective colon resection after successful nonoperative management of complicated diverticulitis is necessary. This idea is sustained by the reality that monitoring after percutaneous drainage appears to be secure in picked patients [21].

Inning accordance with the American Society of Colon and Rectal Surgeons (ASCRS) technique specifications, optional colon resection should normally be recommended after a complicated episode is originally treated nonoperatively, due to the high occurrence of clinical treatment failing, reappearance, and late issues [4]. On top of that, patients with fistula formation or stricturing disease are suggested for resection.

- **Technical aspects of surgical management**

Primary anastomosis versus Hartmann procedure (HP)

Alternatives for definitive surgical procedure entail resection of the impacted colon with or without anastomosis. The two-stage method, generally called HP, refers to sigmoid colectomy with end colostomy and later on colostomy turnaround. HP became the guideline for perforated diverticulitis in the 1980s [22]. It is connected with a high morbidity and death, as well as a high rate of non-reversed colostomies, reported approximately 55% [6]. Surgical management, as a result, has evolved far from HP to developing digestive tract continuity, by means of sigmoid colectomy and primary anastomosis (PA), with or without protective drawing away loop ileostomy (DLI). This is often built in the visibility of abscess or totally free perforation.

The medical resection margin ought to extend proximally to compliant bowel (does not have to be without diverticula) and distally to the upper rectum (where the taeniae coli coalesce). An appropriate distal margin is the most important factor in establishing recurrence after resection [4]. Reappearance danger with colocolonic anastomosis is up to four times higher than that of intestines anastomosis [23]. Some have promoted for regular splenic flexure mobilization to assist in tension-free anastomosis. We believe, nonetheless, the need for this is identified intra-operatively, based upon the patient body-habitus and length of colon resected.

The vast majority of optional resections, roughly 95%, are carried out with PA. Although traditionally, HP has been the treatment of option in the urgent setting, retrospective studies contrasting HP to PA with or without DLI have revealed comparable temporary outcomes (consisting of mortality and postoperative infections) [24] An organized review wrapped up that the overall morbidity and mortality were higher for HP compared to for PA, suggesting that PA with or without proximal DLI is safe in patients with diverticular peritonitis [6]. Patient choice stays a crucial element. In the majority of these research studies, the patients selected for PA were younger, with reduced Hinchey ratings [24]. In a trial by Oberkofler et al, which randomized 62 patients to PA with DLI versus HP located similar mortality and difficulty rates, only 58% of the patients that went through HP, however, had future reversal of their stoma. In addition, colostomy use has been connected with higher comorbidities [3]. Concordant with suggestions from the literary works, current information has revealed that making use of primary anastomosis in the acute setting is increasing.

The present body of proof suggests that primary anastomosis can and need to be performed in patients with acute complicated diverticulitis, conditions allowing. Eventually, this choice is left to the judgment of the specialist, taking into consideration the clinical standing of the patient including comorbidities, health of the remaining intestine, and extent of peritoneal contamination.

Approach to colon resection: laparoscopic versus open

Elective setting: The laparoscopic method has been revealed to have several advantages over open surgical treatment, consisting of lower mortality and postoperative difficulty rates, shorter health center remains, and lower total expense [25]. In the Sigma trial, which randomized 100 patients to laparoscopic vs open colectomy in the optional setup, the laparoscopic team had less

major difficulties, though in long-term subsequent, there were no distinctions between the two teams [26]. Two added small-randomized tests cannot reveal a significant distinction in outcomes, yet these researches were underpowered and had difficulty with enrollment due to patients' choice for laparoscopic surgery [27].

Overall, the variety of laparoscopic colectomies performed for diverticular illness has been enhancing, but remains less than prepared for, with less than half of colectomies for diverticulitis being attempted laparoscopically [25].

Urgent setting: The function of laparoscopy in the urgent setting is incompletely evaluated. In a small retrospective study, emerging laparoscopic surgery for patients with complicated diverticular illness was associated with reduced morbidity and a much shorter length of keep, when as compared to open procedures [28].

A laparoscopic HP has been suggested as a method to decrease the postoperative complications and expedite healing. This has not been shown, nonetheless, to reduce postoperative morbidity and mortality after controlling for amazing variables and is consequently not presently recommended [29]. Overall, laparoscopic method for 1 or 2 phase procedures is infrequently executed in the urgent setting and is reported in only 3.4-6% of all treatments.

Laparoscopic lavage

Current agreement holds that there is insufficient evidence to advise laparoscopic lavage as an alternative to resection [4]. Laparoscopic lavage has been suggested as an alternate management method in patients with peritonitis in order to manage contamination and bridge these patients to optional resection with primary anastomosis at a later date [30]. Small observational researches have shown less complications in patients with diverticulitis going through laparoscopic lavage

versus primary resection. The patients chosen for laparoscopic lavage were healthier with lower Hinchey qualities. As a result, significant choice prejudice confounds the generalizability of these results [30]. Anticipated future randomized tests may aid clarify the duty for laparoscopic lavage [31].

Conclusion:

Diverticulosis is an illness of modern man, one that remains to trigger significant morbidity and mortality. The large majority of diverticulitis is treatable without surgery. Surgery needs to be provided moderately and just for those patients that have recurrent attacks of real, documented diverticulitis, who have a serious complication of the illness, or that remain in a special category, such as the immunocompromised. The indicators for elective surgery for uncomplicated diverticulitis need to otherwise be modified for each individual patient. In contrast, most clinicians concur that sigmoidectomy is warranted for complicated diverticular disease. Laparoscopic sigmoidectomy is now approved as an advantageous alternative to open surgery in select patients. Laparoscopic lavage might be an alternative for generalised, non-feculent peritonitis.

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