Aeroportia and pneumatosis intestinalis: discrepancy between radiological and intraoperative findings

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DESCRIPTION

Pneumatosis intestinalis (PI) and aeroportia refer to gas within the intestinal wall and in portomesenteric vessels, respectively. These two entities are not pathognomonic of bowel infarction when separate, but when joint are strongly associated with bowel ischaemia,¹ which is the primary cause and accounts for 70% of cases.^{2,3} Other causes of PI and aeroportia are ulcerative colitis, gastric ulcers, diverticulitis, acute pancreatitis and following invasive procedures.²

The pathogenesis is not yet fully known but it is thought to be due to mucosal disruption or the presence of gas-forming bacteria.¹

A contrast-enhanced abdominal CT is useful to establish the diagnosis, determine the underlying aetiology and diagnose associated complications.

When confronted with patients with both entities, an emergent exploratory laparotomy should be done. However, in the face of PI alone, medical conservative approach can be an option if there are no clinical features suggesting underlying acute abdominal emergency.⁴

The association of aeroportia to PI carries a worse prognosis^{5,6} and contributes to a higher mortality rate (85% of patients).⁶

A 90-year-old woman with a history of hypertension, and no other comorbidities, presented to the emergency department complaining of abdominal pain, vomiting, diarrhoea and weight loss with a month of evolution. Clinically, she appeared

Figure 2 Laparotomy findings - distension and wall thickening of the loops, with pneumatosis and petechiae in the mesentery associated (thick yellow arrows). Fibrin (thin yellow arrow) was found from the jejunum's perforation.

dehydrated, confused, tachycardic and hypotensive and presented with acute abdomen. Laboratory findings revealed haemoglobin 8.8 g/L, leucocytosis, metabolic acidosis with hyperlactacidaemia. An abdominal angioCT scan (figure 1) showed diffuse intestinal pneumatosis and exuberant aeroportia; extensive venous thrombus in the tributary of the superior mesenteric vein, from venous drainage of a solid mass adjacent to the sigmoid.

With these findings, a massive bowel ischaemia was assumed and supportive care with pain control and fluid replacement was established.

After re-evaluation, we observed a remarkable improvement of the haemodynamic status (being able to have a three-digit arterial tensions) and a significant decrease in lactate levels (45 to >20 mmol/L). This prompted us to move on to exploratory laparoscopy: a hyperaemic healthy small bowel was found, and since the anaesthesiologist was having trouble ventilating the patient, we converted to laparotomy (figure 2). We observed diffuse distension of the bowel and a wall thickening of proximal jejunum in relation to a contained perforation. The reason for jejunum's perforation is unknown (our hypothesis was a foreign body). We also found pneumatosis and petechiae in the mesentery and a large sigmoid tumour as expected. A primary repair of the jejunum's perforation was performed. The sigmoid neoplasm was not approached as it was a damage control surgery.

Some hours after surgery, we noticed progression of septic shock: the patient became hypotensive again, with a sinking of consciousness and had an episode of vomiting aspiration, so she had to be intubated. Being the patient elderly and frail, and since she never stopped needing aminergic

Figure 1 AngioCT scan that shows diffuse intestinal pneumatosis (dotted yellow arrows), exuberant signs of aeroportia (yellow arrows) and a large sigmoid mass (orange arrow).

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Learning points

- Aeroportia and pneumatosis intestinalis (PI) are not pathognomonic of bowel infarction, and some non-ischaemic conditions have been described with these imaging findings.^{1 11}
- These signs should be seen as another diagnostic clue in patients with acute abdomen; thus, the treatment approach should be directed at the underlying disease.¹¹
- The clinical outcome of these patients depends more on the severity of their clinical presentation and extent of their underlying disease.^{11 12}
- Diagnostic laparoscopy may be useful for ruling out the lethal conditions associated with PI in frail elderly patients with severe conditions in the emergency setting.¹⁰

and ventilatory support, it was decided with her family only supportive measures, dying on the third postoperative day.

Mesenteric venous thrombosis is a rare cause of mesenteric ischaemia,⁷ accounting for 10% of the cases.⁸

In this specific case, venous thrombus was perhaps the result of the malignancy that contributed to the prothrombotic state. It presented in a subacute manner, since symptoms lasted weeks until diagnosis.⁷ Venous thrombosis was restricted to peripheral branches, which often translates in visible dilation and oedema of the loops, as in our patient.⁹ The existence of thick walled loops or poor contrast uptake and peritoneal effusion suggests intestinal ischaemia and eventual need for surgery.⁹ Other rarer signs, but with ominous prognosis, are the existence of pneumatosis intestinal tract, portal vein air or pneumoperitoneum.⁹

Given the CT findings and being our patient a frail elderly one, we decided to perform a diagnostic laparoscopy, because it is a minimally invasive surgical procedure and it may be a useful

option for definitively ruling out the lethal conditions associated with PI.¹⁰

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