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## Case report of a giant colonic sigmoid diverticulum causing sigmoid volvulus



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## ABSTRACT

**INTRODUCTION:** Giant colonic diverticulum is a rare complication of colonic diverticulosis that occurs when a single diverticulum enlarges to over 4 cm in diameter. There have been fewer than 200 cases reported worldwide since it was first described in 1946.

**PRESENTATION OF CASE:** The author presents a rare case of a giant colonic diverticulum that presented as a sigmoid volvulus. The patient underwent emergency surgery with resection of the diverticulum and reduction of the volvulus.

**DISCUSSION:** Due to their propensity to cause complications and mechanical blockage from their large size, all authors recommend surgical resection of giant colonic diverticula. This has been documented to be safely done by diverticulectomy as was performed in this patient, but also by segmental colectomy, laparoscopic diverticulectomy, or laparoscopic colectomy.

**CONCLUSION:** Giant colonic diverticulum is a rare entity that tends to cause many intra-abdominal complications, including volvulus. Surgical resection is recommended once identified.

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## 1. Introduction

Giant colonic diverticulum (GCD) is a rare complication of diverticulosis in which a single diverticulum reaches 4 cm or greater in diameter, but most do not cause symptoms or lead to patient presentation to a physician until they reach 7 cm or larger [1]. Patients usually present with symptoms of abdominal pain, distension, bowel obstruction due to adhesions, or bleeding [1–3]. Due to the high incidence of complications associated with GCD, surgical resection is recommended [3,4].

## 2. Case report

A 72 year old male presented to the emergency department with complaints of abdominal distension, nausea with vomiting, and inability to have a bowel movement for seven days. On physical examination, his abdomen was very distended and tender to palpation without peritoneal signs. A computed tomographic scan of the abdomen was obtained which showed a 10 cm air filled central structure that originated from the sigmoid colon (Fig. 1). In addition to this, the proximal colon was dilated and stool-filled, while the distal sigmoid colon and rectum were decompressed and empty. Because the patient had a complete colonic obstruction, he was taken to surgery for exploration.

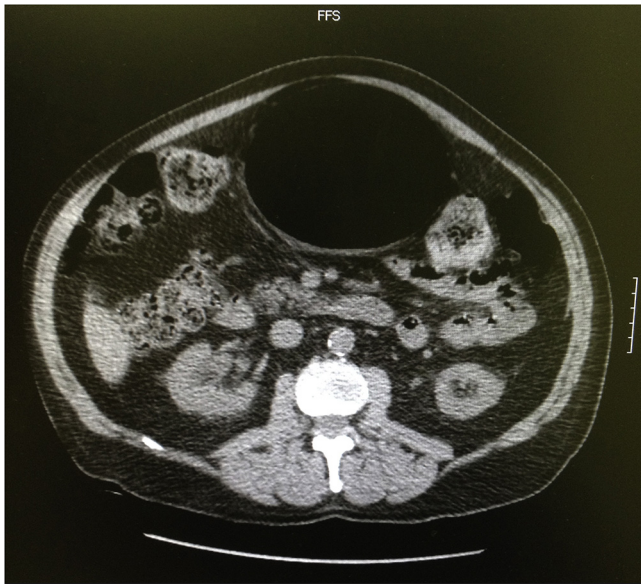
In the operating theater, a giant colonic diverticulum was found that originated from the sigmoid colon but had migrated under the transverse colon (Fig. 2). In addition, the sigmoid colon proximal and immediately distal to the mouth of the diverticulum had twisted around the base and formed a volvulus which was causing a complete obstruction of the colon. The GCD was freed from dense adhesions to the surrounding mesentery and the sigmoid colon was untwisted, relieving the volvulus. Since the patient's colon was not prepped prior to surgery, the diverticulum was stapled off the colon at its origin from the sigmoid, but no bowel resection was performed. The patient recovered and was discharged from the hospital after five days. He returned to clinic several weeks later and was doing well with no complications.

## 3. Discussion

This work has been reported in line with the SCARE criteria [5]. There have been approximately 190 cases of GCD published in the English language literature since it was first described in 1946, with sizes ranging from 4 to 40 cm [6,7]. GCD has been documented to cause a myriad of complications from intussusception to sequestering endoscopy capsules, but the author could find only one other case of documented volvulus due to GCD, and that reference is from 1961 and not something most surgeons are familiar with today [8]. This case report documents not only a second and contemporary occurrence of sigmoid volvulus due to GCD, but also the need for surgical resection when a GCD is identified. Due to their propensity to cause complications and mechanical blockage

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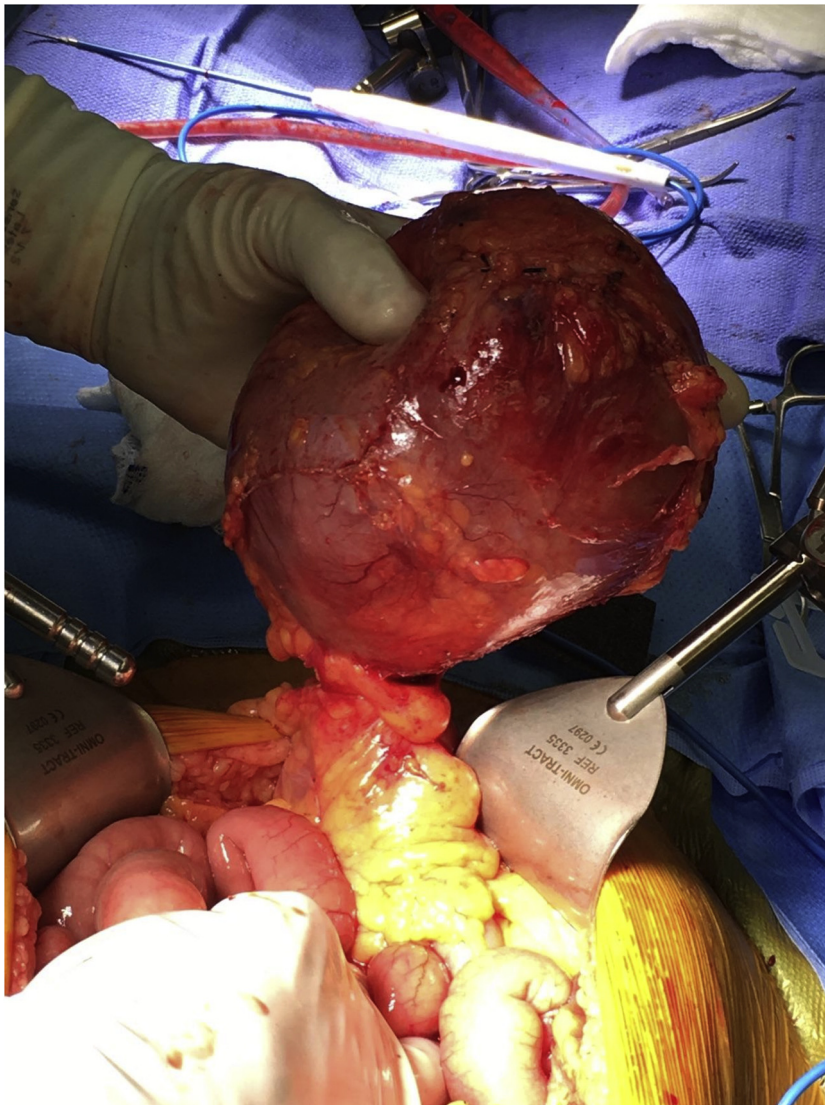
E-mail address: [heartandbones@yahoo.com](mailto:heartandbones@yahoo.com)



**Fig. 1.** CT scan of the abdomen showing a large air-filled diverticulum coming off the sigmoid colon.

from their large size, all authors recommend surgical resection. This has been documented to be safely done by diverticulectomy as was performed in this patient, but also by segmental colectomy, laparoscopic diverticulectomy, or laparoscopic colectomy [3,7,9]. This case report also documents the safety of performing diverticulectomy alone, without segmental colectomy, since there have been no reports the author could find which show recurrence of GCD after diverticulectomy, and our patient did not suffer any recurrence during follow-up. In addition, diverticulectomy can be safely performed without a bowel preparation, which is important since most patients present with a complication and need urgent surgery.

McNutt originally divided giant colonic diverticula into three distinct entities [10]. Type 1 is a pseudodiverticulum with an out-pouching of mucosa and submucosa that protrudes through a defect in the colonic wall where the vasa recta penetrate along the mesenteric border. Type 2 is not a diverticulum at all, but a walled-off abscess cavity due to perforation of a diverticulum and lined with fibrous scar tissue that enlarges to giant size. And type 3 is a true diverticulum that possesses all layers of the colonic wall. Ten years later, Choong and Frizelle suggested a new and simpler classification system with only two types: type 1 is a pseudodiverticulum whose wall is composed of fibrous tissue without a muscular layer,



**Fig. 2.** Intra-operative photo showing the dissected diverticulum and its small fibrous channel to the sigmoid colon.

and type 2 is a true diverticulum with all layers of the colonic wall [11]. The pathology report in this case revealed the diverticulum to be a type 1.

Although the exact pathophysiology that causes these diverticuli to grow to such large sizes is unknown, the most commonly accepted theory is that the fibrous neck above the opening of the diverticulum acts as a one-way valve which allows air entry but not exit [6,11]. The patient in this report had a large diverticulum off the sigmoid colon and the presence of a few additional diverticuli along the sigmoid colon as well. However, the sigmoid itself was relatively healthy and was not fibrotic, woody, or strictured. For this reason, it could be left in situ. Other authors have described GCD occurring without additional diverticuli present, but most often there are additional diverticuli along the same segment of colon in 71–85% of the cases [1,3,7].

In conclusion, GCD is a rare entity that tends to cause many intra-abdominal complications, including volvulus, and therefore all GCD should be resected once identified on imaging studies. Diverticulectomy is a safe option to treat this disease in the patient requiring urgent surgery, even without a prior bowel preparation. Surgical resection is recommended once a GCD is identified.

#### Conflicts of interest

No conflicts of interest.

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#### Ethical approval

Institutional review board waived need for approval for case reports. All patient identifiers have been deleted.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contribution

The single author performed all the work on this manuscript.

#### Registration of research studies

Not applicable to case reports.

#### Guarantor

John Alfred Carr, MD, FCCP, FACS.

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