
Sigmoid Stricture of Complicated Diverticulitis: Case Report and Review of the Literature

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Abstract

Sigmoid stricture secondary to repeated episodes of complicated diverticulitis has an incidence of 0.09%. Our patient is a 36-year-old Caucasian male who presented with a significant history of worsening abdominal pain for over 11 years. He was repeatedly treated with a non-operative approach that consisted of antibiotics during multiple hospital admissions. A sigmoidoscopy was attempted by his gastroenterologist, but the scope was unable to pass the sigmoid, increasing the concern for stricture and potential large bowel obstruction. After a complete course of antibiotics, he was referred to our surgical team. Confirmation with an abdominal computed tomography (CT) scan showed that the inflammatory mucosa had subsided. A colonoscopy was then conducted by the surgical team and biopsies were obtained. A one-stage laparoscopic sigmoid resection with colorectal anastomosis was performed.

Keywords: Diverticulitis; Diverticulosis; Sigmoid stricture; Case report

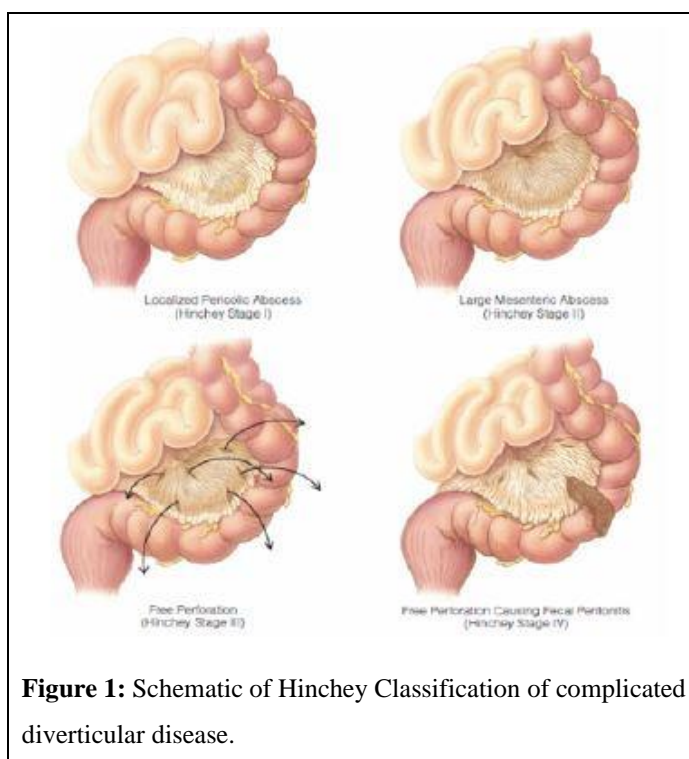
Introduction

Diverticulosis is defined as the formation of numerous sac-like structures (diverticula) that develop at the vasa recta [1]. The incidence of diverticulosis in individuals over 80-years-old is up to 65-75% and only 5% in those under 40-years of age. From 1998 to 2005, there was a 73% increase in rates of hospital admissions of individuals aged 18 to 44-years, while there was only a 29% increase in individuals 45 to 75-years [2]. Young adults with diverticular disease are more often male and, historically, have a more virulent disease process and develop more serious complications [3]. A complication of diverticulosis is diverticulitis, which is defined as inflammation and/or infection of the diverticula [4]. Approximately 10% to 25% of individuals with diverticulosis will develop diverticulitis; this percentage increases with age [5]. In addition, sigmoid stricture secondary to repeated episodes of complicated diverticulitis has an incidence of 0.09% [6].

Diverticulitis can be subclassified into acute, chronic, uncomplicated, complicated, and involving the right and/or left colon. Acute diverticulitis is diagnosed with CT along with clinical findings and is defined as inflammation/stranding around the colon with or without perforation. Chronic diverticulitis is diagnosed when there are repeated or prolonged attacks of diverticulitis. Furthermore, acute and chronic diverticulitis can be classified as uncomplicated or complicated diverticulitis. Uncomplicated diverticulitis is diverticulitis that is localized to one segment of the colon, without other complications [1]. It is treated with antibiotics and non-operative management. On the contrary, complicated diverticulitis involves the association of a diverticular abscess, fistula, bowel obstruction, perforation, or stricture [6]. The severity of complicated diverticulitis is categorized using clinical and/or radiographic findings and their associated Hinchey Classifications (Table 1 and Figure 1).

Table 1: Hinchey Classification of complicated diverticular disease.

Stage 1	Diverticulitis associated with pericolic absces: Phlegmon
Stage 2	Diverticulitis associated with pelvic, retroperitoneal, or intraabdominal absces
Stage 3	Diverticulitis associated with generalized purulent peritonitis
Stage 4	Diverticulitis associated with fecal peritonitis



The pathophysiology of colonic stricture secondary to diverticulitis has numerous modalities; one of which is muscular thickening. According to the ASCRS Manual of Colon and Rectal Surgery, a combination of poor diet, aging, and constipation leads to the inability of the colonic smooth muscle to relax, causing functional obstruction and eventual hypertrophy [3]. Both the circular and longitudinal muscle walls are thickened resulting in a smaller lumen and a shortening of the sigmoid colon. The reduced size of the lumen may further increase the pressure on the walls of the sigmoid colon, leading to additional diverticula formation.

Regarding complicated diverticulitis, treatment foundations are either nonoperative or operative. It is customary to treat Hinchey stage 1 and 2 with non-operative management and Hinchey stage 3 and 4 with operative modalities. First, non-operative management begins with lifestyle modifications, including, but not limited to dietary restrictions, alcohol and smoking cessation, and increasing the amount of daily intake of fiber. If hospital admission is required, bowel rest is recommended with a low residue or clear liquid diet during the acute illness, along with appropriate antibiotics covering aerobic, anaerobic, and gram-negative bacteria. The second option is operative management; options include resection with proximal colostomy and over-sewing of the rectal remnant (Hartmann Procedure), mucous fistula (Mikulicz operation), simple diversion with drainage of the affected segment, diversion with over-sewing of the perforation site, laparoscopic lavage without resection, a subtotal colectomy, or a primary resection with anastomosis (open vs. minimally invasive approach) [7].

The purpose of this case study is to do a review of the literature, as well as review the sequential management approach in a young patient with complicated, chronic, left sided diverticulitis who required surgical intervention.

Case Presentation

Our patient is a 36-year-old Caucasian male with a history of chronic, complicated diverticulitis with abscess and eventual stricture formation. 15 weeks prior to operative management, the patient was admitted to the emergency department with sudden onset abdominal pain, nausea and vomiting. 8 weeks later, the patient underwent a sigmoidoscopy by his gastroenterologist, in which the scope was unable to be passed through the area of stricture. This increased the suspicion of malignancy, sigmoid stricture, and potentially, a large bowel obstruction. 4 weeks afterward, the patient underwent another CT scan, revealing evidence of a significant sigmoid stricture and potential sigmoid mass, as well as resolution of inflammation secondary to a diverticulitis attack (Figure 2 and 3).

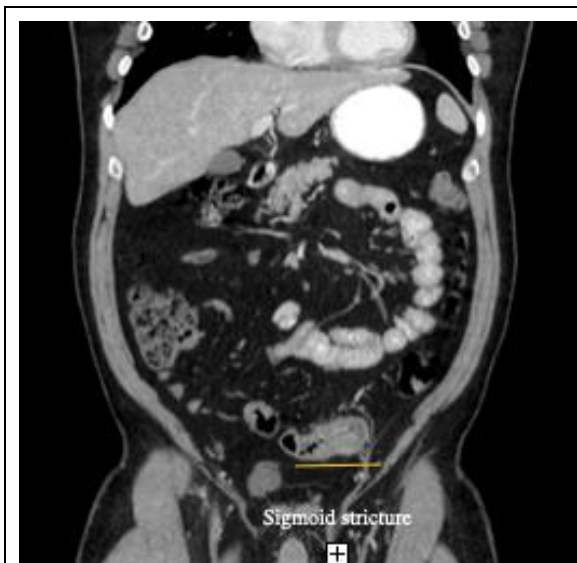


Figure 2: Abdominal CT showing stricture in sigmoid colon.



Figure 3: Abdominal CT showing stricture in sigmoid colon.

2 weeks later, a complete colonoscopy was performed by the surgeon. Biopsies of the sigmoid colon were taken, and a sigmoid stricture was visualized. In addition, a tattoo was placed at the distal portion of the stricture in order to be identified intraoperatively (Figure 4 and 5). The colonoscopy pathology resulted in the finding of normal colonic tissue. After detailed discussions with the patient, a laparoscopic sigmoidectomy with primary anastomosis was considered to be the best therapy for symptom resolution and cure.



Figure 4: Colonoscopy showing colonic tattoo.



Figure 5: Colonoscopy showing inflamed mucosa and diverticulitis.

The colon was prepped using oral antibiotics (Neomycin and Metronidazole) and mechanical preparation. The patient received 5000 units of subcutaneous Heparin preoperatively. The patient was then put in lithotomy position and lighted infrared ureteral stents were placed (Figure 6).

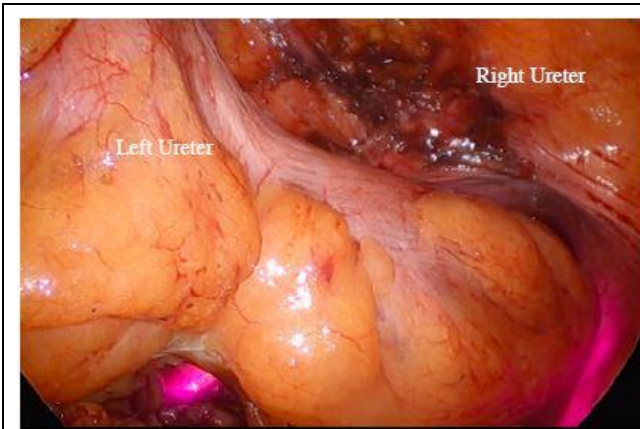


Figure 6: Left and Right lighted infrared ureteral stents.

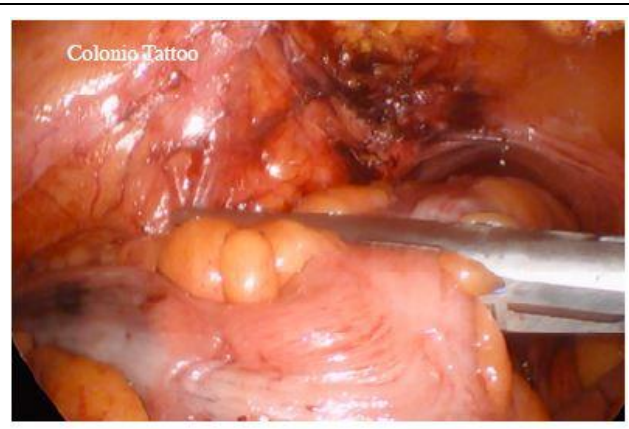


Figure 7: Area of transection.

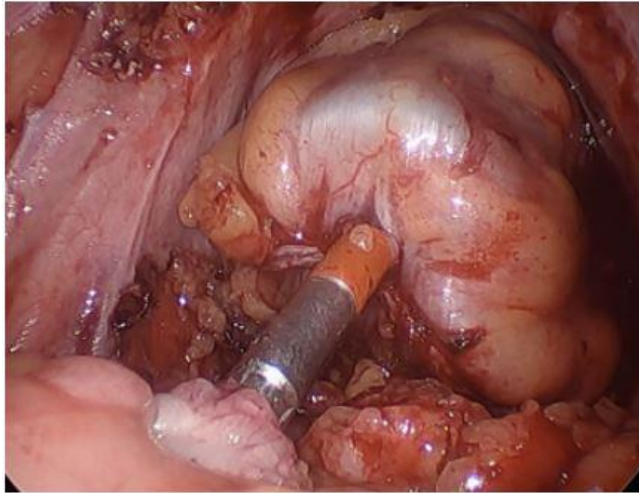


Figure 8: Circular 29 EEA.



Figure 9: Opened pathological specimen showing distal tattoo and stricture in the sigmoid colon.

Laparoscopic mobilization of the sigmoid colon was achieved, along with laparoscopic mobilization of the splenic flexure. At the level of the upper rectum, distal transection of the specimen was performed using the linear stapler (Figure 7). The specimen was then exteriorized, and the linear stapler was used to transect the proximal colon. A circular 29 End-to-End Anastomosis (EEA) was then completed, and the use of rigid proctoscopy confirmed no evidence of intraoperative leak (Figure 8).

While still in the operating room, pathology was consulted. The specimen was then opened, revealing significant strictures, causing almost complete bowel obstruction and an intraluminal sigmoid abscess (Figure 9). Postoperatively, the patient was transferred to the medical-surgical floor and started on a clear liquid diet. 4 days after admission, the patient's bowel function returned without complications, and he was discharged home.

Final pathology confirmed no malignancy; however, there was significant sigmoid stricture and an intraluminal abscess.

Discussion

Complicated sigmoid diverticulitis has been historically classified as diverticulitis of the sigmoid colon that presents as perforation, large bowel obstruction, stricture, abscess formation, and bleeding. As the case described above, the chronic multiple episodes of acute diverticulitis in a young person subsequently caused a significant colonic stricture at the level of the sigmoid colon. The percentage of any stricture after multiple complicated diverticulitis 0.09% [6].

Although surgical intervention should be offered to patients with repetitive episodes of acute sigmoid diverticulitis, surgery should be avoided in patients with uncomplicated diverticulitis. Early diagnosis, surgical evaluation, and subsequent surgical management of complicated diverticulitis in young adults with repetitive episodes should be offered. Furthermore, surgery should be performed in early stages of the disease in an effort to avoid complications including, but not limited to, stricture formation, large bowel obstruction, or free perforation that may result in a two-stage operation Hartmann's procedure or other operation.

It is well known that a complete colonoscopy is needed before surgical resection to determine and visualize any further concerns of malignancy. In order to perform a colonoscopy, the resolution of acute inflammation should be confirmed with a radiology study, such as a CT scan [7].

The Hartmann's Procedures are complicated operations and about 46% of those patients will require permanent colostomy [8]. It's important to offer surgical intervention with one-stage colorectal anastomosis to avoid having a colostomy. In addition, laparoscopic surgery is safe and should be attempted whenever possible. Utilizing the ERAS protocol, postoperative restoration of diet has been proven to be safe; the results were confirmed in this case as well. Lastly, early return of bowel function and decreased length of stay in the hospital have been proven to be beneficial.

Conclusion

An indication for sigmoidectomy or other surgical intervention associated with complicated diverticulosis occurs on an individualized, case-by-case basis. Our case depicts a limitation to this procedural progression. Our patient underwent multiple hospitalizations for complicated diverticulitis and was never provided a surgical consultation until a stricture developed; rather, he was treated with antibiotics and observation. His medical trajectory put him at risk for antibiotic resistance, stricture induced bowel obstruction, and colonic perforation necessitating a colostomy, among other medical complications. Further consideration for surgical consultation should be studied and implemented to reduce these risks in younger patients who develop complicated diverticulosis or undergo numerous hospitalizations.

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