



Ching-Siang Cheng
John Hack

Gastric distension

A case study

Progressive gastric distension is a rare condition, which may lead to gastric wall ischaemia and perforation. It is often diagnosed late in the course of the illness after complications are already present. Early recognition, prompt referral and intervention has the potential to prevent adverse outcomes. We present a case of subacute gastric distension in an elderly woman leading to subsequent perforation and death, and describe the pathophysiology, diagnosis and management of this condition.

Keywords

abdominal pain; abdomen, acute; gastric dilation

Case study

A woman, 82 years of age, presented to the emergency department with an 8 day history of worsening generalised abdominal pain, nonfaecal emesis and abdominal distension associated with a background history of 20 kg weight loss over the past few months. She described significant emotional distress since the sudden death of her eldest son 6 months previously.

Over the preceding months she had presented several times to her general practitioner complaining of epigastric pain, anxiety and weight loss. The GP provided counselling and prescriptions for a benzodiazepine (for episodes of acute distress) and omeprazole (for the epigastric pain). Her past medical history included incidentally detected gallstones, trigeminal neuralgia, anxiety and hypertension. She had no past history of abdominal surgery, diabetes or peptic ulcer disease. A gastroscopy performed 2 months prior was normal.

On examination in the emergency department, she was obviously distressed and had a tense distended abdomen, which was tympanic to percussion. A succussion splash-on was heard on auscultation.

Question 1

What is the differential diagnosis?

Case study continued

A plain abdominal X-ray showed a distended stomach (*Figure 1*). An abdominal computed tomography (CT) scan revealed a markedly distended stomach extending to the pelvic brim with compression of the small bowel (*Figure 2*).



Figure 1. Plain X-ray of the patient's abdomen

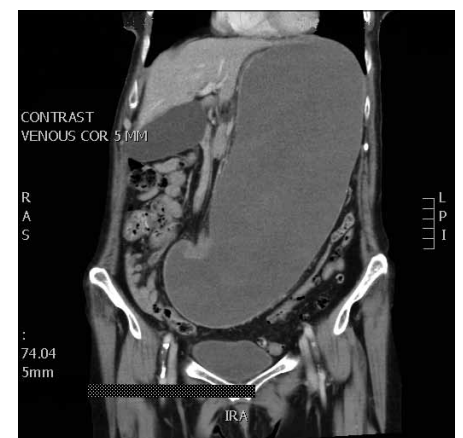


Figure 2. CT scan of the patient's abdomen

Question 2

What is the aetiology and pathophysiology of gastric distension?

Question 3

How is gastric distension diagnosed?

Question 4

What are the key elements in the initial management of this patient?

Question 5

What are the potential complications of gastric distension?

Answer 1

The history and examination findings suggest proximal gastrointestinal tract obstruction either at the level of the stomach (secondary to malignancy or a scarred benign prepyloric or duodenal ulcer) or small bowel (commonly adhesions, volvulus, hernias or neoplasm).

Answer 2

First described by Duplay¹ in 1833, gastric distension most commonly occurs as a postoperative complication. Benign aetiologies include diabetes mellitus, trauma, resuscitation, electrolyte derangements, emotional stress, superior mesenteric artery syndrome, gallstone (duodenal bulb obstruction, known as Bouveret syndrome) and others (Table 1).^{2–4} In patients with an eating disorder, the stomach may distend to extremely high volumes.

Ischaemia and perforation as a result of gastric distension is extremely rare, as the stomach is well protected against ischaemic events due to a generous collateral circulation. Chronicity in gastric distension may also play a protective role. Ischaemia and perforation occur as a result of venous insufficiency, with the point of tension needed to cause mucosal ischaemia documented as 14 mmHg.²

Septic shock and multi-organ failure as a result of gastric perforation is invariably fatal.⁵

Answer 3

Diagnosis of gastric distension from clinical signs can be a challenge in the clinical setting, as symptoms may overlap those of several other conditions including bowel perforation and blood or fluid collections. Common presenting symptoms include progressive abdominal distension and increasing abdominal pain accompanied by nonbilious vomiting. Hypotension, metabolic alkalosis and respiratory compromise may occur.⁶ If the stomach perforates, signs of generalised peritonitis may be obvious. A case has been reported of a patient with a massively distended stomach causing compromised blood flow in the abdominal aorta and leading to absent pulses in the lower limbs.⁷

Answer 4

The most important step in the initial management of this patient is to promptly decompress the stomach with a nasogastric tube (NGT). This will halt venous congestion and potential ischaemia and prevent aspiration. Fluid resuscitation with crystalloid should be initiated and titrated according to the patient's volume status, degree of renal impairment and electrolyte depletion. An urgent referral should be made to a surgical unit. Consultation with a gastroenterologist may also be required and the potential for the need for a referral to an intensive care unit should be considered early.

Answer 5

Complications of gastric distension include massive dehydration with hypochloreaemic metabolic alkalosis and prerenal failure, and perforation with resultant sepsis, multi-organ

failure and death. Complications are more likely in the elderly and already frail patients.

Case study continued

The patient had an initial potassium level of 4.2 mmol/L (reference range: 3.5–5.0). This dropped to 2.4 mmol/L after further vomiting and massive fluid losses from the NGT. Despite aggressive resuscitative efforts, the patient developed gastric necrosis, perforation and multi-organ failure. Combined anaesthetic, intensive care and surgical opinion concurred that she was not a surgical candidate and palliative management was initiated. The NGT was left in situ as a comfort measure.

Summary

This case illustrates the importance of early recognition and prompt referral and intervention in cases of progressive gastric distension in order to prevent serious adverse outcomes.

Authors

Ching-Siang Cheng MBBS, is principal house officer surgery, The Townsville Hospital Institute of Surgery, Queensland. cheng.chingsiang@gmail.com
John Hack FRACS, is Director of General Surgery, The Townsville Hospital Institute of Surgery, Queensland.

Conflict of interest: none declared.

References

- Powell JL, Payne J, Meyer CL, Moncla PR. Gastric necrosis associated with acute gastric dilatation and small bowel obstruction. *Gynecol Oncol* 2003;90:200–3.
- Todd SR, Marshall GT, Tyroch AH. Acute gastric dilatation revisited. *Am Surg* 2000;66:709–10.
- Pandey R, Maqbool A, Jayachandran N. Medical Image: massive gastric dilatation secondary to binge episode in bulimia nervosa. *N Z Med J* 2009;122:85–6.
- Kashyap AS, Chopra D, Anand KP, Arora S, Kashyap S. Acute gastric dilatation. *Emerg Med J* 2009;26:326.
- Arie E, Uri G, Bickel A. Acute gastric dilatation, necrosis and perforation complicating restrictive-type anorexia nervosa. *J Gastrointest Surg* 2008;12:985–7.
- Osmund WE, Copeland J. Gastric dilatation as a cause of respiratory distress. *Can Fam Physician* 2010;56:151–2.
- Gyurkovics E, Tihanyi B, Szijarto A, et al. Fatal outcome from extreme acute gastric dilatation after an eating binge. *Int J Eat Disord* 2006;39:602–5.
- Cox A, Marks DJB. Acute gastric dilatation causing respiratory distress. *JRSM Short Rep* 2011;2:41.

Table 1. Aetiology of gastric distension⁸

Obstruction	
Luminal	Bezoar, ingested foreign body, hyperphagia, gallstone
Mural	Gastric tumours, Crohn stricture, tuberculosis, iatrogenic (slipped gastric banding, anastomotic stricture)
Extrinsic	Lymphoma, other intraperitoneal tumours or metastases, annular pancreas, superior mesenteric artery syndrome
Dysmotility	
Autonomic neuropathy (diabetes mellitus, Parkinson disease), ileus, eating disorders	

correspondence afp@racgp.org.au