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Portomesenteric venous gas and pneumatosis intestinalis secondary to mesenteric ischaemia

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DESCRIPTION

We describe a case of a 61-year-old Caucasian man who presented to the emergency department because of severe periumbilical pain associated with nausea and vomiting. On examination, there was gross distension with generalised tenderness, more prominent in the left iliac fossa. The patient was afebrile and parameters were stable.

Coronal and axial CT images showed extensive branching radiolucency extending to within 2 cm of the liver capsule, which is characteristic of portal venous gas (PVG) and differentiates it from pneumobilia ([figure 1](#)). Gas was also present throughout the superior mesenteric vein and its tributaries (closed arrow, [figure 2B](#)). A large portion of the small bowel wall showed band-like intramural gas (open arrow [figure 2A](#)), in keeping with pneumatosis intestinalis (PI).

A laparotomy was performed and ~400 cm of infarcted small bowel resected with formation of a jejunostomy and mucous fistula. Intraoperatively, all arteries were found to be patent on palpation. Intestinal integrity was restored 2 months after the first surgery and after 5 months of inpatient care, the patient was discharged with short bowel syndrome.

The most common cause of PI and PVG is bowel ischaemia (~70% of cases); however, with the increased use of CT imaging, both PI and PVG are being encountered more frequently and owing to several other conditions including mechanical causes such as complete or partial bowel obstruction, trauma, radiation and diverticulitis, as well as benign idiopathic causes such as recent surgery, inflammatory bowel disease and kayexalate use.¹ Such findings therefore present a dilemma in the

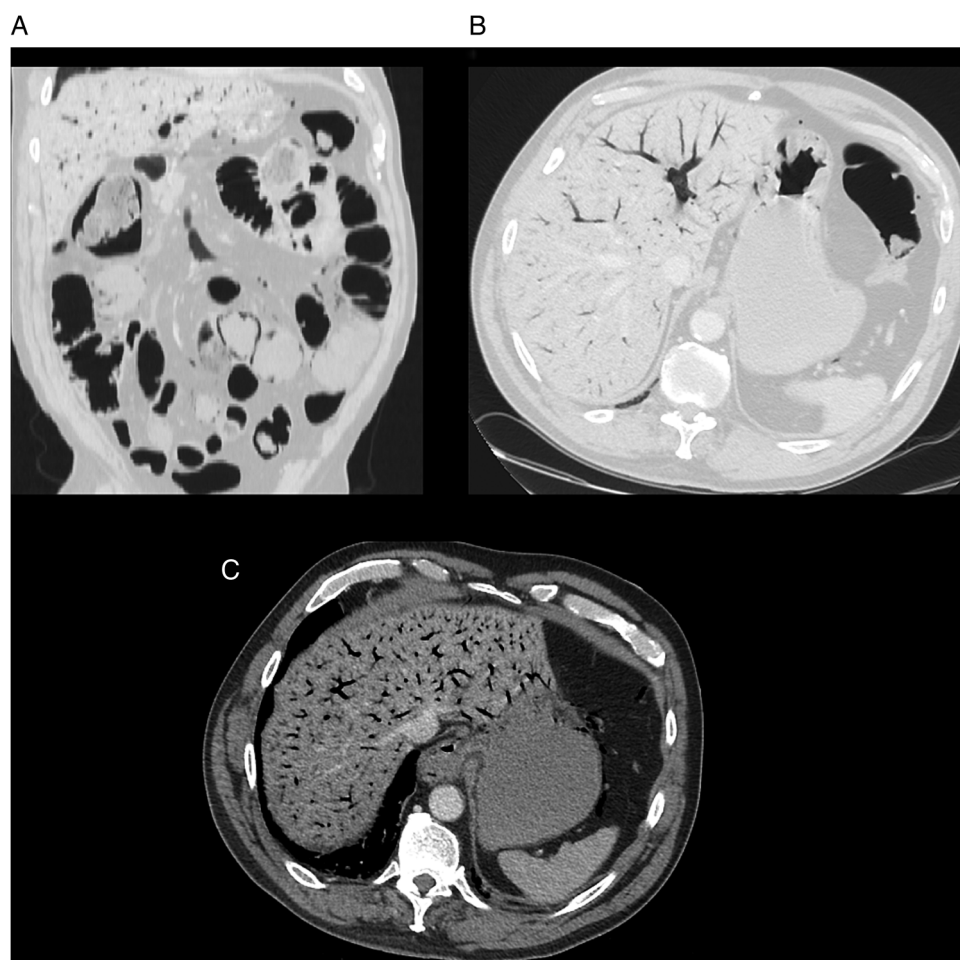


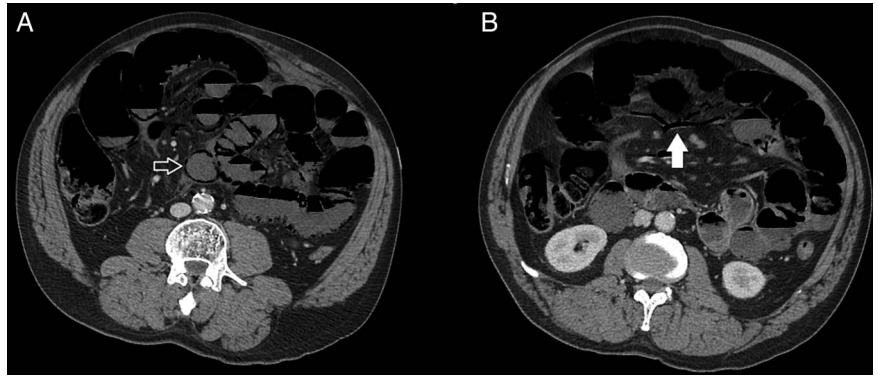
Figure 1 (A) Coronal reconstruction showing portal venous gas and dilated small bowel loops with band-like pneumatosis intestinalis; (B and C) showing extensive portal venous gas as well as gas within the stomach wall.



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Figure 2 (A) Showing dilated bowel loops with fluid levels and extensive pneumatosis intestinalis. The open arrow highlights the band-like distribution of gas within the bowel wall. The closed arrow in (B) showing gas with the tributaries of the superior mesenteric vein.



differential diagnosis and management of PVG; and/or PI as an exploratory laparotomy performed on all these patients would result in up to 30% of patients being subjected to an unnecessary procedure.²

Although ischaemic bowel carries a high mortality rate of up to 75–90%, the presence or degree of PVG and PI does not necessarily confer a higher mortality rate. Both PVG and PI may occasionally be found even in patients with only partial bowel ischaemia. Therefore, neither PVG nor PI can be used to distinguish between transmural bowel infarction and only partial mural bowel ischaemia, if they are encountered as mild and isolated findings. However, transmural infarction of the affected

bowel does become likely if PI is pronounced and band like as opposed to bubble like and, more importantly, if it is combined with PVG, as in the case described.³

Currently, the basis for determining the mortality or morbidity in cases of PVG or PI is related to the underlying cause and not the presence or extent of these radiological findings. However, there are no data in the literature to suggest whether the presence of PVG or PI on CT is an indicator of an adverse prognosis in patients suffering from transmural infarction.

Contributors JV wrote up the manuscript and performed the literature review. JG contributed to the literature review and the editing of the images. KC supplied the images and reviewed the final manuscript.

Competing interests None declared.

Patient consent Obtained.

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Learning points

- ▶ Although the most common cause of portal venous gas (PVG) or pneumatosis intestinalis (PI) is bowel ischaemia, several other benign causes have been identified and therefore a laparotomy is only indicated when suspecting intestinal ischaemia based on all the radiological and clinical findings.
- ▶ Transmural infarction is more likely in the presence of both PI and PVG, however, they do not necessarily indicate a worse prognosis and prompt surgical intervention is essential to achieving a favourable outcome.

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