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Surgical treatment for recurrent *diverticulitis*: a case report

Tratamento cirúrgico para *diverticulite* de repetição: um relato de caso

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ABSTRACT

Case presentation**:** MIBV patient, female, 75 years old, diagnosed with diverticular disease of the colon for years, with sporadic episodes of diverticulitis, however in 2019 the pictures of acute diverticulitis began to increase in frequency. With several episodes of diverticulitis and conservative treatments, 2019 had 4 episodes, presenting sigmoid colon thickening suggestive of neoplasia, but discarded with colonoscopy, in 2020 patient presented 5 episodes and in 2021 6 episodes in a period of 6 months, generating a picture of chronic pain and altered bowel habit. Surgery was indicated, and an elective open rectosigmoidectomy was performed; the patient received a diet on the second postoperative day and was discharged on the fifth day. Maintained outpatient follow-up with no new episodes. Discussion: Most patients with acute sigmoid diverticulitis are treated clinically, surgery is only indicated when the diverticulitis is untreatable or refractory to clinical therapy, about 10% to 15% of patients require surgery. For patients who require surgery for diverticulitis, the choice of technique depends on the patient's hemodynamic

stability, extent of peritoneal contamination, and surgeon experience/preference. The major benefit of surgical treatment of diverticular disease is the cessation of episodes of diverticulitis, as studies show that patients with 1 or 2 episodes of acute diverticulitis, treated medically, required surgery for recurrent disease in up to 45% of cases. Final Comments: Indications for surgical treatment should be individualized to achieve the best outcome, as shown in this case, in which elective surgery resulted in complete cessation of diverticulitis episodes. The choice of resection method, open or laparoscopic, should consider the availability of equipment and the physician's training for the procedure, always taking into account the best resolution with fewer complications and mortality. Abbreviations and acronyms: IQR: interquartile range, CT: computed tomography, USG: ultrasonography

Keywords: *Diverticulitis*, *diverticulosis*, *diseases of the sigmoid colon*.

1 INTRODUCTION

One of the benign diseases of the colon is diverticulosis, which refers to the presence of diverticula, which are herniations of the colon wall, forming small pockets. Diverticula can be classified into true diverticula (herniation of the entire intestinal wall) and false diverticula or pseudodiverticula (only the mucosa and submucosa bypass the muscle layer) as occurs in diverticular disease [1]. Diverticulitis is inflammation of these diverticula, usually caused by microperforation, with the sigmoid being the most prevalent site[1, 2].

The prevalence of diverticular disease has increased in industrialized nations in recent decades and is associated with a mean hospital stay of 4 days and an average cost of treatment of US$ 633.8[8]. Acute diverticulitis may affect up to 15% of patients with diverticular disease, and although its incidence increases with advancing age, there has been an increase, in recent years, of cases associated with young patients[1].

Acute diverticulitis can be categorized as complicated or uncomplicated. Uncomplicated diverticulitis presents characteristic symptoms such as pain in the left lower quadrant, low-grade fever, anorexia, nausea and vomiting, and moderate leukocytosis. Complicated diverticulitis, on the other hand, in addition to these symptoms, presents mucus secretion, diarrhea, and obstructive pictures in the Gastro Intestinal Tract. The best imaging exam for the diagnosis is the abdominal computed tomography (CT), which also provides details for staging, through the Hinchey and Kaiser criteria, directs the most appropriate treatment[1,6].

Patients with outbreaks of diverticular disease are increasingly being treated on an outpatient basis, with fewer urgent and emergency surgical procedures[9]. Approximately 25% of patients with diverticulitis develop complications associated with the condition, the main one being abscess formation, which can reach up to 17% of complicated cases. [1]. It has a direct

relationship with age, with prevalence increasing to around 40 to 80% after 60 years of age[1]. One of the modifiable risk factors is the deficient intake of fiber in food, in addition to obesity, physical inactivity and smoking [1,3 e 4].

The treatment of complicated diverticulitis can be based on the Hinchey criteria. It is known that in the early stage, patients respond well to conservative treatment with broad spectrum antibiotics. Those with larger, peridiverticular (> 4cm) abscesses benefit from ultrasound (USG)- or CT-guided percutaneous drainage associated with antibiotic therapy. Patients with complicated diverticulitis, Hinchey III or IV, are more severe patients with signs of peritonitis and even sepsis. They need to be
stabilized and undergo emergency surgery. The priority in these cases is to control the inflammatory response, resect the diseased tissue, and restore intestinal transit[7].

Cases of uncomplicated diverticulitis do not require surgery in most cases. Clinical therapy with spectrum antibiotics for gram-negative and aerobic antibiotics is performed for a period of 7 to 10 days. Improvement is expected within 48 to 72 hours. However in cases of recurrent diverticulitis, where the chance of complications increases, such as stenosis, perforations, among others, there is scientific evidence that elective resection can improve functional outcomes and quality of life for those who remain symptomatic, as well as avoid long-term complications, and reduce the chance of emergency surgery and hospitalizations.[1,2].

Among the various surgical options we can mention the three-stage surgery (with colostomy and drainage in the first stage), Hartmann's surgery, resection with primary anastomosis with or without protective stoma and, more recently, the cleaning and drainage of the cavity by laparoscopic approach with elective reapproach. Thus, to avoid aggressive and emergency surgeries, the elective procedure, which foresees the patient's complication, allows better long-term results, with reduced morbidity and mortality, and an earlier return to work [7].

Although diverticular disease affects any segment of the large intestine, this case report aims to report on the paradigm shifts in the treatment of patients with diverticulitis of the left colon.

2 CASE DESCRIPTION

The following case presents the medical management of a patient with acute diverticulitis after numerous episodes over a 2-year period, with local complications such as sigmoid colon thickening and chronic pain. Patient MIBV, female, 75 years old, resident of Presidente Prudente, in outpatient follow-up in 2019, with several episodes of recurrent diverticulitis, including

requiring hospitalizations, presented altered anatomy of the sigmoid colon, with thickening of the same (image 1 and 2), evolving with chronic pain in left iliac fossa and left hypochondrium.

In the several episodes of uncomplicated acute diverticulitis, conservative treatment was always chosen, with antibiotic therapy, with positive results, obtaining improvement of symptoms. However, the patient had 4 more episodes in the same year, 5 episodes of acute diverticulitis in 2020, and in 2021 she had 6 crises of diverticulitis in a period of 6 months, with two hospitalizations, generating a limiting picture of chronic pain.

For this reason, an elective open rectosigmoidectomy was chosen due to recurrent diverticulitis (Image 3). Pathology of the large intestine segment, product of the colectomy, confirmed the diagnosis of colonic diverticulosis (diverticular disease) with incipient diverticulitis. The patient received a diet on the 2nd postoperative day and was discharged on the 5th postoperative day.

Image 1 - CT of the abdomen in portal phase, axial section, demonstrating wall thickening of the left colon with diverticula

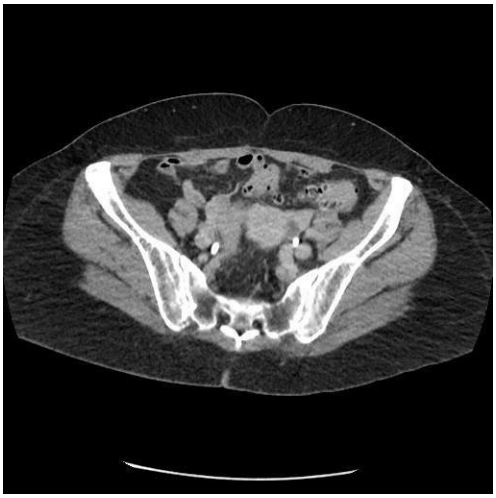

Image 2: CT of the abdomen in portal phase, sagittal section, thickening and diverticula in the rectosigmoid.

Image 3: Surgical specimen, product of rectosigmoidectomy.

3 DISCUSSION AND LITERATURE REVIEW

Classic findings related to sigmoid diverticulitis include left lower quadrant pain, fever, and leukocytosis. Physical examination, complete blood count, urine test, and abdominal radiographs can be helpful in refining the differential diagnosis. Recently, a diagnostic prediction model has shown that evaluation of abdominal defense, CRP, and leukocytosis when absent demonstrates a 96% negative predictive value for detecting complicated diverticulitis[10.]

Computed tomography (CT) has become a standard tool for elucidating acute abdominal complaints, performing differential diagnosis, and assessing the severity of the disease, with specificity and sensitivity of 95% when performed with contrast[11]. Magnetic resonance imaging can be an alternative in the initial evaluation of a patient with suspected diverticulitis when the patient is allergic to contrast or in pregnant women, while ultrasound is useful to rule out another cause of abdominal or pelvic pain that can simulate diverticulitis .[11,12,13]

The use of antibiotics has been considered standard treatment for patients with diverticulitis, but new studies suggest that the pathology is linked to the inflammatory process that can result in microperforation, and not the opposite. Studies have shown that there is no significant difference in patients with uncomplicated diverticulitis treated without antibiotics with regard to disease recurrence, complications, readmission rates, need for surgery, or mortality[14,15,16]. Thus, data suggest that antibiotic therapy may not be necessary in healthy patients with uncomplicated diverticulitis in the early stages, but its use remains appropriate for higher risk patients with significant comorbidities, signs of systemic infection or immunosuppression.

Complicated diverticulitis with abscess formation occurs in 15% to 40% of patients presenting with the condition in the sigmoid colon, in general non-operative treatment is successful in 80% of cases. Smoking cessation, reduced meat intake, physical activity, and weight loss are interventions that can reduce the risk of diverticulitis
17,18,19.

Sharma[20] demonstrated that the risk of malignancy in complicated diverticulitis can be as high as 11% and 0.7% in uncomplicated diverticulitis, so after an episode of acute complicated diverticulitis an endoscopic evaluation of the colon should be performed to confirm the diagnosis if the patient does not have recent tests[20,21].

The Statewide Planning and Research Cooperative System (New York State) study evaluated 10342 patients who had a diverticular abscess. Of this group, 3270 patients (32%) underwent surgery within 30 days of diagnosis, 1660 (24%) underwent elective colectomy within 6 months, 5412 patients who did not undergo the surgical procedure had higher recurrence, being stipulated at 24.8% (IQR, 93.5-707) when compared with the other groups[22].

Elective colectomy should usually be recommended for patients with diverticulitis complicated by fistula, obstruction or stenosis. As for the risks of recurrence or complications for younger patients (younger than 50 years) versus older patients, more recent data suggest that age does not increase the risk of worse clinical outcomes, but younger patients tend to have more recurrence due to survival[23]. Thus, age does not seem to be a reliable parameter for the indication of elective resection.

The decision to indicate elective sigmoid colectomy after acute uncomplicated diverticulitis should be individualized; a study suggests that the estimated risk of emergency surgical intervention after recovery from an uncomplicated outbreak is 1 in 2000 patients, but with an increasing risk of more attacks. Consideration of elective colectomy after repeated uncomplicated diverticulitis flares should take into account operative risks, frequency and severity of previous flare-ups (e.g., time away from work, need for hospitalization), persistent residual symptoms related or attributed to previous attacks, operative morbidity[24].

When assessing quality of life after elective surgical intervention, research demonstrates patient-reported benefits. The DIABOLO study reports that surgery is effective in relieving persistent symptoms after an attack of acute diverticulitis, but the surgical decision should be individualized through shared decision making, including persistent symptoms and lifestyle limitations[25].

Although most patients hospitalized for diverticulitis respond to non-operative treatment,

15% to 32% may require emergency surgery. Indications for emergency surgery include patients with diffuse peritonitis or an exacerbated systemic inflammatory response that occurs due to purulent or fecal peritonitis. These patients usually require volemic resuscitation, antibiotic administration, and operation. Predictors of mortality include age >80 years, ASA class 4 or 5, serum creatinine >1.2 mg/dL and an albumin <2.5 g/dL, patients with 2, 3 or 4 of these predictors had a 30-day mortality rate of 10%, 22.9% and 53.4%[26].

Patients who do not clinically improve with drug therapy, continue to have significant abdominal pain, or are unable to tolerate feeding are usually recommended to undergo colectomy, There are a small proportion of highly selected and stable patients with perforated diverticulitis, even with pneumoperitoneum but without diffuse peritoneal findings, who can be successfully treated without surgical intervention in an attempt to convert the procedure to elective, and thus try to decrease morbidity[27] .

Although Hartmann's procedure was once considered the standard for emergency surgery in diverticulitis, new studies demonstrating significantly better morbidity and mortality rates after resection and primary anastomosis with or without stoma confection. Primary anastomosis with ileostomy appears to be a safe alternative to Hartmann's procedure in the emergency setting [28,29, 30, 31]. Recent data show that despite recommendations for primary anastomosis, adoption rates of this approach remain low (3.9%). The decision to reconstruct the intestinal transit or to perform a proximal bypass in the setting of a primary anastomosis should be individualized taking into consideration the risks associated with anastomotic failure. The parameters that are usually analyzed to opt for colostomy or the Hartmann procedure include intraoperative and patient factors, such as hemodynamic instability, acidosis, acute or chronic organ failure, and immunosuppression[32].

Some patients with purulent peritonitis (Hinchey III) can be treated with laparoscopic lavage and decrease the length of stay, morbidity, and stoma risk associated with a sigmoid colon resection. However, laparoscopic lavage is also associated with an increased risk of unresolved or recurrent diverticulitis, abscess formation and blocked perforation, fecal peritonitis, fistula, and sigmoid adenocarcinoma. It is concluded that further studies are needed to better identify the selection criteria for patients who may benefit from laparoscopic lavage .[33,34,35]

Patients with uncomplicated acute sigmoid diverticulitis are mostly treated clinically, surgery is only indicated when the diverticulitis is untreatable or refractory to clinical therapy, about 10% to 15% of patients require surgery [2,5]. As occurred in the reported case, in all episodes of uncomplicated acute diverticulitis, conservative treatment was chosen, with a positive

momentary result.

Emergency surgery increases mortality due to complications inherent to the patient and their health status, the American Society of Coloproctology recommends elective surgery for potentially serious patients with a previous episode of complicated diverticulitis, as some studies show that these patients are at higher risk of developing complications or dying from a recurrent crisis, and therefore benefit from early elective surgery[2]. Other indications for elective surgery are after percutaneous drainage of complicated diverticulitis, to avoid recurrent sepsis (occurs in up to 41% of patients) or due to inability to exclude neoplastic disease[7]. According to the reported case, elective surgery was indicated because the patient presented with several episodes of aggravation, including with previous hospitalizations and anatomical alteration of the organ, foreseeing complications and aiming to improve the quality of life, surgery was indicated.

The major benefit of surgical treatment of diverticular disease is the cessation of episodes of diverticulitis, as studies show that patients with 1 or 2 episodes of acute diverticulitis, treated clinically, required surgery for recurrent disease in up to 45% of cases[7].

4 CONCLUSION

Diverticulitis is the third most common gastrointestinal disease requiring hospitalization and is the main indication for elective colon resection, thus understanding the disease and its complications is important for determining a treatment of a disease that is increasingly emerging and present in the elderly population and/or lacking proper eating habits.

The surgical principles are the same for complicated and uncomplicated diverticular disease. Although the proximal resection margin should be in the healthy, flexible colon without gross evidence of inflammation, it is not necessary to resect all proximal diverticula, the distal resection margin should be in a healthy rectum because anastomosis in the distal sigmoid is associated with a higher risk of recurrent diverticulitis[36,27].

The indications for surgical treatment should be followed to have the best prognosis, as demonstrated in the case, in which elective surgery resulted in complete cessation of episodes of diverticulitis. And the choice of resection method, open or laparoscopic, should consider the availability of equipment and the physician's training for the procedure, always taking into account the best resolution with fewer complications and mortalities.

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