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Gas Shadow in the Abdomen - Rare Manifestation of a Common Condition

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Aims: Diverticular disease is common in the ageing population, and this trend is also seen in Asians. A rare manifestation of this condition is a giant colonic diverticulum, defined as a sac-like protrusion of the colonic wall larger than 4 cm. Here we report a case of a patient who presented with an abdominal mass causing mild discomfort who was later found to have a giant colonic diverticulum on a background of known diverticular disease.

Case Presentation: A 52-year-old lady presented with bloating and a non-tender abdominal mass three months after successful medical treatment of acute diverticulitis. CT imaging revealed a 5cm contained air pocket with minimal surrounding inflammatory fat stranding. She was diagnosed to have a GCD and underwent a laparoscopic sigmoid colectomy which confirmed a giant diverticulum of the descending colon on histopathology.

Discussion: The most common aetiology of giant colonic diverticulum is post-inflammatory subsequent to focal perforation of an existing colonic diverticulum. Surgery is recommended as a GCD is usually symptomatic and there is a higher risk of complications if it is left *in-situ*.

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Conclusion: With the rarity of this disease entity in the Asian context, a surgeon encountering giant colonic diverticulum may have limited experience in managing it. Surgery is the mainstay treatment modality and consists of resection of the giant colonic diverticulum en-bloc with the adjacent colon.

Keywords: Giant colonic diverticulum; diverticular disease.

1. INTRODUCTION

Diverticular disease is common in the ageing population with a rising incidence of up to 60 percent by 60 years of age [1]. The prevalence in Asian communities ranges between 13 and 25% [2]. Between 10-40% of patients with this condition are at risk of developing complications with significant morbidity and mortality such as obstruction, perforation, abscess formation and bleeding [3].

A rare manifestation of diverticular disease is a giant colonic diverticulum (GCD). GCD is defined as a sac-like protrusion of the colonic wall larger than 4 cm [4]. It often develops as a walled off cavity containing gas-producing bacteria that communicates intermittently with the bowel lumen, creating a ball-valve effect that results in an increase in the size of the diverticulum. Fewer than 200 cases have been reported in the literature worldwide [5,6].

This report documents the case of a 52-year-old lady presenting with bloating and a non-tender abdominal mass three months after successful medical treatment of acute diverticulitis. She was subsequently diagnosed to have a GCD of the descending colon on CT imaging.

2. CASE PRESENTATION

A 52-year old Chinese woman with a background history of well controlled hypertension complained of bloating and mild abdominal discomfort for two days' duration. She did not have any recent change in bowel habits.

Three months prior she had been admitted to hospital for 3 days for medical treatment of acute diverticulitis of the descending colon. A year earlier she had been documented to have uncomplicated pan-colonic diverticular disease on screening colonoscopy.

She was afebrile and haemodynamically stable on admission. Physical examination revealed a non-tender mass palpable in the left flank. There was no abdominal rigidity or guarding. Bowel

sounds were present, and the rest of the physical examination was unremarkable.

On CT imaging a 5 cm-contained air pocket in relation to a descending colon diverticulum was shown with minimal inflammatory fat stranding (Fig. 1). There was enlargement of the air pocket in comparison to a previous scan 3 months ago when there were small pockets of free air in the area of the inflamed descending colon diverticulum. The patient was diagnosed with post-inflammatory Type II GCD [4].

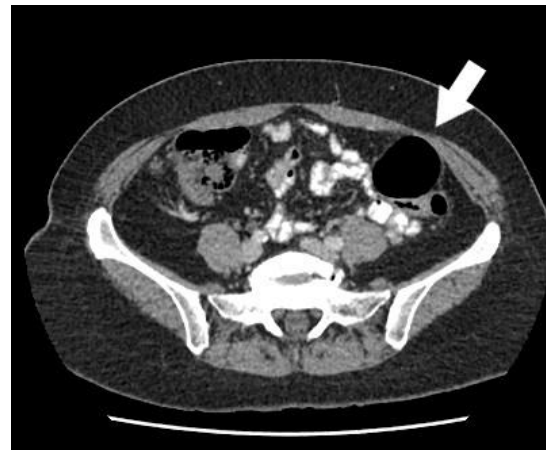


Fig. 1. CT image - white arrow points to air pocket in relation to descending colon diverticulum

2.1 Treatment

An elective sigmoid colectomy was performed laparoscopically. The GCD of the descending colon was adherent to the lateral abdominal wall and was resected en-bloc with the adjacent colon. The resected specimen is shown in Fig. 2. Histopathology revealed fibrosis with chronic inflammation and no evidence of malignancy in the GCD.

2.2 Outcome and Follow Up

The patient had an uneventful recovery and was discharged on the second postoperative day. She remained well and asymptomatic when last reviewed three months postoperatively.

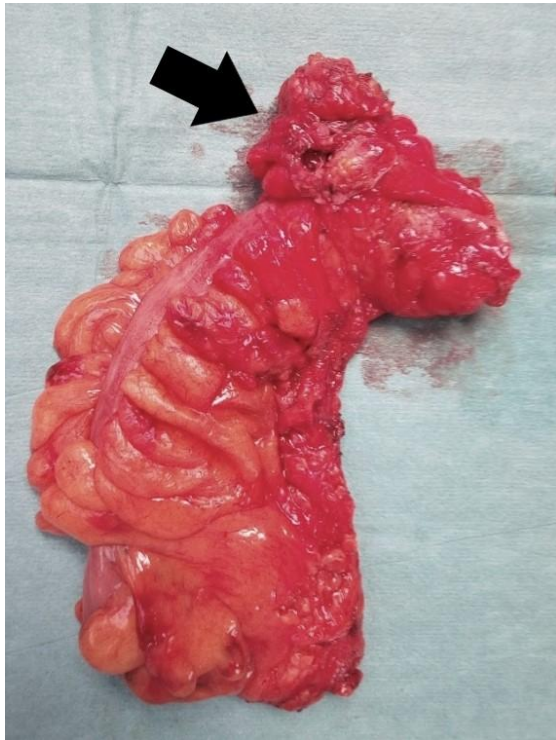


Fig. 2. Specimen image of laparoscopically resected colon - black arrow points to the diverticulum near the proximal end

3. DISCUSSION

Giant colonic diverticulum (GCD) is a rare manifestation of the fairly common colonic diverticular disease, with fewer than 200 cases in reported literature [7] and none previously described in Singapore. In a series of 2877 barium enemas in an Asian population, only 1 case (0.03%) was encountered [8].

Arising most frequently in the sigmoid colon, a giant colonic diverticulum may manifest with symptoms such as acute abdominal pain, constipation/diarrhea, nausea/vomiting, and per rectal bleeding. In a 2015 review series of 166 patients, up to 9 percent of patients presented with an acute abdomen [9]. Patients may present with either a tender or non-tender abdominal mass, associated with fever and abdominal distension. Only fewer than 5 percent may be asymptomatic.

Investigation of an abdominal mass would frequently involve an abdominal X-ray. This may indicate a large gas filled shadow in the lower abdomen [9]. On computed tomography (CT) imaging, this may comply with the appearance of a gas-filled and thin-walled structure that

communicates with the adjacent colon and does not enhance after injection of contrast [10].

On the other hand, double-contrast barium enema studies may be performed in low resource settings which may indicate a barium-filled outpouching of the colon which is joined to the colonic wall by a neck [8]. The mass could also be shown to contain an air-fluid level without any contrast within it [11]. Barium enemas are less frequently used with the advent of CT scans. In the local context, a CT imaging scan of the abdomen and pelvis is a widely performed investigation modality for abdominal masses and is the recommended examination for diagnosis of GCD, as there is a risk of perforation on Barium enema and the ostium visualised on colonoscopy may be too small to suggest a GCD.

Similar to diverticular disease, the condition is classified based on whether there is total involvement of all the layers of the colonic wall. In 1988, McNutt et al classified three distinct subtypes of GCD based on histology. Type I is a pseudo-diverticulum consisting of chronic granulating tissue interspersed with colonic mucosa without a distinct smooth muscle wall. Type II is an inflammatory GCD that has a wall only consisting of scar tissue resulting from focal perforation of the colonic wall. Type III is a true diverticulum with a wall that consists of colonic serosa, muscularis, submucosa, and mucosa [4].

The most common aetiology is post-inflammatory Type II GCD with focal perforation, which is seen in up to two-thirds of cases [9]. A subserosal perforation leads to a walled off cavity that is in intermittent communication with the bowel lumen, creating a ball-valve effect. The presence of gas-producing organisms in the cavity results in an increase in the size of the diverticulum [4].

The risk of complications if a giant colonic diverticulum is left in-situ ranges between 28%-35% [12]. The most common complication is perforation leading to peritonitis, followed by abscess formation, intestinal obstruction, volvulus and infarction [9]. The risk of adenocarcinoma transformation is 2% [12]. Diverticulectomy without colonic resection has been proposed as an alternative in the absence of concomitant colonic diverticular disease, which may occur in about 10 percent of GCD. However, in the majority of GCD, colonic resection with en-bloc resection of the diverticulum has excellent results and is the preferred surgical option [9].

4. CONCLUSION

In conclusion, giant colonic diverticulum is a rare manifestation of a common condition with rising prevalence in an ageing population. Patients may present symptomatically with an acute abdomen, or simply abdominal distension and bloating. When present, elective colonic en-bloc resection should be considered to mitigate the risk of complications including perforation and bleeding. The present case is reported with the purpose of raising awareness among the Asian surgical fraternity who may have limited experience with this condition.

CONSENT

All authors declare that written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

As per international standard or university standard written ethical permission has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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