CASE REPORT

Atypical distribution of pneumatosis intestinalis in a patient with AIDS

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vernonsivarajah@nhs.net**SUMMARY**

An adult patient who had AIDS was admitted to hospital following a fall in which they sustained a T12 vertebral fracture. The patient incidentally was found to have pneumatosis intestinalis upon a thoracolumbar radiograph taken approximately 2 weeks after their admission to the hospital. At this point in time the patient reported having diarrhoea and a distended abdomen. The patient did not have any other medical history of note. Upon examination the patient appeared comfortable. The patient's abdomen was distended but soft and non-tender. Laboratory investigations revealed a chronic normocytic anaemia and neutropenia. It was likely that the pneumatosis intestinalis was AIDS related. A CT scan confirmed its presence but revealed an atypical distribution. Despite its dramatic appearance, the patient was successfully managed conservatively and remained well during admission.

BACKGROUND

Pneumatosis intestinalis (PI) is a term used to describe the presence of gas within the bowel wall.¹ It often has a dramatic radiological appearance and is most notably associated with life-threatening bowel ischaemia, which often necessitates surgical intervention. It is generally considered to be a rare finding, but can none the less be seen in a wide variety of other conditions, most of which are benign. These include pulmonary disorders particularly chronic obstructive pulmonary disease, intestinal infections, gastrointestinal disorders, endoscopic procedures and immunocompromised states.²

There are several reports of PI developing in patients with HIV and AIDS.^{3–6} In these cases, pneumatosis was characteristically isolated to the large bowel. We describe a case of a patient with AIDS who developed an atypical pattern of pneumatosis. The case also serves as a reminder that despite its dramatic appearance, its presence does not always indicate a need for surgical intervention and that selected patients can be successfully managed conservatively.

CASE PRESENTATION

An adult inpatient was referred to the on-call surgical team because of an incidental finding of PI on a thoracolumbar radiograph. The patient had been admitted to the hospital 2 weeks earlier following a fall in which they sustained a T12 vertebral crush fracture. This was being managed conservatively with a back brace while further neurosurgical input was being sort. The patient was known to have

AIDS with a CD4 count of 46. The patient had been non-compliant with the antiretroviral medications for many years but was taking prophylactic septrin.

Upon admission the patient was noted to have a chronic normocytic anaemia with a haemoglobin of 6.6g/dl. The haemoglobin returned to normal and remained stable following a blood transfusion. A diagnostic oesophagogastrroduodenoscopy (OGD) carried out 4 days after admission was entirely normal. The procedure was simple and was carried out without any complications. Importantly, a radiograph of the thoracolumbar vertebrae taken a week after the OGD did not show any evidence of PI. This was only observed on a further thoracolumbar radiograph taken 1 week after this one (figure 1). This prompted a CT scan of the abdomen and pelvis (figure 2) and a referral to the on-call surgical team.

At the time of referral the patient was reported to have diarrhoea and a distended abdomen. The patient did not have any abdominal pain, weight loss or fever and had not passed any blood or melaena per rectum. The patient was mobile and did not have any neurological symptoms. Upon examination the patient appeared well and was haemodynamically stable and afebrile. The patient had a mildly distended abdomen but it was soft and non-tender, and bowel sounds were normal.

INVESTIGATIONS

Laboratory investigations revealed a low white cell count of $2.9 \times 10^9/l$, C reactive protein of 7mg/l, haemoglobin of 11.4g/dl, mean cell volume of 85.4fl, platelets of $480 \times 109/l$ and a normal renal function. An arterial blood gas revealed pH 7.43, pCO_2 3.8, pO_2 11.2, HCO_3 21.7 and lactate 2. Stool and blood samples were not taken for culture.

A CT scan of the abdomen and pelvis revealed distended fluid-filled jejunal and ileal bowel loops up to 3.7 cm in diameter with gas in the bowel wall. There was also extensive gas in the small bowel mesentery, along the extraluminal surface of the superior mesenteric artery. There was no gas in the stomach or duodenal wall (figure 2).

OUTCOME AND FOLLOW-UP

Despite the dramatic radiological appearance of PI, the patient was successfully managed conservatively and was allowed to eat and drink freely. The neurosurgical team felt that surgical intervention for her T12 vertebral fracture was not in her best

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Figure 1 Radiograph of the thoracolumbar vertebrae showing multiple distended loops of small bowel with an evidence of pneumatosis intestinalis.

interest and so the patient was discharged. Unfortunately, the patient was readmitted 6 weeks later and died secondary to pneumocystis jiroveci pneumonia.

Figure 2 A CT scan of the abdomen and pelvis on lung window demonstrating gas in the small bowel wall (A), its mesentery (B) and along the extraluminal surface of the superior mesenteric artery (C).

DISCUSSION

PI is a rare radiological finding, which may be seen in a wide range of benign and life-threatening conditions. In the present case, the PI was benign and likely to be AIDS related. The other potential cause for PI could be speculated to be a consequence of the OGD. However, there are three reasons for why this was unlikely. First, the thoracolumbar radiograph taken a week after the OGD did not show any evidence of PI. It was only on the repeat radiograph taken 2 weeks after the OGD that the PI was noted. Second, there was no evidence of gas in the wall of the stomach or proximal jejunum, which would in theory be expected following an OGD. Finally, after an OGD, one would expect the small bowel to be filled with gas rather the fluid, which was not the case in this patient.

AIDS-related PI is uncommon. In previously described cases, the distribution of gas is predominant to the colon, particularly the caecum and ascending colon.^{3–6} These have been said to be ‘typical’ features.⁶ However, in this case it was the small bowel and its mesentery that were involved. The only other reports of small bowel PI were of a child with HIV⁷ and an adult patient with AIDS.⁸ In the latter case, the large bowel was also involved. It is important to note here that these so called typical features are based only on a small series of cases and therefore it may not be enough to create a firm conclusion about its typical distribution.

AIDS-related PI is often but not always associated with an underlying opportunistic intestinal infection. When present, this is commonly *Cryptosporidium*.⁶ Interestingly, *Cryptosporidium* tends to affect the small bowel, particularly the jejunum. Radiologically this appears as small bowel wall thickening and dilation secondary to increase intestinal secretions.⁹ Taking this into account, it seems surprising that the majority of cases of AIDS-related PI affected the large bowel rather than the small bowel. In the case we have described however, there was an evidence of dilated fluid-filled small bowel with PI, which would fit with a *Cryptosporidium* infection. If this was true, it may account for the low white cell count and diarrhoea. Unfortunately no samples were taken to prove this. It is important to note here that despite intestinal infections being present in these patients, they can be relatively asymptomatic making diagnosis difficult.⁶

There are two popular theories for the pathogenesis of PI. Both of which may be relevant to this case. The mechanical theory suggests that gas traverses the luminal surface of the bowel wall through breaks in the mucosa in conjunction with an increased intraluminal pressure.¹⁰ These breaks in the mucosa are also implicated in the bacterial theory, which suggests that gas-forming bacteria gain access to the submucosa via the breaks and produce gas within the bowel wall.¹¹ In this case, an underlying opportunistic intestinal infection, which was possible, may have compromised the integrity of the small bowel mucosa allowing gas or gas-forming bacteria to pass. An increased intraluminal pressure secondary to the distended fluid-filled small bowel loops may have also contributed.

The presence of PI often raises great concern because of its well-known association with life-threatening conditions such as intestinal ischaemia. Consequently, it often provokes an initial response that surgical intervention is required. However, in the majority of cases this is usually not necessary and the patient can be successfully managed conservatively. Identifying which patients can be managed this way largely relies on clinical, laboratory and radiological findings. The importance is with ruling out life-threatening causes such as intestinal ischaemia

and bowel obstruction as well as ruling out complications that may arise from PI such as perforation leading to intra-abdominal sepsis.

Learning points

- ▶ AIDS-related pneumatosis intestinalis (PI) is thought to typically affect the large bowel, however we have shown that the small bowel can also be involved.
- ▶ An underlying opportunistic intestinal infection is often present and therefore patients should be investigated for this.
- ▶ PI can be successfully managed conservatively in selected patients.

Competing interests None.

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