

## Case scenario

An 80-year-old woman with a history of hypertension and a past cerebrovascular accident was admitted to a surgical unit for severe abdominal pain and coffee-ground vomiting. A physical examination revealed tenderness over her right abdomen and blood tests showed an elevated white cell count. An abdominal X-ray and computed tomographic (CT) scan of the abdomen were performed.

Abdominal radiography showed mural gas over a segment of bowel in the right lower quadrant of the abdomen (Fig 1). A contrast-enhanced CT of the abdomen showed mural gas in a segment of small bowel in the right lower abdomen, corresponding to the radiographic findings (Fig 2). There was an associated misty mesentery (Fig 3) and decrease in bowel wall enhancement (Fig 4).

The radiological features were suggestive of acute ischaemic bowel disease with pneumatosis intestinalis. Surgery was declined because of her poor pre-morbid condition and the high operative risk, so she was treated conservatively and passed away 4 days after admission.

## Discussion

Acute ischaemic bowel disease is a surgical emergency yet this diagnosis is difficult to make clinically as the presentation varies from minor abdominal discomfort to acute abdominal pain.<sup>1</sup> Aetiologies include arterial or venous occlusion, thrombosis, and systemic hypoperfusion. Secondary vascular compromise in



FIG 1. Abdominal X-ray showing mural gas in the right lower abdomen (arrow heads)

patients with intestinal obstruction is also common. A contrast-enhanced CT is an important means of detecting the early changes of ischaemia and for determining the underlying cause but in patients with ischaemic bowels the CT findings can be non-specific.<sup>2</sup> In patients with bowel obstruction, CT has only an 80% positive predictive value for ischaemia, and up to 20% of patients will have negative findings at laparotomy for ischaemia.<sup>3</sup> Nonetheless, CT has a high negative predictive value, 95%, for ischaemic

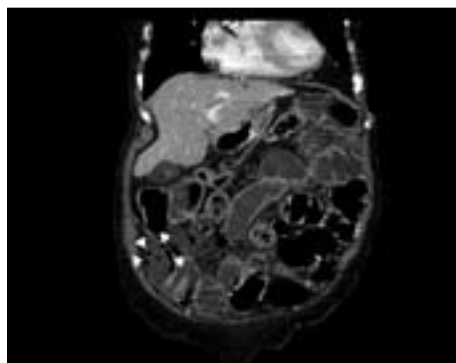


FIG 2. Contrast-enhanced computed tomogram of the abdomen (coronal reformatted image) showing corresponding mural gas in a segment of small bowel in the right lower abdomen (arrow heads)

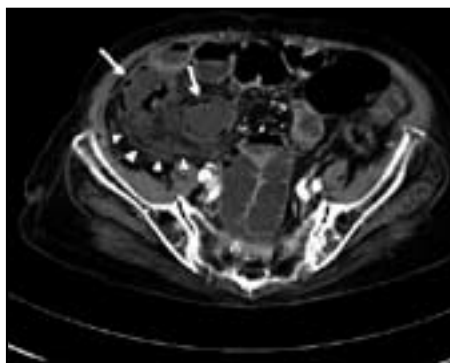


FIG 3. Contrast-enhanced computed tomogram of the abdomen showing misty mesentery (arrow heads) and mural gas (arrows)

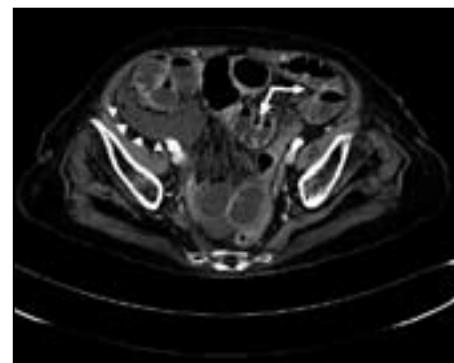


FIG 4. Contrast-enhanced computed tomogram of the abdomen showing a decrease in bowel wall enhancement of the ischaemic segment (arrow heads) compared with normal small bowel (arrows)

bowel disease, and is a useful means of triaging patients for conservative treatment.<sup>3</sup> Pneumatosis intestinalis and portomesenteric vein gas are late CT signs and usually indicate a grave prognosis.

Acute ischaemic bowel disease is a surgical emergency with a variable clinical presentation. Computed tomography has a high negative predictive value enabling exclusion of this diagnosis and is also useful for establishing the diagnosis and determining the underlying cause.

**HS Fung**, MB, ChB, FRCR  
E-mail: dicksonfunghs@gmail.com

**SSM Lo**, MB, BS

**KY Kwok**, MB, ChB

**QH Chou**, MB, BS

**WK Wong**, FRCR, FHKAM (Radiology)

Department of Radiology and Imaging

Queen Elizabeth Hospital

30 Gascoigne Road

Kowloon, Hong Kong

## References

1. Stoney RJ, Cunningham CG. Acute mesenteric ischemia. *Surgery* 1993;114:489-90.
2. Frager D, Baer JW, Medwid SW, Rothpearl A, Bossart P. Detection of intestinal ischemia in patients with acute small-bowel obstruction due to adhesions or hernia: efficacy of CT. *AJR Am J Roentgenol* 1996;166:67-71.
3. Balthazar EJ, Liebeskind ME, Macari M. Intestinal ischemia in patients in whom small bowel obstruction is suspected: evaluation of accuracy, limitations, and clinical implications of CT in diagnosis. *Radiology* 1997;205:519-22.