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Introductory Chapter: Diverticle Disease of the Colon—DDC

José Joaquim Ribeiro da Rocha and Marley Ribeiro Feitosa

1. Introduction

This book is intended to review, update and bring a wide knowledge of the diverticular disease of the colon and its own relationships in search of better driving in diagnosis and treating this morbidity so frequently in our media.

In this chapter introducing the book, we have an approach of all the relevant aspects with respect to anatomy, etiopathogenesis, symptoms, diagnosis, complications and treatment of diverticular colon disease. In the following chapters, the other authors present their experiences and their research on specific topics related to diverticular colon disease.

2. General considerations about colon diverticular disease

The large intestine diverticules are small hernias on the wall of the large intestine, composed of mucosa and submucosa that inherit by the lay of the smooth intestine musculature (**Figures 1–3**).

Colonic diverticulum is acquired, and pulsional diverticula are under the influence of increased intraluminal pressure, which promotes mucous herniations that

Figure 1.
Diverticules—internal vision by the colic lumen.

Figure 2.
Diverticules—external vision by the serosa surface of the colon.

Figure 3.
Pancolonic diverticular disease.

protrude through points of weakness in the intestinal wall where blood vessels enter (**Figures 4 and 5**).

Several authors, since 1849, have been pioneers in the description of the diverticula on the intestine wall, among them are Cruveilhier, Haberson and Sidney Jones [1–4].

The history of diverticular disease can be divided into some phases according to Painter and Burkitt [5].

Figure 4.
Anatomy of a colonic diverticulum.

Figure 5.
Penetrating vessel in the diverticular ostium.

- Illness as a curiosity
- Recognition of the disease as a clinical problem
- Diverticular disease as a growing problem
- Surgical intervention for its treatment
- Etiopathogenesis involving the muscles of the intestinal wall

Consider a Western man's disease, 30% of cases affect people up to 60 years old and 60% up to 80 years old. From the fifth to the ninth decade of life, the incidence ranges from 5 to 50% of the general population.

The great majority of patients are asymptomatic (75%), in young people, under 50 years, the evolution is usually more aggressive and in the elderly over 60 years, there is a greater risk of hemorrhage. Urgent surgery occurs in about 5% of cases [6, 7]. Over time, new knowledge about etiopathogenics, its complications, diagnosis and treatment was discovered [8–10].

There is no specific cause. Physiopathology is based on the hypertonia of the smooth musculature of the intestinal wall with increased intraluminal pressure of the large intestine, favoring this hernia on the intestine wall.

Since the twentieth century, the incidence of DDC, whether by the clinical and laboratory diagnosis or by the finding of autopsies, is more common in industrialized countries and less frequent in developing countries [11].

As a degenerative disease is considered in the intestine wall, it is most frequent over 50 years of age, but there are cases in younger individuals. There is no significant relationship as to gender, but there is as to family background, that is, hereditary.

The etiopathogenesis of DDC has been related to factors such as the poor fiber diet, changes in colon motility, collagen function in the intestine wall, genetics and age [12, 13].

In recent reviews, it has been speculated about the enteric nervous system in DDC [14].

Inflammation is the most common manifestation (diverticulitis), which is much more frequent in the diverticulum of the sigmoid colon. Diverticulitis can be acute, the most common form; however, there are patients who present the chronic form, with periods of acute inflammation.

In the natural history of acute diverticulitis, symptoms affect approximately 10 to 25% of patients with diverticular disease. The sigmoid is involved in 90% of cases. There is a palpable mass in 20% of cases. The incidence increases with age and mostly responds to treatment with clinical measures.

Seizures are recurrent 30 to 60% of the time, 50% in the first year and 90% up to 5 years later.

About 70 to 80% have intermittent symptoms, and about 25% after the first hospitalization will require a new hospitalization.

There is surgical indication in 10 to 30% of cases. Complicated forms appear 25% of the time after the first attack and 60% of the time after the second attack [15, 16].

Diagnosis is based on physical and image examinations and colonoscopy, opportunely indicated.

Computerized tomography is the examination of choice for uncomplicated acute diverticulitis and also complicated diverticulitis with high sensitivity and specificity (**Figure 6**). Colonoscopy must be avoided in the acute inflammatory activity phase due to perforation risk but must be carried out after the acute framework resolution to exclude other injuries such as colorectal neoplasms [17, 18].

Acute diverticulitis complicated with surgical indication depending on the stage well established by Hinchey [19] (**Figures 7 and 8**).

The patient's systemic state will direct it to make a stoma or not [20–22].

In the differential diagnosis of acute diverticulitis, there are several pathologies such as: acute appendicitis, Crohn's disease, gastroenterocolitis, colorectal cancer, intestinal obstruction of another origin, ischemic colitis, gynecological disorders, Meckel's diverticulitis appendagites, lithiasis and/or urinary infection and irritable bowel syndrome [23, 24].

Other less frequent ways of presentation are complicated acute and/or chronic diverticulitis, with abdominal abscess (**Figures 9 and 10**), peritonitis, perforation (**Figure 11**), bladder, vagina and cutaneous fistulas (**Figures 12 and 13**). Another complication is stenosis (**Figure 14**), caused by fibrosis and inducing intestinal obstruction [7, 25].

Figure 6.
Acute diverticulitis with thickening of the wall, blurring of pericolic fat and adherence to the bladder wall.

Figure 7.
Hinchey II—large abdominal abscess.

Figure 8.
Hinchey III—diverticulitis with purulent peritonitis.

Figure 9.
Diverticular diseases abscess pericolic—left flank.

Figure 10.
Diverticular diseases abscess pericolic—left iliac fossa.

From the anatomic and clinical point of view, we can divide diverticular disease in hypertonic diverticular disease, restricted to the sigmoid colon where the biggest complications occur, habitually accomplishing the youngest individuals until seventh decade. The other way, hypotonic called is when all the large intestine is involved and in this case, the main complication is the enterorragia, accommodating elderly individuals. There are patients who present the two forms [26, 27].

The most frequent cause of lower gastrointestinal bleeding in patients over 60 years of age is colonic diverticular disease. It occurs most frequently in the right colon where the ostia and cupola of the diverticula are wider and thinner and therefore have greater exposure of the penetrating vessels. About 50 to 90% bleed in the right and transverse colon. About 20% of patients with diverticular disease may bleed over their lifetime. About 25% may have recurrent bleeding and 5% may have massive bleeding. About 80% of the time the bleeding stops spontaneously.

Of those patients who need more than four units of blood a day, 60% will need urgent surgery. During rare blood-type situations, transfusion difficulties, rebleeding after bleeding has stopped, and massive transfusions and when blood loss is greater than replacement, colectomy is indicated. The postoperative mortality rate is 9%.

Surgery depends on the location of the bleeding point, which can be investigated by scintigraphy, arteriography or colonoscopy (**Figure 15**).

Figure 11.
Diverticular disease perforation.

Figure 12.
Perforation and fistula colo-cutaneous.

Three conditions are important in deciding which surgery to perform: 1. Clinical conditions and patient characteristics. 2. Experience of the surgeon. 3. Location of bleeding.

The ideal surgery is segmental or total colectomy with an ileum colon or an ileum rectus anastomosis.

Figure 13.
Sigmoid—vesical fistula air in the top of the bladder.

Figure 14.
Diverticular diseases stenosis of the sigmoid colon.

Figure 15.
Colonoscopy showing the point of bleeding from diverticulum.

The likely surgery is total colectomy with ileum rectus anastomosis and protective ileostomy. The safest surgery is total colectomy with terminal ileostomy and burial of the rectal stump (**Figure 16**) [28–30].

An atypical presentation is segmental colitis associated with diverticular disease (SCAD), inflammatory disease that mimics inflammatory bowel diseases with variable intensity from slight to deep ulcerations (**Figure 17**) and which requires adequate cure treatment [31–33].

Prevention of complications, food and personal habits are controversial topics and this book hopes to help in this clarification.

Clinical or surgical treatment is guided by symptoms and complications [34–38].

Figure 16.
Diverticular diseases pancolectomy for severe hemorrhage.

Figure 17.
Sigmoid segmental colitis (edema + hiperemia + ulcerations).

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Author details

José Joaquim Ribeiro da Rocha^{1*} and Marley Ribeiro Feitosa²

1 USP Medical School, Ribeirao Preto, Brazil

2 Faculty of Medicine of USP, Ribeirao Preto, Brazil

*Address all correspondence to: ribeiro.rocha0717@gmail.com

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