CASE REPORT

Liver perforation following foreign body ingestion: an important clinical lesson

Gareth Martel, Dorothy Johnston, Claire Jones, Julie Scoffield

Department of General
Surgery, Mater Hospital,
Belfast, UK

Correspondence to
Gareth Martel,
g.martel.04@aberdeen.ac.uk

Accepted 24 June 2015

SUMMARY

A 25-year-old woman presented to the surgical unit with a 1-week history of ingestion of a pen. Examination revealed a minimally tender epigastrium with no peritonism. Investigations were unremarkable, with normal bloods and no free air on erect chest radiograph. At the time of endoscopy, the pen appeared to have perforated the lesser curve of the stomach. Endoscopic extraction was abandoned and a CT arranged, revealing the tip of the pen lying within the left lobe of the liver. The pen was removed at laparotomy with an uneventful recovery. This case highlights the importance of considering the potential for injury to other structures following gastric perforation, and the importance of having a low threshold for further imaging.

BACKGROUND

Deliberate foreign body ingestion in adulthood is uncommon, and usually associated with underlying mental health disorder.^{1 2} Studies have shown as high as 92% of adult foreign body ingestions to be intentional, with 85% of these involving psychiatric patients.² Most foreign bodies will pass through the gastrointestinal (GI) tract without causing significant injury;^{3 4} however, in the case of sharp objects, or those of a size that are unlikely to be able to be passed, endoscopic extraction should be attempted.⁵ First-line investigations should include plain radiographs of the GI tract to aid in locating the foreign body, as well as potentially identifying the presence of a perforated viscus.⁶ Although perforation by foreign bodies is uncommon, the possibility should always be considered as this will usually necessitate a surgical approach to extraction.⁷ While perforation of the GI tract by a ballpoint pen has been previously reported,⁸ a literature search reveals no previously documented case of subsequent liver injury. This case highlights the potential dangers of foreign body ingestion, and the need to consider these clinically.

CASE PRESENTATION

A 25-year-old woman presented to the general surgical team 1 week following ingestion of a ballpoint pen. She presented with epigastric discomfort, however, oral intake remained unchanged. Examination revealed mild upper abdominal tenderness, with no evidence of peritonism. Blood tests, including inflammatory markers, were unremarkable. Erect chest and abdominal films were performed, with evidence of the pen lying within the stomach, and no evidence of free air within the abdomen (*figure 1*).

Subsequently, the patient proceeded to gastroscopy, with intent to remove the foreign body. At the time of endoscopy, the pen was visualised lying within the pylorus, however, the proximal end appeared to pass through the lesser curvature of the stomach (*figure 2*). A decision was made to abandon endoscopy and proceed to CT scan for further assessment.

CT scan was performed revealing that the tip of the pen perforated the lesser curvature of the stomach, resting at the inferior border of the left lobe of the liver (*figure 3*). There was a small amount of surrounding free air, and some free fluid related to the posterior aspect of the right lobe of the liver.

At subsequent laparotomy, the pen was found to have perforated the left lobe of the liver. A laparoscopic approach was not attempted as the patient had undergone two previous laparotomies for intussusception and oophorectomy. The pen was extracted, the gastric defect closed and haemostasis secured. Subsequent recovery was uneventful.

OUTCOME AND FOLLOW-UP

The postoperative period was unremarkable and the patient made a full recovery.

DISCUSSION

Patients with personality disorders may present to the surgical department following intentional foreign body ingestion, which may be recurrent despite psychiatric treatment.⁹ The repetitive nature of this behaviour often leads to multiple interventions, with a significant risk of serious injury, and a substantial financial implication on resources.^{10 11} While there are no clear guidelines, most clinicians would advocate repeated endoscopic removal.¹²

Figure 1 Plain abdominal X-ray showing the pen lying within the stomach.

To cite: Martel G, Johnston D, Jones C, *et al.* *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-210098

Figure 2 Photograph taken at endoscopy revealing perforation of the lesser curvature of the stomach.

Foreign body extraction can be a difficult procedure, normally requiring a general anaesthetic to prevent aspiration; it is, however, associated with relatively few complications.¹¹ The possibility of perforation should always be considered in any

Figure 3 CT image demonstrating the pen lying with its tip within the left lobe of the liver.

case of foreign body ingestion. In the case we present, abdominal signs were minimal, and plain radiographs failed to reveal the presence of free air. The endoscopic findings, however, raised the suspicion of perforation. The subsequent discovery of liver injury at the time of CT, which was then confirmed at laparotomy, highlights the importance of considering the possibility of further intra-abdominal injury, and the necessity for further imaging prior to extraction. Should removal of the foreign body have been attempted endoscopically in this case, significant haemorrhage may have occurred.

Learning points

- ▶ Foreign body ingestion in adults is uncommon, with the majority of cases involving mental health disorder.
- ▶ Although visceral perforation is rare, the possibility must always be considered.
- ▶ Should endoscopy suggest visceral perforation the procedure should be abandoned and either further imaging arranged or a laparotomy performed.

Contributors GM coordinated the project, performed the literature review and compiled the case report. DJ collected and formatted the images. CJ and JS reviewed and revised the draft paper.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Atluri D, Veluru C, Chopra A, *et al*. Recurrent intentional foreign body ingestion: an endoscopist's dilemma. *Gastroenterol Hepatol (N Y)* 2012;8:482–4.
- 2 Palta R, Sahota A, Bemarki A, *et al*. Foreign-body ingestion: characteristics and outcomes in a lower socioeconomic population with predominantly intentional ingestion. *Gastrointest Endosc* 2009;69(3 Pt 1):426–33.
- 3 Müller KE, Arató A, Lakatos PL, *et al*. Foreign body impaction in the sigmoid colon: a twenty euro bet. *World J Gastroenterol* 2013;19:3892–4.
- 4 Palese C, Al-Kawas FH. Repeat intentional foreign body ingestion: the importance of a multidisciplinary approach. *Gastroenterol Hepatol (N Y)* 2012;8:485–6.
- 5 Ambe P, Weber SA, Schauer M, *et al*. Swallowed foreign bodies in adults. *Dtsch Arztebl Int* 2012;109:869–75.
- 6 Lee JH, Kim HC, Yang DM, *et al*. What is the role of plain radiography in patients with foreign bodies in the gastrointestinal tract? *Clin Imaging* 2012;36:447–54.
- 7 Karcz WK, Kulemann B, Seifert GJ, *et al*. Video. Laparoscopic extirpation of a fork from the duodenum. *Surg Endosc* 2011;25:2363.
- 8 Goffier C, Holguin F, Kobayashi A. Duodenal perforation because of swallowed ballpoint pen and its laparoscopic management: report of a case. *J Pediatr Surg* 2009;44:634–6.
- 9 Lewis C, Hsu HK, Hoover E. Aspiration of foreign bodies in adults with personality disorders: impact on diagnosis and recurrence. *J Natl Med Assoc* 2011;103:620–2.
- 10 Poynter BA, Hunter JJ, Coverdale JH, *et al*. Hard to swallow: a systematic review of deliberate foreign body ingestion. *Gen Hosp Psychiatry* 2011;33:518–24.
- 11 Huang BL, Rich HG, Simundson SE, *et al*. Intentional swallowing of foreign bodies is a recurrent and costly problem that rarely causes endoscopy complications. *Clin Gastroenterol Hepatol* 2010;8:941–6.
- 12 Frei-Lanter CM, Vavricka SR, Kruger TH, *et al*. Endoscopy for repeatedly ingested sharp foreign bodies in patients with borderline personality disorder: an international survey. *Eur J Gastroenterol Hepatol* 2012;24:793–7.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow