Surg. Gastroenterol. Oncol. 2022;27(3):231-233 DOI: 10.21614/sgo-486

How Fast Can a Giant Colonic Diverticulum Grow?

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ABSTRACT

Background: A giant colonic diverticulum is defined as a diverticulum with a diameter over 4 cm. Previous case reports have focused on and investigated the pathophysiology, but little is known about the growth pattern.
Methods: We present a case in which we retrospectively document the growth rate of a giant colonic diverticulum (GCD).
Results: A 67-year-old patient was sent to our surgical department with a CT confirmed cystic, air-filled cavity of more than 7 cm. Segmental resection of the megadiverticulum was performed. The pathology showed a giant colonic diverticulum that measured 10x8x7 cm. We compared the CT images from his previous attack of diverticulitis with the actual findings: a single enlargened diverticulum had grown nearly sevenfold since this attack, implying a growth rate of 1,5 cm/month.
Conclusion: Our case report supports the hypothesis that a previous diverticulitis attack and early colonoscopy can accelerate the development of a colonic megadiverticulum, and they are possible risk factors.
Key words: acute diverticulitis, colonic diverticulosis, giant diverticulum, growth rate

INTRODUCTION

According to the McNutt pathologic classification, a giant colonic diverticulum is defined as a diverticulum with a diameter over 4 cm. (1) Previous case reports have focused on and investigated the pathophysiology, but little is known about the growth pattern. We present a case in which we retrospectively document the growth rate of a giant colonic diverticulum (GCD).

CASE REPORT

A 67-year-old patient was sent to our surgical department with abdominal pain in the left hypogastrium. On admission, an abdominal X-ray revealed a classic cystic radiolucent formation. On the previous colonoscopy, left-sided colonic diverticulosis was displayed with congestive fibrotic tissue in the lateral

Received: 16.06.2022
Accepted: 20.08.2022

part of the sigmoid colon. Abdominal ultrasound detected a palpable but mobile hyperechogenic structure in the left lower quadrant, with a diameter up to 70 mm and free fluid in the surrounding area. The patient revealed that six months ago, he had an episode of acute diverticulitis; since then, a slowly growing palpable mass appeared in the left lower quadrant of his abdomen. Abdominal computed tomography (CT) scan confirmed the finding of a large, smooth-walled, air-filled cavity of more than 7 cm. We obtained the CT images from his previous attack of acute diverticulitis and compared the images. The axial CT scans showed a single enlargened diverticulum with a diameter of 13 mm (*fig. 1*). There was a suspicion that this diverticulum had enlarged its volume nearly sevenfold since this attack. A giant diverticulum of the sigmoid colon was confirmed during elective operation, finding a large thin-walled cystic structure (*fig. 2*). The surface was fine glossy, with a smooth inner lining and filled with air. At exploratory laparotomy, segmental resection of the megadiverticulum was performed. The postoperative recovery was uneventful, and the patient was discharged on the sixth postoperative day. The pathology showed a giant colonic diverticulum that measured 10x8x7 cm, implying a growth rate of 1,5 cm/month. The histopathological examination revealed colonic mucosa as the inner layer and the obliteration of the diverticular pedicle (*fig. 3*).

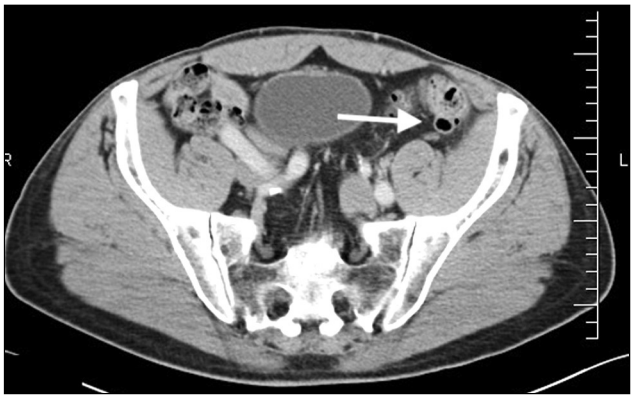

Figure 1 - Abdominal CT scan from the previous acute diverticulitis attack found a single enlargened diverticula containing air (diameter of 13 mm), intimately related to the sigmoid colon

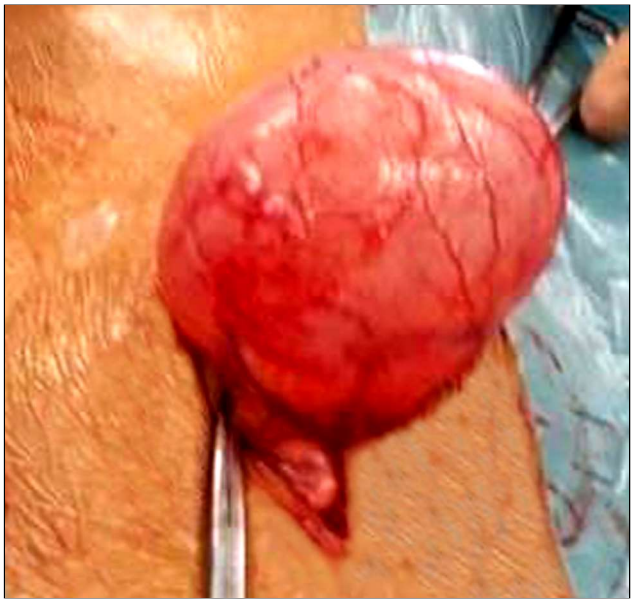

Figure 2 - Intra-operative photo showing a large air-filled sac arising from the sigmoid colon

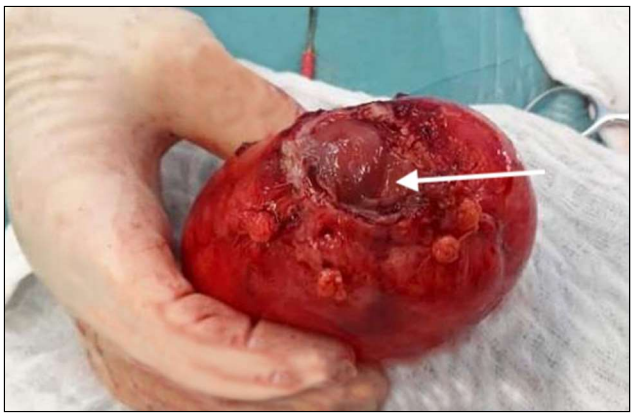

Figure 3 - Surgical specimen of the large diverticulum with obliterated diverticular pedicle

DISCUSSION

Giant colonic diverticula are rare complications of large bowel diverticulosis, with just nearly 200 cases reported in the literature. The first case was reported in 1946 by French surgeons Bonvin and Bonte (2). The pathogenesis is still not fully understood. The most relevant hypothesis assumes a unidirectional air-valve mechanism and further progressive enlargement through the diverticular neck (3). However, this communication in 40% of cases is intermittent due to the obliteration of the diverticular neck. The most prevalent location is in the sigmoid colon. McNutt described three subtypes of giant colonic diverticula (1). Type 1 or pulsion diverticula is characterized by chronic inflammation, typical granulation tissue, and slow continuous growth. On the other hand, type 2 diverticula are caused mainly by acute inflammation, where subserosal perforations lead to walled-off abscesses. Type 3 diverticula are made of the complete mucosal and muscular layer as a true congenital duplication (4).

The histomorphologic features in our case, including

chronic inflammation, are most consistent with the description of type 1 giant colonic diverticulum. Nigri and colleagues found that these diverticula are prevalent in just 22% of the reported cases (5). The clinical presentation in most patients is variable, and the diagnosis is surprising. The patient may have non-specific symptoms like chronic abdominal pain, asymptomatic abdominal mass, or functional problems like constipation and diarrhea. Even fever and gastrointestinal bleeding were presented as initial clinical symptoms (5). The diagnosis is usually made incidentally with imaging modalities, although radiographic manifestations may often be confused with abscesses (6). Radiographic signs include the lifting balloon sign characterized by migration of the diverticulum out of the left lower quadrant, creating an air-filled cystic lesion and often do not fill with contrast peroral contrast fluid (7). Giant diverticula are often not well displayed on colonoscopy as the diverticular opening can be obliterated, as it was in our current case. After continued investigation on plain abdominal X-ray, a classic cystic radiolucent formation can be seen (is identified). Contrast-enhanced abdominal CT scan is the next choice of imaging modalities, which shows an air- or fluid-filled cystic structure. If the neck of the diverticulum is not obliterated, the CT scan can also identify communication with the sigmoid colon (8). The preferred treatment of a giant sigmoid diverticulum is primary resection of the compromised segment of the sigmoid colon. In high-risk patients, as definitive treatment also, diverticulectomy should be considered (4). Laparoscopic and robotic surgical resection of GCD with resection of the adjacent colon are safe alternatives with potential advantages over the open approach (9,10).

CONCLUSION

There remain many unanswered questions about the optimal timing of a surgical procedure. Clinical presentation and the final size is limited by the surrounding pressure. Because GCD is usually resected after diagnosis, their growth pattern is generally unknown. In our case, the growth rate was estimated at 15 mm/month, assuming that the diverticula started to develop immediately after the last attack of diverticulitis. However, on occasion, if a prior abdominal CT scan is available for comparison, information may be obtained regarding the growth pattern. In calculating these growth rates, giant diverticula are assumed to grow linearly. Our case report supports the hypothesis that a previous diverticulitis attack can accelerate the development of a colonic megadiverticulum, and it is a possible risk factor.

Conflict of interest

The authors declare that there is no conflict of interest.

Ethical approval

There is not need for ethical approval.

Informed Consent

Written informed consent was obtained from the patient for their anonymized information to be published in this manuscript.

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