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Choices in surgical treatment of diverticulitis

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ABSTRACT. *Complications after surgical treatment of diverticulitis are not very frequent, in view of the total number of patients affected by this pathology, but they do become significant in absolute terms because of the high prevalence of the disease itself. Surgeons continue to debate which option is better: Hartmann resection or combined resection and anastomosis. Since age is a crucial factor when surgery is being considered, we evaluated the outcome of surgical treatment for diverticulitis in patients treated in our unit over a six-month period, in view of the number of elderly patients generally admitted. Between January 2001 and June 2012, 77 patients underwent surgery for diverticular disease in the Geriatric Surgery Unit of the Department of Surgical and Gastroenterological Sciences, University of Padova Hospital. Gastrointestinal resection and anastomosis were performed in 75 patients (97%), resulting in an overall complication rate of 37% and a mortality rate of 1%. This surgical strategy was chosen because, when it is performed by experienced surgeons, it offers the same results in terms of mortality and morbidity as Hartmann resection, while presenting significant advantages as regards the patient's quality of life. Various factors such as the timing of surgery, severity of the disease defined according to the Hinchev classification, patient's clinical condition, and surgeon's experience and expertise can all influence the surgical choice. Several studies in the literature confirm that combined resection and anastomosis is safe and efficacious, but more research is needed to confirm these data.*

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INTRODUCTION

Diverticular disease of the colon is one of the most widespread diseases, particularly in industrialized countries, and its prevalence is closely correlated with age, reaching values of approximately 65% in patients over 65 years of

age (1). Aging of the general population and dietary habits in western countries, such as low dietary intake of fiber, are important factors which play a key role in the incidence of this disease.

With these considerations, the percentage of patients who develop complications of a surgical nature related to diverticulitis, i.e., about 5% (2), is high in absolute terms, and efforts are needed to define a rigorous diagnostic and therapeutic approach, partly in order to avoid medico-legal consequences for clinicians (3).

Although many reports in the literature are devoted to diverticulitis, few studies are concerned with surgical aspects. Surgeons, in the meantime, continue to discuss what surgical strategy to use in cases of diverticular peritonitis and, in particular, whether to use Hartmann resection or combined resection and anastomosis. There are no randomized clinical trials comparing the two options (2, 4, 5).

Age is certainly an important factor when surgery is considered, as elderly patients are particularly sensitive. Our experience in treating diverticulitis was thus evaluated, as many elderly patients are typically admitted to our unit.

METHODS

We reviewed all the clinical records of patients admitted to our unit for diverticulitis from January 2001 to June 2012. The data gathered and assessed were: number of patients admitted to our clinic for diverticular disease during that period, number attending the out-patient clinic, age, clinical presentation at time of admission, co-morbidities, operative risk (ASA classification), diagnostic instruments used, site of the disease, Hinchev stage, number of patients undergoing surgical treatment, timing and type of surgery, surgical approach (laparotomy or laparoscopy, with its conversion rate), need for post-operative monitoring in the Intensive Care Unit (ICU), length of hospital stay, complications, and post-operative mortality.

Key words: Diverticulitis, complications, elderly patients, Hartmann resection.

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Table 1 - Clinical presentation of patients hospitalized for diverticulitis, January 2001 to June 2012.

Clinical presentation	n	%
(1) Abdominal colic	11	8
(2) Acute abdomen	14	10
(3) Suspected diverticulitis	36	26
(4) Lower GI tract bleeding	33	24
(5) Intestinal occlusion	18	13
(6) Entero-vesical fistula	5	4
(7) Previous episodes of diverticulitis	23	17
(8) Other	3	2

Patients presenting at admission were classified as suffering from: 1) abdominal colic, 2) acute abdomen, 3) suspected diverticulitis (pain associated with fever and leukocytosis), 4) lower gastrointestinal tract bleeding, 5) intestinal occlusion, 6) entero-vesical fistula, or 7) recommended for elective surgery due to previous episodes of diverticulitis (previous bleeding or subocclusive crisis). Post-operative complications requiring further surgery were defined as major complications; minor surgical complications were treated conservatively.

RESULTS

From January 2001 to June 2012, there were 142 (a total of 136 patients) admissions to our unit for diverticular disease. In 73% of these cases hospitalization was urgent. Thirty-three percent of the patients were aged ≥ 80 years, 53% 50-80 years, and 14% ≤ 50 .

Table 1 lists clinical information, and comparative rates were calculated with reference to the 136 patients admitted. The following co-morbidities were assessed: high blood pressure (29%), heart disease (18%), respiratory diseases (9%), diabetes mellitus (6%) and obesity (3%). Patients' surgical risk was classified as follows: 18% in ASA class I, 52% in ASA class II, 29% in ASA class III, 1% in ASA class IV.

The instrumental diagnosis for patients hospitalized for diverticulitis was based on plain abdominal X-rays (96% of cases) and computerized tomography (CT) (71%). When patients presented with bleeding, they underwent endoscopy more frequently (85%). Instrumental investigations confirmed the presence of diverticula in the sigmoid colon in 59% of cases, covering the entire left colon in 37% of cases, and covering the entire colon in 4%. The severity of the disease was defined according to the Hinchey classification in 59% of cases: 57% fell into class I, 28% in II, 11% in III, and 4% in IV.

Of the total number of patients admitted, 77 underwent surgery, 47% as an emergency procedure. Table 2 lists how many of each type of procedure (emergency or elective) were performed. The laparotomic approach was the most frequent (78% of all operations) but, when

Table 2 - Surgical interventions (emergency or elective), January 2001 to June 2012.

Emergency surgery	n	%
(1) Left hemicolectomy without stoma formation	17	23%
(2) Left hemicolectomy with stoma formation	5	7%
(3) Hemicolectomy associated with entero-vesical fistula suture	1	1%
(4) Sigma resection without stoma formation	4	5%
(5) Sigma resection with stoma formation	4	5%
(6) Colostomy formation	2	3%
(7) Right hemicolectomy	3	4%
Total	36	47%
Elective surgery	n	%
(1) Left hemicolectomy without stoma formation	32	43%
(2) Left hemicolectomy with stoma formation	2	3%
(3) Hemicolectomy associated with entero-vesical fistula suture	1	1%
(4) Sigma resection without stoma formation	3	4%
(5) Sigma resection with stoma formation	3	4%
Total	41	53%

surgery was elective, laparoscopy took on an increasingly significant role (39% of elective operations) with a rate of laparotomy conversion of 12.5%. The procedure was carried out during the following times: 86% between 8 a.m. and 5 p.m., 11% between 5 p.m. and 12 p.m., and 3% between midnight and 8 a.m. More than 80% of patients who underwent surgery did not require post-operative monitoring in the ICU. The average hospital stay was 14 days for patients who underwent surgical treatment and 5 days for those treated conservatively. In 63% of cases, the post-operative course was without complications. The rate of minor surgical complications was 17% and of major surgical complications 6%; the rate of medical complications was 14%, and the mortality rate was approximately 1%.

DISCUSSION

On the basis of an investigation conducted in 2008, involving a total of 44 Schools of Surgery in Italy, it was found that Hartmann resection is still a widely used procedure in Italy for patients with diverticular peritonitis. The statistics are completely different in our unit, as all operations carried out for this pathology over the past 11 years have been the combined resection and anastomosis procedure. A protective stoma was found to be necessary in about 20% of all cases treated. This procedure was preferred because, when it is performed by an experienced colon-rectal surgeon, it does not cause more co-morbidities or mortality but does guarantee better quality of life for the patient. Patients who undergo Hartmann resection are often not subjected to subsequent recanalization,

which is comparable to a major operation having the same risks as the resection. These patients therefore live with a stoma for the rest of their lives, with all the consequences that this has on the quality of their lives and their relationships.

Combined colon resection and anastomosis, with or without a diverting stoma, is certainly a technically more difficult and longer operation, even for the most expert surgeons, because the splenic flexure must be mobilized and an anastomosis must be constructed, but the advantage of immediate recanalization is undeniable.

Our results are satisfactory with regard to both post-operative complications and associated mortality. Trenti et al. (2) compared the two strategies in a non-randomized study of 87 patients who were operated in emergency. They concluded that Hartmann resection should be reserved exclusively for high-risk, hemodynamically unstable patients; that combined resection and anastomosis is not characterized by greater complications or mortality; and that results regarding the all-in-one operation are even better if surgeons are specialized in colo-rectal surgery. In a systematic review of surgical treatment in patients with diverticular peritonitis, Salem et al. (6) evaluated data from 54 studies for a total of 1051 patients who underwent Hartmann resection, and another 50 studies for a total of 569 patients who underwent combined resection and anastomosis. They came to the conclusion that the all-in-one operation does not cause greater mortality or morbidity with respect to Hartmann resection. However, they confirmed that prospective, randomized clinical studies were needed to avoid possible selection bias. Post-operative outcomes in patients who underwent emergency operations for perforated diverticulitis were studied by Mueller et al. (4), who concluded that anastomotic dehiscence was associated with patient comorbidity and with the severity of the perforation evaluated according to the Hinchey classification. In any case, the choice of which surgical strategy to follow should be made on the basis of the patient's clinical condition rather than on the extent of intra-operative feedback. There are also other factors which may influence the surgical decision, including timing of the operation, which may be scheduled or else carried out in emergency conditions, sometimes coinciding with a holiday, as reported by Constantinides (7).

In our own experience, we may safely state that the number of operations carried out in our unit during the night hours is very small. This fact, on one hand, is due to the number of our case reports and, on the other, it reflects the preference in our institute to put off an emergency operation whenever this is possible without creating greater risk for the patient. A recently published population-based American study on 31,832 patients (8) reported that patients admitted for acute diverticulitis on holidays were more frequently subjected to Hart-

mann resection and had worse outcomes with respect to those admitted on normal weekdays. Further studies are needed to define the cause of this "week-end effect", but it probably reflects the importance of specific colo-rectal surgical experience. Surgeons who work in this field prefer combined resection and anastomosis with respect to those who are younger, less experienced or specialized in general or some other surgical field.

Our data are limited as regards numbers of patients studied and also the number of more serious cases treated. Our preference for combined resection and anastomosis to treat complicated diverticular disease is supported by results which appear to be consistent with larger case studies.

CONCLUSIONS

Official guidelines on the surgical treatment of diverticular diseases are not yet available, and the choice between surgical options appears to be influenced by many factors such as intra-operative feedback, patient's general clinical condition, timing of the operation, and surgeon's specific experience. Some reports in the literature, like our own, indicate that the combined resection and anastomosis option is more advantageous than Hartmann resection. With respect to the latter, although associated with the same mortality and morbidity, a second important operation or worsening of the patient's quality of life is avoided. Further research and, in particular, randomized clinical trials, are of course indispensable.

Disclosure statement

The authors have nothing to disclose.

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