CASE REPORT

Double duodenal perforation following foreign body ingestion

Andrew W Gardner, Rami W Radwan, Miles C Allison, Rhodri J Codd

Department of General Surgery, Aneurin Bevan University Health Board, Newport, UK

Correspondence to
Rami W Radwan,
radwanr@cardiff.ac.uk

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SUMMARY

Intentional ingestion of a foreign body in adults is a rare clinical presentation. This case is one of a 27-year-old Sudanese man who presented having swallowed a ballpoint pen intentionally. Clinical examination and plain chest radiograph exhibited no signs indicative of perforation with only a raised C reactive protein identified on blood tests. Subsequent gastroscopy revealed that the pen had simultaneously perforated the duodenum at both D1 and D3 requiring removal via a laparotomy. The patient fully recovered and was discharged 2 weeks postoperatively following psychiatric input.

BACKGROUND

In the UK, foreign body (FB) ingestion occurs most commonly in children between the ages of 6 months and 6 years.[1] Ingestion by adults occurs much less frequently and is often non-intentional with the exception of those with psychiatric disorders and prison inmates.[2] The majority (80%) of ingested FBs pass through the gastrointestinal (GI) tract with no complications. However, up to 20% undergo endoscopic removal and less than 1% will require surgery.[3 4]

Perforation of the duodenum is a rare complication of FB ingestion.[5] Signs are subtle, and these patients are likely to be afebrile and have a normal white cell count (WCC) compared with those with perforations of the jejunum or ileum.[6] The index of suspicion in these patients for requiring further investigation must be lowered. We present a case in which a raised C reactive protein (CRP) of 145 mg/L was the only clinical indicator of perforation and suggests that this should be sufficient evidence to request a double-contrast CT scan.

Figure 1 Plain abdominal radiograph showing the pen in the right upper quadrant.

Figure 2 Intraoperative image showing a small perforation in D1.

CASE PRESENTATION

A 27-year-old Sudanese man attended accident and emergency with a 2-week history of worsening central abdominal pain exacerbated by eating and drinking. During this time, he had two episodes of vomiting but no change in bowel habit. He reported the pain started after intentionally swallowing a ballpoint pen in protest against possible deportation. He was otherwise fit and healthy with no medical history.

The patient had been living in UK since 2014 as an asylum seeker but was of no fixed abode. He was a native Arabic speaker, and history and consent was obtained using a translator. He was a known smoker and heavy drinker.

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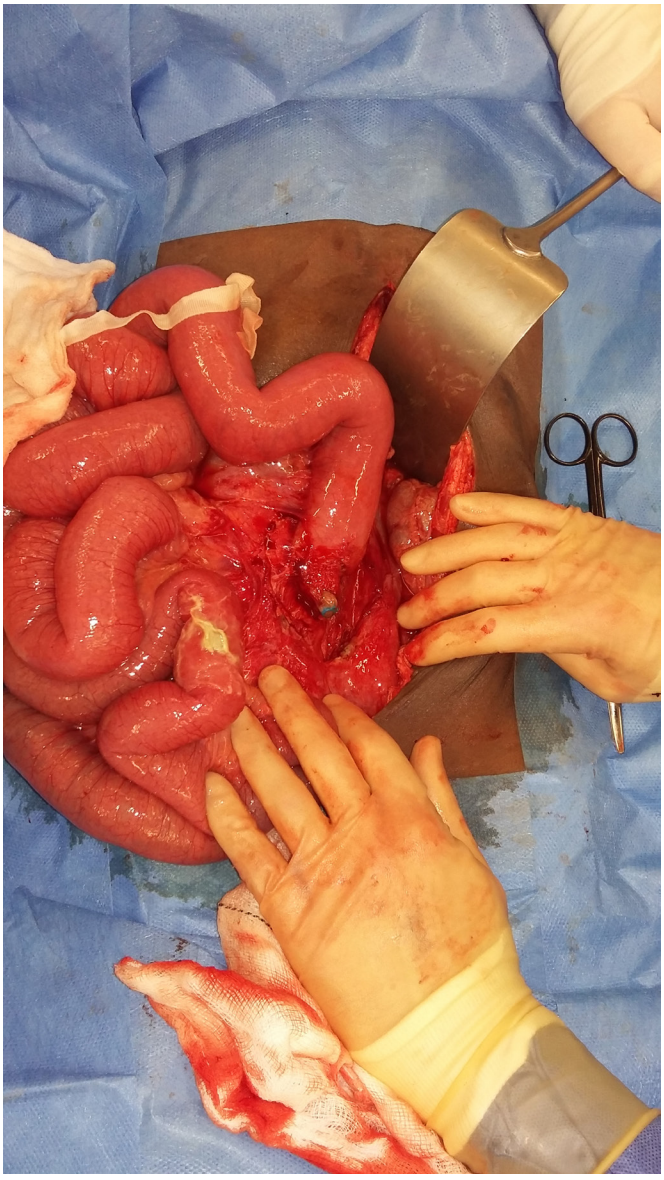

Figure 3 Intraoperative image showing a large perforation in D3.

On admission, baseline observations were unremarkable (HR: 94/min, blood pressure 101/63 mm Hg, temperature 36.7°C). Abdominal examination exhibited generalised abdominal tenderness but no signs of peritonism.

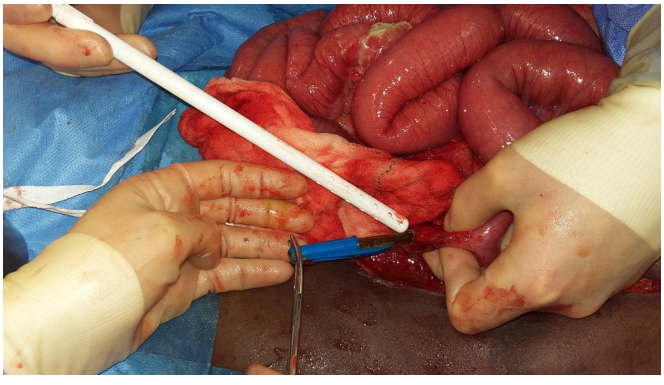

Figure 4 Intraoperative image showing the pen being successfully removed.

INVESTIGATIONS

Routine blood tests showed a normal haemoglobin and platelet count (154 g/L and 218 10^9/L, respectively), a leucocytosis (WCC 11.6×10^9/L) and a moderately increased CRP (145 mg/L).

The patient's admission chest radiograph was unremarkable with no evidence of perforation. However, an abdominal radiograph (figure 1) located the pen tip in the right upper quadrant, which was reported as likely to be wedged in the pylorus.

Gastroscopy was performed and revealed the pen had penetrated and partially exited at the duodenal bulb. There was also a second point of impaction at D3. At this point, GI surgeons decided that the risk of endoscopic removal was too high and a decision to proceed to laparotomy was made.

DIFFERENTIAL DIAGNOSIS

Differential diagnosis includes the following:

- cholecystitis, pancreatitis, appendicitis;
- small bowel obstruction;
- peptic ulcer perforation.

TREATMENT

Following gastroscopy findings, an urgent laparotomy was performed. The pen was found to be positioned past the pylorus of the stomach and had become lodged in the duodenum with a small perforation in D1 from the tip of the pen (figure 2) and a larger perforation at D3 (figure 3). The pen was successfully removed (figure 4), and both perforation sites were primarily closed with vicryl sutures and omental patching. A feeding jejunostomy was also placed during the procedure.

OUTCOME AND FOLLOW-UP

The patient's nutritional status preoperatively was very poor because of both his social circumstances and his initial complaint of pain exacerbated by eating. Due to his high risk of refeeding syndrome, dietician input was sought and nutritional supplements prescribed.

He recovered well and was discharged approximately 2 weeks postoperatively having had a psychiatric review.

DISCUSSION

Double perforations of the GI tract are rare, with no reported cases of double duodenal perforation secondary to FB within English literature. There is one reported case of double oesophageal perforation from a meat bone that was removed surgically due to its precarious position near the aorta and the azygos vein.[7]

Duodenal perforation secondary to FB ingestion is uncommon, with only a few cases identified. Wang *et al* discussed a case of a 38-year-old man who presented with a 10-day history of severe abdominal pain and a mild leucocytosis. The patient revealed that he had swallowed a 'leg of glasses' 10 months previously, and this was later seen on upper GI endoscopy in the bulbus of the duodenum. With only a small pinpoint area of perforation, a Dormia basket was used to remove the FB and titanium clips to close the perforation.[5] This endoscopic approach was also used on a 31-year-old patient who had ingested a fish bone.[8]

The European Society of Gastrointestinal Endoscopy guidelines on the management of FBs recommend a CT scan for all patients who have a suspected perforation.[4] In our case, the patient did not undergo CT imaging as there was little clinical evidence of perforation prior to endoscopy. Once endoscopy had been performed, the decision was made to proceed directly to theatre. In hindsight, we feel that a low threshold for suspecting perforation in such a patient should have been

adopted, particularly as they were presenting to the emergency department with abdominal pain following a prolonged period of previous FB ingestion. Though the outcome in this case would not have been altered, preoperative imaging would have further aided in the preparation for surgical intervention.

This case highlights the difficulty in identifying patients with a perforation as they often present with non-specific clinical signs, and this may lead to diagnostic delay.

Learning points

- Duodenal perforation following foreign body ingestion can be difficult to diagnose.
- Signs are often non-specific, and clinicians must have a low threshold for suspecting perforation.
- Any suspected peritonitis following foreign body ingestion must undergo laparotomy.
- Psychiatric input is often necessary in adult intentional foreign body ingestion.

Contributors AWG: literature search and writing report. RWR: literature search and editing. RJC: consultant involved in patient care. MCA: consultant involved in patient care.

Competing interests None declared.

Patient consent Obtained.

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REFERENCES

1 Webb WA. Management of foreign bodies of the upper gastrointestinal tract: update. *Gastrointest Endosc* 1995;41:39–51.
2 Erbil B, Karaca MA, Aslaner MA, *et al*. Emergency admissions due to swallowed foreign bodies in adults. *World J Gastroenterol* 2013;19:6447–52.
3 Ambe P, Weber SA, Schauer M, *et al*. Swallowed foreign bodies in adults. *Dtsch Arztebl Int* 2012;109:869–75.
4 Birk M, Bauerfeind P, Deprez PH, *et al*. Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* 2016;48:489–96.
5 Wang L, Wen W, Huang J, *et al*. Endoscopic Removal of a duodenal-perforating leg of glasses with dormia basket. *Case Rep Gastroenterol* 2016;10:679–84.
6 Goh BK, Chow PK, Quah HM, *et al*. Perforation of the gastrointestinal tract secondary to ingestion of foreign bodies. *World J Surg* 2006;30:372–7.
7 Ugenti I, Digennaro R, Martines G, *et al*. Double esophageal perforation by ingested foreign body: endoscopic and surgical approach. A case report. *Int J Surg Case Rep* 2015;17:55–7.
8 Tumay V, Guner OS, Meric M, *et al*. Endoscopic removal of duodenal perforating fishbone - a case report. *Chirurgia* 2015;110:471–3.