Original Article

Simple and complicated rectal diverticula: endoscopic analysis of a case series from Brazil

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ABSTRACT: **Introduction:** Diverticular disease of the colon is a very common condition, present in most of the elderly population. However, the occurrence of rectal diverticula is extremely unusual. It is typically an incidental finding at colonoscopy. **Objective:** Describe epidemiological, clinical, surgical and endoscopic characteristics of a case series of rectal diverticula in Brazil. **Methods:** Four patients with rectal diverticula were analyzed in terms of symptomatology, associated conditions and colonoscopy findings. Endoscopic findings were discussed individually. **Results:** The prevalence of rectal diverticula at our endoscopy unit was 0.15% of all colonoscopies, affecting 0.74% of patients with colonic diverticulosis. The endoscopic analysis showed the diverticulum ostium with mean size of 2.3 cm, depth of 2.8 cm and anal margin distance of 6.8 cm. Colonoscopy also demonstrated simple rectal diverticulum in all patients. Diverticula were located in the anterior, right lateral and posterior walls of the rectum. One patient developed diverticulitis as complication and underwent to diverticulectomy. **Conclusions:** Rectal diverticulum is an incidental finding at colonoscopy and associated with diverticulosis. Its rarity and specific colonoscopic characteristics make it a unique entity. Asymptomatic in most cases, it rarely needs intervention. Surgery is reserved for complicated cases.

Keywords: diverticulum; diverticulosis, colonic; colorectal surgery; colonoscopy.

RESUMO: **Introdução:** Diverticulose é uma condição muito comum, presente em grande parte da população idosa. Divertículo retal, entretanto, é condição rara. Geralmente é um achado incidental em colonoscopias. **Objetivo:** Descrever as características epidemiológicas, clínicas, cirúrgicas e, especialmente, endoscópicas de uma série de casos de divertículos retais no Brasil. **Métodos:** Quatro pacientes com divertículos retais são analisados em relação a sintomatologia, condições associadas e colonoscopias. Os achados endoscópicos são discutidos especificamente. **Resultados:** Em nosso Serviço de Endoscopia, a prevalência de divertículos retais foi de 0,15% de todas as colonoscopias realizadas e de 0,74% em pacientes portadores de diverticulose. Análise endoscópica revelou tamanho médio do óstio do divertículo de 2,3 cm, profundidade de 2,8 cm e distância da margem anal de 6,8 cm. Colonoscopia demonstrou presença de divertículo retal único em todos pacientes, os quais se localizaram nas paredes anterior, lateral-direita e posterior do reto. Um dos pacientes apresentou diverticulite como complicação, sendo submetido à cirurgia de diverticulectomia. **Conclusões:** Divertículo retal é um achado incidental em colonoscopias, estando associado à diverticulose. Sua raridade e seus aspectos endoscópicos específicos tornam importante o reconhecimento como uma entidade única. Assintomático na maioria dos casos, raramente necessita intervenção. Cirurgia está reservada para os casos em que ocorrem complicações.

Palavras-chave: divertículo; diverticulose cólica; cirurgia colorretal; colonoscopia.

INTRODUCTION

Diverticular disease is a common condition in western and developed countries. Its prevalence increases with age, observed in more than 50% of population over 80 years old, according to some series[1,2]. However, the presence of rectal diverticula is extremely unusual. According to some studies, this condition is found in only 0.07 to 0.08% of contrast enemas[3,4] and in 2 to 2.4% of the patients with colonic diverticu-

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losis[4,5]. Recent estimates say that less than 50 cases of rectal diverticula have been described in the world[6].

METHODS

Four patients with rectal diverticula admitted at the Department of Gastroenterology and Surgery at the Hospital Universitário de Santa Maria from 1999 to 2009 had their clinical and epidemiological information collected and recorded in individual archives. All patients were submitted to colonoscopy in this period at the Service of Digestive Endoscopy of the Department of Gastroenterology. The measurements of diverticula were defined by visual estimates through imaging comparison with open biopsy clips inserted through the colonoscope. Additional imaging exams were also performed. All clinical data were collected directly from the patient and confirmed through review of patient's records. The information is presented separately by case and the endoscopic findings are discussed individually.

Patient 1

SSK, a 72-year-old female patient, complaining of pain in the left iliac fossa for 2 weeks. The pain was usually alleviated after evacuations. She presented history of hemorrhoidectomy, smoking, arterial hypertension and obesity. Colonoscopy showed multiple diverticula in the transverse colon and the sigmoid colon, and one diverticulum in the right lateral wall of the rectum. This simple diverticulum ostium had mean size of 3 cm, depth of 2 cm and anal margin distance of 6 cm (Figure 1). Abdominal computed tomography (CT) and barium enema confirmed colonic diverticulosis, as well as a rectal diverticulum. No specific procedure was performed for the rectal diverticulum. The treatment consisted in dietetic directions and fiber supplement.

Patient 2

MCCB, a 59-year-old female patient, with pain in the left iliac fossa and diarrhea, alternating with constipation for 2 weeks. Except for obesity, she did not present significant medical history. Colonoscopy showed diverticular disease in the descending colon and the sigmoid colon, associated with diverticulum in the posterior wall of the rectum. This diverticulum presented unusual ostium size of 0.7cm, depth of 1 cm during insufflation, elevated margins and 6.5 cm anal margin distance. Chromoscopy with methylene blue was used to highlight the findings (Figure 2). The treatment was similar to that adopted for Patient 1, based on dietetic directions for colonic diverticulosis.

Patient 3

GPR, a 77-year-old male patient, with constipation and anal discomfort for 7 months. Medical history

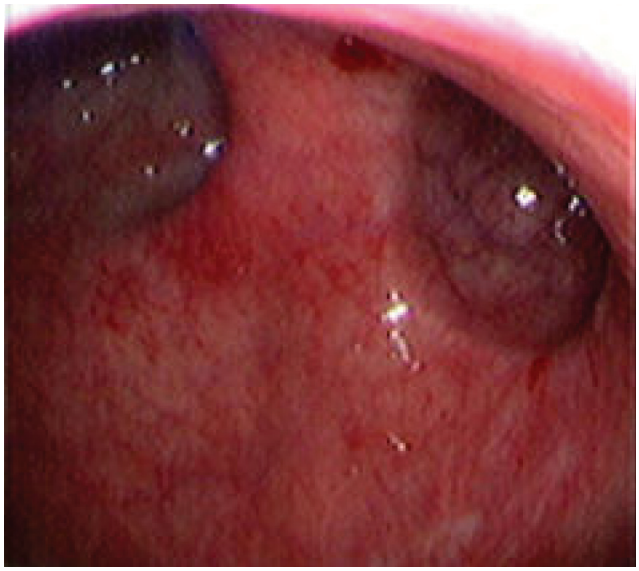

Figure 1. *Large rectal diverticulum with ostium size of 3 cm in the right lateral wall of the rectum.*

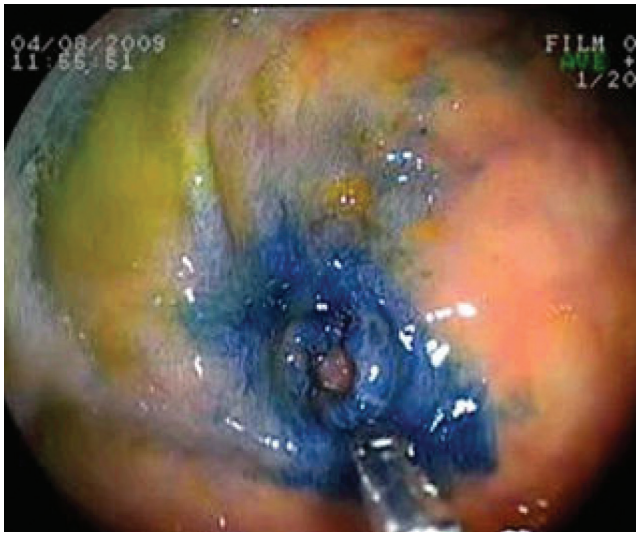

Figure 2. *Small rectal diverticulum with size of 0.7 cm, central depression and elevated margins in the posterior wall of the rectum.*

of chagasic megacolon treated with surgery (Duhamel technique) 14 years before. Smoker, also had hypothyroidism, systemic arterial hypertension and diabetes mellitus. Colonoscopy showed diverticular disease in the remaining colon, atony and rectal dilation, anatomical alterations related to the Duhamel procedure and a rectal diverticulum with ostium size of 2.5 cm in the posterior wall. The diverticulum depth was 3 cm, and it was 7 cm from the anal margin (Figure 3). The treatment was also based on dietetic recommendations.

Patient 4

AZ, a 56-year-old male patient, with frequent episodes of intense pain in lower abdomen and anorectal region, associated with constipation for 6 months. He also reported pollakiuria and occasional dysuria. Smoking is his only associated factor. Abdominal CT and barium enema showed colonic diverticulosis in the descending colon and sigmoid colon and a large diverticulum in the anterior wall of the rectum (Figure 4). Colonoscopy confirmed the presence of rectal diverticulum filled with fecaloma, with ostium size of 3 cm and 8 cm of anal margin distance (Figure 5). Pelvic ultrasound showed that the diverticulum diameter was 5.3 cm, with bladder compression, which explained the urinary symptoms of the patient (Figure 6). The patient was submitted to a simple diverticulectomy to treat the rectal diverticulum. The histopathological analysis of the resected diverticulum showed normal colonic tissue. The patient was asymptomatic two years after the diverticulectomy.

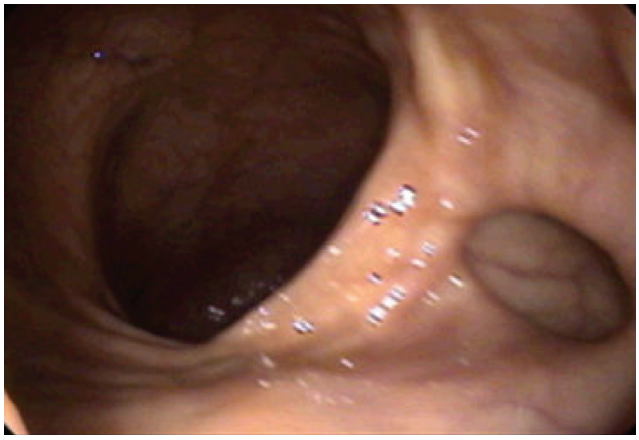

Figure 3. *Anatomical alterations due to Duhamel surgery associated with 2.5 cm diverticulum in the posterior wall of the rectum.*

RESULTS

The age of our patients ranged from 56 to 77 years old and there were no difference in the prevalence in terms of gender. The associated conditions were: obesity, smoking, systemic arterial hypertension, diabetes mellitus, hypothyroidism, Chagas disease and anorectal surgery. Diverticular disease of the colon was associated in all patients.

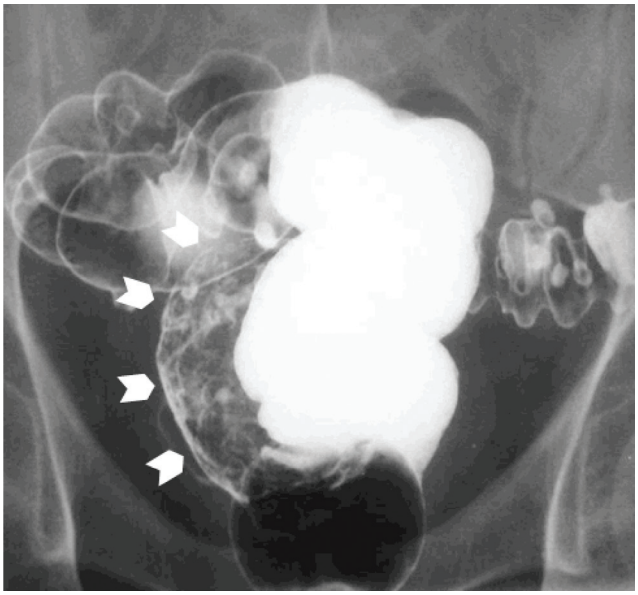

Figure 4. *Barium enema showing diverticular disease in sigmoid colon and a large diverticulum in the anterior wall of the rectum (arrows).*

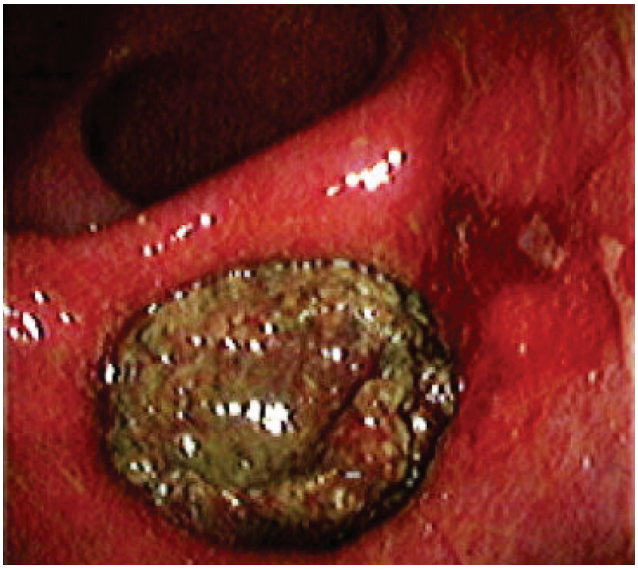

Figure 5. *Rectal diverticulum filled with fecaloma in the anterior wall.*

Three diverticula were classified as simple, as they were asymptomatic, with patients' complaints related to colonic diverticulosis or prior surgical procedure. No specific treatment to rectal diverticulum was indicated to these patients. One patient had rectal diverticulum classified as complicated, due to the presence of local diverticulitis. Diverticulectomy was performed in this patient, who remained asymptomatic 2 years after the procedure.

Colonoscopy

In 2,660 colonoscopies performed in 10 years, our endoscopy unit detected only 4 cases of rectal diverticulum, with prevalence of 0.15% in all colonoscopy procedures. Diverticular disease was found in 543 colonoscopies, leading to the prevalence of rectal diverticulum of 0.74% in these patients. Colonoscopy showed diverticulum ostium with mean size of 2.3 cm, depth of 2.8 cm and anal margin distance of 6.8 cm (Table 1). Colonoscopy also showed the presence of simple rectal diverticulum per patient, located in the anterior, right lateral and posterior walls of the rectum. Complicated rectal diverticulum presented larger dimensions, as well as greater distance from the anal margin, when compared to simple diverticula (Table 2). Colon evaluation showed diverticular disease in all patients, as well as anatomical alterations related to the Duhamel procedure in one patient with chagasic megacolon.

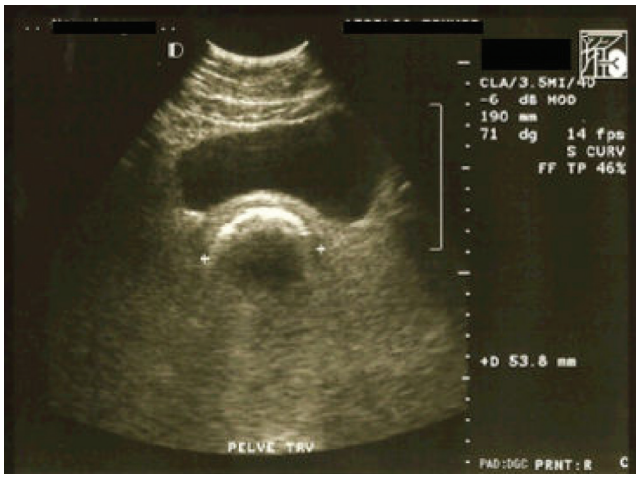

Figure 6. *Pelvis ultrasound showing bladder compression caused by a 5.3 cm rectal diverticulum.*

DISCUSSION

Diverticular disease of the colon is a frequent condition, especially in western and industrialized countries. Its actual prevalence is difficult to define, as most patients are asymptomatic. However, studies that analyzed barium enemas and necropsies indicate that this disease is closely related to age[1,2]. Some studies report prevalence of 30% in patients over 50 years old, 50% in patients over 70 years old and 66% in patients over 85 years old[1,2]. The sigmoid colon is the most affected segment, involved in up to 70% of the cases. The descending colon is involved in 10% of the cases and the transverse colon and ascending colon, in 2 to 10%. The pancolonic form is found in 10% of the patients[1,2]. In 2,560 colonoscopy procedures performed at our hospital in 10 years, 543 (21.2%) of the patients presented diverticular disease.

However, rectal diverticula are extremely rare. Many cases are asymptomatic and they are accidentally found. Its actual prevalence is more difficult to be defined than the prevalence of diverticular disease. In a study that analyzed 4,854 barium enemas, Walstad and Sahibzada found only four cases of rectal diverticula, which represented 0.08% of all exams[4]. Plavsic et al. conducted a similar study, which detected the prevalence of 0.07%[3]. Other series showed prevalence of 2

Table 2. *Comparative measurements of simple and complicated rectal diverticula.*

Type of diverticulum	Simple (cm)	Complicated (cm)
Ostium	2.06	3.0
Depth	2.0	5.3
Anal margin distance	6.5	8.0

Table 1. *Comparative measurements of rectal diverticula.*

Patients	Patient 1 (cm)	Patient 2 (cm)	Patient 3 (cm)	Patient 4 (cm)	Mean (cm)
Ostium	3.0	0.7	2.5	3.0	2.3
Depth	2.0	1.0	3.0	5.3	2.8
Anal margin distance	6.0	6.5	7.0	8.0	6.8

to 2.4% in patients with colonic diverticulosis[4,5]. The first study reporting rectal diverticula was published in 1911 and, since then, around 50 cases only have been described worldwide, according to recent estimates[6,7]. Inquiries were performed by the authors of this study in scientific studies from the following electronic libraries: SciELO, PubMed/MEDLINE, Biblioteca Virtual em Saúde (BVS) and Google Scholar, using the terms "diverticula", "diverticulum", "diverticulosis", "diverticulitis", "rectum", "rectal", "colorectal surgery" and "colonoscopy". Few reports on this pathology have been found in the national literature, totaling six publications in Brazil on this theme and five different patients reported from 1982 to 2010[6,8-11]. Among these studies, the series published by Martinez et al. included the largest case series, with only two cases studied thorough anorectal manometry[6]. Then, we concluded that our case series is the largest ever published nationwide.

The most affected age group ranges from 55 to 85 years old, with predominance in male patients (three times more likely to be affected)[12]. The prevalence of rectal diverticula at our endoscopy unit was 0.15% in all colonoscopy procedures and 0.74% specifically in patients with diverticular disease. The age of our patients ranged from 56 to 77 years, with no difference in prevalence in relation to gender.

Some theories have been proposed in an attempt to explain the low prevalence of rectal diverticula. The anatomical arrangement of muscular layers of the rectum, especially in the anterior and posterior walls, promoting greater resistance to variations of intraluminal pressure, is a plausible theory[13]. Lower rectal pressure and less peristaltic movements compared to sigmoid colon is another possible reason for the low prevalence in relation to other intestinal segments[7,12]. The report of a 25-day newborn with this condition suggests the importance of considering it a possible congenital etiology[14]. The similar form of the rectal diverticulum and the congenital duplication of the rectum reinforces this theory[14,15].

Rectal diverticula are usually single, but some cases have reported up to three diverticula in the same rectum[12]. In most cases, the ostium diameter of rectal diverticula is 2 cm or more, while colonic diverticula are usually smaller, of 0.5 to 1 cm[12,16]. Unlike colonic diverticula, rectal diverticulum has all layers of the rectal wall, and it is considered a true diverticulum[17]. At the endoscopic exam, rectal diverticulum is usually in the form of a large communicating ostium, present in the lateral walls of the rectum[8]. Our patients differ from this pattern, as only one patient had involvement of the lateral wall of the rectum. The mean diameter of diverticulum ostium found in our patients was 2.3 cm. Three patients presented the frequent pattern, while Patient 2 had ostium diameter of 0.7 cm, differing from the characteristics reported so far. Mean depth found in our study was 2.8 cm, while the anal margin distance was 6.8 cm. Although the measurements obtained through visual estimates in endoscopic exams are not the gold standard and usually underestimate the real dimensions of findings, our data were similar to measurements found through anorectal manometry in the studies conducted by Martinez et al.[6] and Gopalswamy et al.[18].

Rectal diverticula are asymptomatic in most cases, incidentally found at colonoscopy or barium enema[3-5]. They are frequently associated with diverticular disease[16]. Our four patients presented colonic diverticulosis, with involvement of the sigmoid colon in all cases. Three of our patients could had rectal diverticulum classified as an incidental finding, as the diverticular disease alone could explain all symptoms.

Rectal diverticula rarely appear as diverticulitis, infection, ulcer, perforation, fistula, prolapse or perineal mass[4]. Diverticulits occurs due to fecal impaction, trauma or other irritating agents into the diverticulum. Infection leads to the formation of abscesses if not properly treated. Perforation may occur, but it is less problematic when compared to perforation of colonic diverticula, because they are located under the peritoneal reflection[4,6,16,19]. Both infection and perforation may cause a fistula[4]. The patients may also develop ulceration in diverticulum secondary to acid secretions due to ectopic gastric mucosa, an extremely rare condition[15,20]. Abnormally large diverticula may prolapse through the anus or produce perineal mass that expands during evacuations[9,21]. In this series, we found one complicated rectal diverticulum with severe diverticulitis. This diverticulum was larger than simple diverticula (Table 2), and the possible explanation for the development of diverticulitis was the presence of a fecaloma inside, which started a local inflammatory process. This patient also had recurrent pollaki-

uria, caused by bladder compression, as observed in the ultrasound exam.

Some factors, such as obesity, constipation and fecaloma, are associated with the presence of rectal diverticula, probably because these conditions may increase the rectal pressure. However, Martinez et al. analyzed patients with rectal diverticula through anorectal manometry and did not find alteration to the normal pattern of sphincter pressure, rectal sensitivity or complacency[6]. The absence of supporting structures such as coccyx and the occurrence of rectal infection or trauma, hemorrhoidal disease, muscle atrophy or genetic disorders are also considered risk factors for the occurrence of rectal diverticulum[4,13,19]. Despite the frequent association with colonic diverticulosis, there is no evidence of direct relation, due to different prevalence and anatomical characteristics of diverticula[12]. In our study, we observed the presence of the following associated conditions: obesity, smoking, systemic arterial hypertension, diabetes mellitus, hypothyroidism, hemorrhoid, Chagas disease and anorectal surgery. All patients presented diverticular disease.

Rectal diverticula usually do not require surgery, as most cases are asymptomatic. Regular monitoring is recommended due to the possibility of metaplastic alteration and subsequent occurrence of mucosal malignancy[4,7,22].

Surgical interventions are reserved for symptomatic diverticulum or diverticular complications. The approach is dependent on the disease severity or extension, ranging from local draining, diverticular invagination, diverticulectomy, bypass colostomy, rectosigmoidectomy or even abdominoperineal amputation[7,19]. One of our patients was submitted to diverticulectomy due to frequent episodes of diverticulitis and local pain. The surgery produced effective results and, 2 years after that, the patient remained asymptomatic.

CONCLUSION

Rectal diverticulum is a rare condition, usually incidentally found at colonoscopy and associated with colonic diverticulosis. However, its rarity and specific colonoscopic characteristics make it important to place it as a unique entity, different from the diverticular disease. Asymptomatic in most cases, it rarely needs intervention. Surgery is reserved for symptomatic and complicated cases.

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