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Case Report

Rare Case of Pneumatosis Coli following Mycotic Aneurysm excision

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Abstract

Pneumatosis coli (PC) is a rare radiological phenomenon of the presence of gas in the wall of the large intestine. It carries a large burden of morbidity and mortality. All patients should have their underlying cause of PC investigated and have targeted therapy. In this novel case, a 68-year-old man developed PC following an aorto-bilateral common iliac artery mycotic aneurysm excision. Fortunately, he was asymptomatic and underwent close surveillance of this condition until near resolution. This case highlights the need for correlation of the patient's symptoms and clinical features with appropriate aetiology and pathogenesis mechanism of the disease to guide management and optimise health outcomes.

Keywords: pneumatosis coli; mycotic aneurysm

Abbreviations

Pneumatosis Coli	: (**PC**)
Computerised Tomography	: (**CT**)
Methicillin Sensitive Staphylococcus Aureus	:(**MSSA**)
Common Iliac Artery	:(**CIA**)
Computerised Tomography Abdomen Pelvis	:(**CTAP**)

Introduction

Pneumatosis coli (PC) is a radiological sign which is defined as the presence of gas in linear or cystic form in the submucosa or subserosal wall of the large intestine [1]. Although a rare occurrence, reported cases range from benign aetiology to life-threatening intraabdominal conditions [2]. A large proportion of patients are asymptomatic, however few commonly present with symptoms of diarrhoea, nausea, vomiting, haematochezia, weight loss, tenesmus, abdominal pain or distension and constipation [3]. Diagnosis is made through abdominal CT scan which includes features of circumferential (cystic) collections of air next to the lumen of the bowel wall, running parallel with the bowel wall or intraluminal air characteristically seen by linear collections with air-contrast or air-fluid levels [4]. Concerns are raised when intestinal ischaemia is noted on CT by decreased mural contrast-enhancement and the presence of portal venous gas [4]. The pathogenesis of PC is likely multifactorial and poorly understood in the literature. Causes range from mechanical tears along the luminal surface of the bowel mucosa to gas producing bacterial infection such as Clostridium perfringens infiltrating the bowel submucosa [3-5]. We highlight a case of PC occurring post-operatively in a man who underwent excision of a left aorto-iliac mycotic aneurysm secondary to septic arthritis of his left first metatarsophalangeal joint. This case highlights the importance for medical practitioners to identify the potential aetiology and pathogenicity pathways of PC and management options involved.

Case Report

A 68-year-old man who is an ex-smoker with a past history of hypertension and ischaemic heart disease underwent a washout and debridement of his left first metatarsophalangeal joint due to septic arthritis. Intraoperative specimens grew MSSA and he was commenced on intravenous flucloxacillin. Postoperatively, he developed intermittent fevers and back pain. CT-angiogram of the patient's thoracic and lumbar spine revealed a 6.7cm left common iliac artery (CIA) aneurysm with focal uptake via a labelled white cell scan in the abdominal aortic aneurysmal wall suggestive of a mycotic aneurysm. The patient was taken emergently to theatre. A transperitoneal approach was performed via a midline laparotomy. Proximal control was at the infrarenal aorta and distal control was established by clamping both internal and external iliac arteries. A small focus of shallow ulceration was found on the duodenum which did not require repair after consultation with the general surgical team. Mycotic aneurysmal components involving the distal aorta, most of the left CIA and the proximal half of the right CIA were excised. An intraoperative decision was made to perform an in-situ reconstruction with a 16x8mmx8mm bifurcated Dacron graft. Histopathology revealed aortitis, without growth on culture and polymerase chain reaction testing.

The patient made an uneventful recovery and was discharged home with lifelong oral antibiotics. Routine surveillance CT-angiogram performed six weeks post-operatively demonstrated incidental new minor pneumatosis of the descending, transverse colon and part of the splenic flexure but no features of intestinal ischaemia (**Figure 1**).

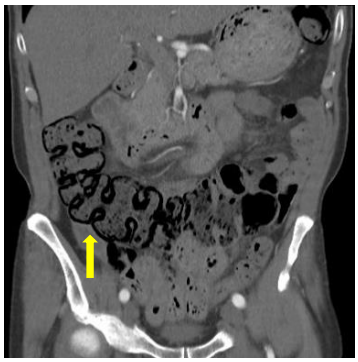

Figure 1: *Initial CTAP without contrast demonstrating PC (as shown by the yellow arrow) without evidence suggestive of intestinal ischaemia*

Urgent outpatient consultations with the vascular and colorectal teams were organised. Fortunately, the patient was asymptomatic, with no reported abdominal pain or bowel changes. On examination, his abdomen was undistended, soft and non-tender. Digital rectal examination was normal. Interval surveillance CT-Abdomen Pelvis (CTAP) with contrast performed one week later (**Figure 2**) showed increased distribution of PC but this was much improved in another CTAP scan one month later (**Figure 3**).

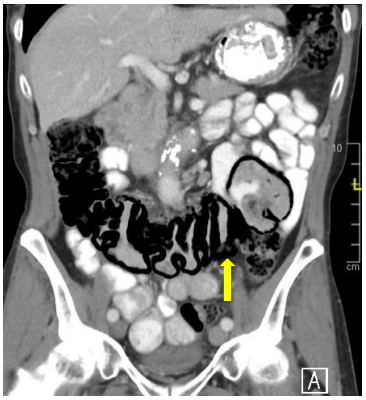

Figure 2: *CTAP with contrast 1 week later demonstrating increased distribution of PC (as shown by the yellow arrow)*

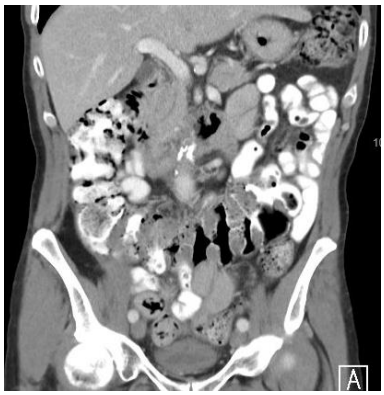

Figure 3: *CTAP with contrast 1 month later demonstrating resolving distribution of PC*

As he was still asymptomatic, he was subsequently discharged from the colorectal clinic and followed up with his general practitioner.

Discussion

The two main challenges of PC are to avoid misdiagnosis as a malignancy or polyposis and to differentiate between the benign variety which requires conservative/medical management or the life-threatening form which requires emergent theatre [3].

The majority of cases of PC are idiopathic [2]. However, there is a wide variety of secondary causes related to gastrointestinal and non-gastrointestinal pathologies. The pathogenesis of PC can be classified as a mechanical, bacterial and biochemical. With mechanical causes, gas infiltrates into the bowel wall through breaks in the mucosa from the luminal surface or by tracking along the mesenteric blood vessels through the serosal surface [4]. This accounts for conditions such as necrotising enterocolitis, bowel ischaemia, inflammatory bowel disease and intestinal infections. The bacterial theory suggests that gas-producing bacteria infiltrate the submucosa through breaches in the mucosa the presence of

gas within the bowel walls [2-4]. The biochemical trigger dictates that fermentation of carbohydrates produce large amounts of hydrogen gas resulting in increased intestinal luminal pressure, forcing the gas through the mucosa and becoming trapped in the submucosa [5].

All patients should have their underlying cause of PC investigated and have targeted therapy. Emergent exploratory laparotomy is indicated if they present with signs of abdominal peritonitis, have metabolic acidosis, acute kidney injury, leukocytosis greater than $12x10^9$/L, lactate greater than 3.0 mmol/L or the presence of portal venous gas or bowel dilatation on CT [2-3, 6-9].

For patients who do not fit this criterion, management is guided by their symptoms and treatments include a combination of antibiotics, hyperbaric oxygenation and elemental diet [3]. If asymptomatic as in our case, no additional therapy is necessary and repeat abdominal imaging is performed every one-three months until resolution [6-9].

Conclusion

Our predominant learning points are that PC is a rare but potentially fatal pathology that requires thorough evaluation. Correlation of the patient's symptoms and clinical features with appropriate aetiology and pathogenesis mechanism of the disease is essential to guide management and optimise health outcomes. As outlined with this case, tactful surveillance may often be all that is required to allow resolution of this rare radiological finding.

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