






Giant Colonic Diverticulitis, an Extremely Rare Presentation of a Rare Disease – Clinical Presentation and Literature Review

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Abstract

Introduction Giant colonic diverticulum (GCD) is rare phenomenon, with less than 200 cases described in the literature. One of the complications of GCD is diverticulitis. To date, there is paucity of data addressing the diagnosis and management of GCD complicated by acute diverticulitis.

Objective To better understand the diagnostic tools, the initial management, and the long-term follow-up for this group of patients as well as to recommend a proper multidisciplinary approach to this infrequent disease.

Method A systematic literature search was performed using the PubMed, Embase, and Cochrane databases to identify all the published studies on GCD complicated by diverticulitis. Two of the authors assessed the relevance of the included full-text papers. The articles were assessed independently.

Results In total, 12 cases were identified. Our results show that 10/11 (91%) of the patients who had computed tomography (CT) scans during the initial evaluation had a correct diagnosis. There was no case of failure to non-operative approach (7/7). The patients who had an emergency operation were treated so due to diffuse peritonitis (two patients), acute hemorrhage arising from ulcers within the diverticula (one patient), and misdiagnosis (one patient).

Conclusion Giant colonic diverticulitis is a very rare disease. Computed tomography scan is a valuable tool for the initial diagnosis as well as for treatment strategy planning. Non-operative management is a viable option for patients without diffuse peritonitis. Interval endoscopy is recommended if no contraindication exists.

Keywords

- ▶ giant colonic diverticulum
- ▶ giant colonic diverticulitis
- ▶ colon cancer

Introduction

Diverticular disease can be found in a significant portion of the population, affecting approximately a third of the adult

population. It is estimated that in the United States alone, diverticular disease complications, such as acute diverticulitis, bowel perforation, abscess, fistula, or hemorrhage are responsible for almost 300,000 hospitalizations per year.¹

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Giant colonic diverticulum (GCD), which is characterized by a diverticulum with 4 cm or more in length,² is a very rare entity, first described in 1946 by Bonvin and Bonte.³ To date, fewer than 200 cases of GCD have been published.^{4,5}

Three types of GCD have been described⁶⁻⁹;

1. *Inflammatory diverticulum* – composed of scar tissue and arising from perforation and abscess formation (66% of cases)
2. *Pseudo diverticulum* – composed of muscularis mucosa alone (22% of cases). A proposed mechanism is the *ball-valve*, which traps colonic gas inside the sigmoid diverticulum causing it to gradually enlarge.¹⁰
3. *True diverticulum* arising from all muscular layers and myenteric plexus (12% of cases). This type is presumed to be due to an intestinal duplication.

Approximately 2% of patients with GCD will have a synchronous malignancy, either within the diverticulum or distal to it.¹¹

As with other types of colonic diverticulum, GCD can be complicated with acute diverticulitis; this extremely exceptional situation has hardly been described, hence the paucity of knowledge on the presentation and treatment of such a rare disease.

We aimed to perform a literature review of all cases of GCD complicated with acute diverticulitis and to try to describe the clinical presentation, diagnostic tools, and treatment options for this disease.

Material and Methods

A systematic literature search was performed using the PubMed, Embase, and Cochrane databases to identify all the published studies on GCD complicated with acute diverticulitis. We used the following search terms: *giant colonic diverticulum*; *giant colonic diverticulitis*, *giant sigmoid diverticulitis*.

Two of the authors assessed the relevance of the included full-text papers. The articles were assessed independently, and any differences were discussed between the authors to arrive at a consensus within each review pair.

In cases of unclear or missing information, the authors of the case reports were contacted via email, and clarifications were sought.

Results

We combined all abstracts found in our search into a single list, consisting of 348 studies. After duplication control, a total of 145 studies were further evaluated (►Fig. 1) as described earlier. Overall, 11 relevant case reports were found and included in this review.^{6,12-21} We also included unpublished data collected from one patient who presented with GCD complicated with acute diverticulitis at our medical center. Results are outlined in ►Tables 1–4.

Clinical Presentation

A 72-year-old male presented to the emergency room with 2 days of left lower quadrant abdominal pain, elevated body

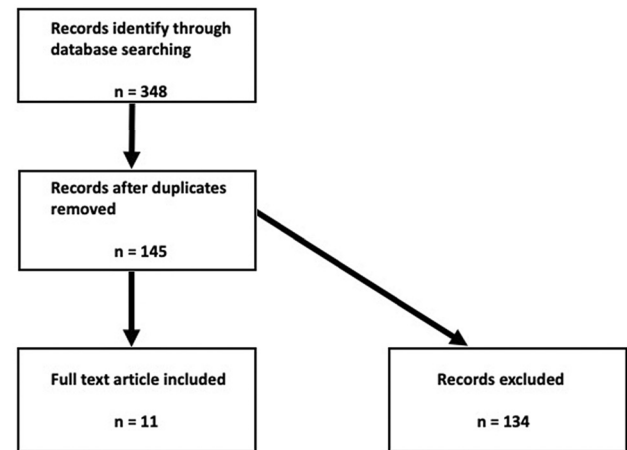


Fig. 1 PRISMA flow diagram of included studies.

temperature, and anorexia. Upon arrival to the hospital emergency room, he appeared pale and sweaty. His vital signs showed slight tachycardia (105 BPM), and a fever of 38.2°C. Physical examination revealed a tender abdomen with signs of diffused peritonitis, and laboratories showed notably elevated white blood cell (WBC) count (29,770 K \micl). An abdominal computed tomography (CT) scan was ordered, and imaging demonstrated a GCD complicated with acute diverticulitis and signs of perforation.

Following the diagnosis of perforated GCD, we began treatment with antibiotics and fluids, and the patient was referred to an emergency laparotomy. Surgery subsequently confirmed the diagnosis of perforated GCD with purulent peritonitis. We decided to perform a sigmoidectomy with a descending colon end colostomy (Hartman procedure). The

Table 1 Symptoms of giant colonic diverticulitis n (%)

Symptom	Patients (n = 12)
Abdominal pain	12 (100%)
Constipation	1 (8%)
Abdominal mass	1 (8%)
Rectal bleeding/melena	1 (8%)
Anorexia	1 (8%)

* Each patient may present with one or more symptoms.

Table 2 Signs of giant colonic diverticulitis n (%)

Physical signs	Patients (n = 12)
Abdominal palpable mass	3 (25%)
Elevated body temperature	4 (33%)
Abdominal tenderness	4 (33%)
Septic shock	1 (8%)
Disseminated peritonitis	5 (42%)
Abdominal distension	2 (17%)
Hematochezia	1 (8%)

* Each patient may present with one or more signs.

Table 3 Computed tomography scan finding (%)

Finding	Patients (n = 11)
Perforation of sigmoid colon	1 (9%)
Giant diverticulitis	9 (82%)
Sigmoid volvulus	1 (9%)

patient recuperated well after surgery and was discharged home on postoperative day 7. The pathological report showed acute diverticulitis with chronic inflammatory changes.

Demographic, Presentation, and Diagnosis

As previously mentioned, 12 cases were included in this review; 6 male and 6 female patients. The median age was 71, with a wide range of 17 to 88 years old.

All 12 patients included in this review presented with acute abdominal pain. Four patients (33%) had other complaints, such as bowel habit changes ($n = 2$), anorexia ($n = 1$), and abdominal mass ($n = 1$). Upon clinical examination on presentation, 9 patients (75%) had abdominal tenderness (with or without peritonitis), 4 (33%) had a high fever, and in 3 patients (25%), an abdominal mass was palpated. The WBC count was elevated in all cases for which the information was available (6/6).

All but one had abdominal CT scans during the initial evaluation. Ten out of the 11 patients who underwent CT scans had their GCD diagnosed correctly on presentation. One patient was initially diagnosed with sigmoid volvulus and was referred to sigmoidoscopy for decompression of the bowel, which eventually revealed a perforated GCD complicated with diverticulitis. One patient had ultrasonography (US) imaging alone and was initially diagnosed with a large ovarian cyst; the diagnosis of GCD was eventually made during an explorative laparotomy.

Treatment

Seven patients (58%) were initially treated non-operatively with intravenous antibiotics. There was one treatment failure in this group, and the patient was further treated successfully with an invasive radiology intervention with balloon angioplasty of the diverticular neck alongside diverticular external drainage.

One patient was eventually operated on and underwent an interval laparoscopic sigmoidectomy with primary anastomosis without complications.

Overall, 5 patients (42%) were operated on during the index hospitalization. Three patients were referred to an emergency operation after the initial diagnosis. The reasons for emergency surgery were: diffused peritonitis with imaging signs of perforation (2 patients) and acute hemorrhage arising from ulceration within the giant diverticula (1 patient). Both patients underwent Hartman procedure, and the third patient had sigmoidectomy with primary anastomoses.

As mentioned earlier, two patients who were initially diagnosed with other findings were operated on and eventu-

Table 4 Treatment of giant colonic diverticulitis n (%)

Treatment	Patients (n = 12)
Non-operative treatment	7 (58%)
Percutaneous CT guided drainage	1 (15%)
Interval sigmoidectomy	1 (15%)
Operative treatment	5 (42%)
Hartman procedure	3/5 (60%)
Sigmoidectomy and primary anastomosis	2/5 (40%)

ally diagnosed with GCD. The first patient was referred to an urgent sigmoidoscopy for decompression of sigmoid volvulus, a GCD was diagnosed, and due to suspected perforation, an urgent operation was performed. This patient also underwent sigmoidectomy and end colostomy (Hartman procedure). The second patient is the youngest patient of this series, aged 17, and he was diagnosed with a giant ovarian cyst on ultrasound (US) alone. The patient was transferred urgently to the operating room for an explorative laparotomy. The diagnosis of GCD was made during surgery, and the patient underwent sigmoidectomy with primary anastomosis.

Discussion

In this manuscript, we aimed to describe the accumulated data on giant colonic diverticula complicated with acute diverticulitis. As it may be expected, we were not able to identify a specific group with higher risk for this disease; the male to female ratio was 1:1, the age range included patients from 17 to 88 year of age, and the presentation was not always straight-forward. The treatment for this disease varied significantly, partially due to misdiagnosis and partially due to the range of the disease severity.

The Role of CT for Initial Diagnosis

The EAES and SAGES 2018 consensus conference on acute diverticulitis management²² strongly recommends the use of CT scan as a diagnostic tool when acute diverticulitis is suspected, which goes hand in hand with our findings in this series.

The usage of CT scans in our group of patients has multiple purposes:

- The initial diagnosis of GCD complicated with diverticulitis.
- To detect complications of acute diverticulitis, such as perforation, abscess, and fistulas.
- Computed tomography scan can demonstrate GCD size, location, wall thickness, and its relationship with the surrounding structures. All this information gives the clinicians valuable tools when planning the best treatment strategy for each specific patient.

Zeina et al.^{23,24} addressed GCD diagnosis specifically. In their article, they showed that a CT scan with intravenous

contrast material can address all the needed information, as described above. They emphasize the advantages of coronal and Sagittal multiplanar reformatted images, especially when considering that one of the imaging goals is identifying the neck of the GCD, which connects the diverticular cavity with the adjacent colon. This information can prove to be essential for correct diagnosis as well as for accurate and informed treatment strategy planning.

Treatment of Acute Giant Colonic Diverticulitis

It is well-established^{22,25-28} that non-complicated diverticulitis, as well as complicated diverticulitis without diffuse peritonitis, should be managed non-operatively.

In our case series, one patient treated non-operatively did not respond well to this method. The patients who were treated surgically were those who were misdiagnosed – probably due to lack of axial imaging usage in the initial valuation (1 patient, [8%]), had diffuse peritonitis (2 patients [17%]), or had acute bleeding from ulceration within the giant diverticula coupled with acute diverticulitis (1 patient [8%]).

Considering this, we propose that non-operative treatment in this setting is a safe and feasible method, when coupled with in-hospital close follow-up.

Follow-up for Patients Treated with a Non-operative Approach

Although many clinicians recommend elective colonoscopy 1 to 2 months after the resolution of acute diverticulitis, the literature is not clear about its benefit.²⁹⁻³³ We do know that 2% of patients diagnosed with GCD will found to have synchronous tumors within the diverticula or distal to it.¹¹ In light of this, we suggest that an interval endoscopy should be discussed, considering the patient's medical and general condition.

This article and its outlined recommendation should be considered in the context of our limitations. The existence of GCD is rare, with less than 200 cases reported worldwide. Out of this rare phenomenon, the incidence of acute GCD complicated by acute diverticulitis is even rarer. This fact gravely impairs our ability to state strong, evidence-based guidelines for the evaluation, initial treatment, and follow-up of this specific group. We did attempt to objectively describe the published data and to carefully use it as an aiding tool for clinicians.

Conclusion

Giant colonic diverticulitis is a very rare disease, and its presentation can be deceiving. Computed tomography scan is a valuable tool for initial diagnosis as well as for treatment strategy planning. Non-operative management is a viable option for patients without diffuse peritonitis. Interval endoscopy should be considered.

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None.

Conflict of Interests

The authors have no conflict of interests to declare.

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