Delayed presentation of a small bowel perforation secondary to an ingested denture

Pranav H Patel • Alistair AP Slesser • Praveena Idaikkadar • Ioanna Kostourou • Reda W Awad

Department of General Surgery, Watford General Hospital, Watford, Herts WD18 0HB, UK
Correspondence to: Pranav H Patel. Email: pranav.patel@doctors.org.uk

DECLARATION

Competing interests
None declared

Funding
None

Ethical Approval
Written informed consent to publish the article was obtained from the patient or next of kin.

Guarantor
PHP

Contributorship
PHP wrote and edited the case report, discussion and conclusion. PHP performed the literature review and formatted all figures. AAP reviewed and edited the manuscript. PI wrote the case report alone. IK reviewed the manuscript. RWA provided final manuscript review and editing.

Acknowledgments
None

Denture ingestion with bowel perforation is rare. We report a case, with literature review, where successful emergency surgery was performed.

Case report

A 64-year-old Caucasian woman complaining of a two-day history of acute abdominal pain with associated emesis was admitted as an emergency to our surgical unit. She had not opened her bowels or passed flatus for two days. On examination the abdomen was distended with generalized peritonitis. Digital rectal examination was unremarkable. She was hypothermic with a heart rate of 120 and a systolic blood pressure of 70 mmHg. Routine blood investigations revealed haemoglobin of 10.4 g/dL, white blood cells of 2.84×10^9/L and a C-reactive protein of 428 mg/L. Arterial blood sampling revealed a pH of 7.22, a base excess of −14.6 and a lactate of 10.8 mmol/L. Her past surgical history included a hysterectomy in 1981. Medical co-morbidities included hypertension.

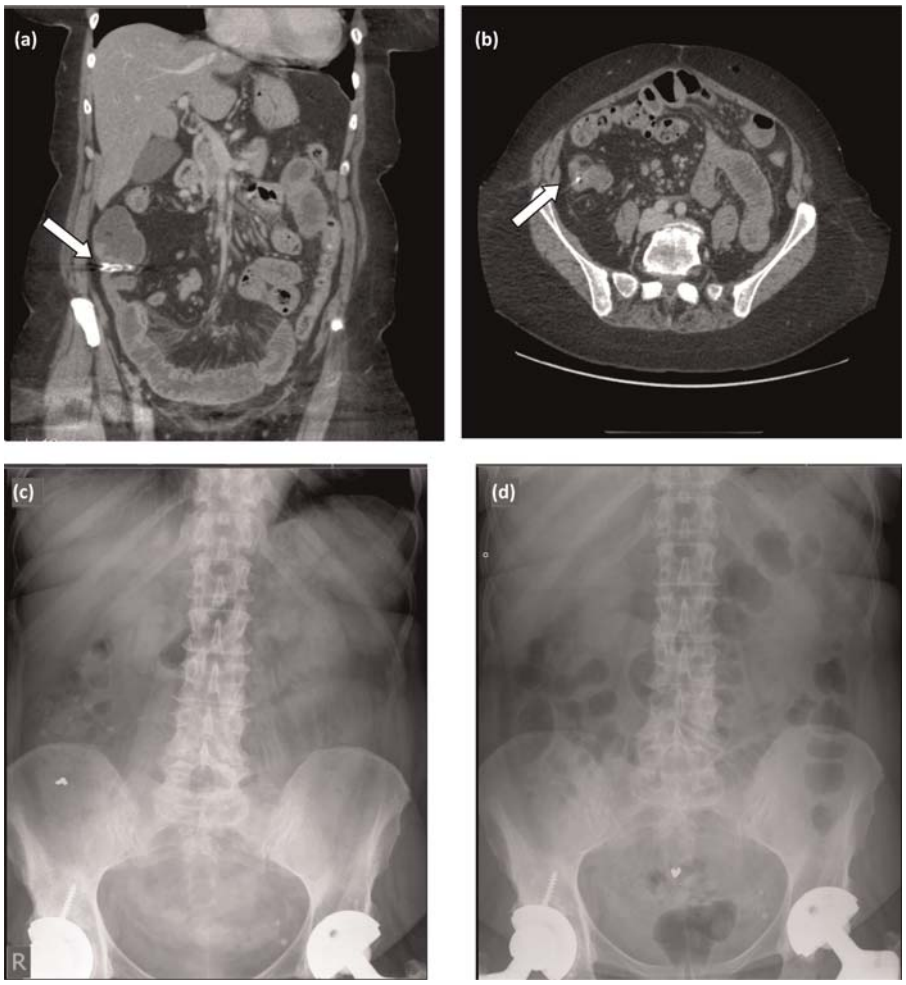
The patient had been admitted three months earlier, and treated conservatively, for small bowel obstruction secondary to an accidental ingestion of her denture bridge two months prior to this. On the previous admission, a computed tomography (CT) of the abdomen and pelvis suggested that the bridge was within the caecum (Figures 1a and b). Several days later the obstruction had resolved with conservative management. Repeat plain abdominal X-ray films suggested that the denture had passed from the caecum (Figure 1c) into the sigmoid colon (Figure 1d). It was thus felt at that time that it would pass spontaneously. The patient remained completely asymptomatic until the acute presentation.

Despite aggressive fluid resuscitation, the patient continued to deteriorate and it was decided to perform an emergency laparotomy. Intraoperatively, an ileal perforation 40 cm from the ileocaecal junction was found with minimal faecal contamination. The small bowel perforation was secondary to denture erosion through the wall of the small bowel, with non-viable distal small bowel. A limited right hemicolectomy and small bowel resection was performed, with an end to end hand-sewn ileo-colic anastomosis. The patient developed a postoperative ileus, but otherwise made a good postoperative recovery and was discharged back to the community.

Discussion

The prevalence of adults wearing dentures is high, with approximately 20% of adults between the ages of 18 and 74 wearing dentures.[1] Despite this, the incidence of accidental swallowing or aspiration of dentures remains rare. Webb[2] reported that in a series of 192 adult patients who had swallowed a foreign body (FB), only three were dental hardware (1.56%). In our case, the patient was able to give a clear history of denture ingestion enabling a high index of suspicion that her previous denture ingestion was related to her acute abdomen. However, eliciting a clear history in such cases is often not possible as many patients may present with alcohol intoxication, dementia, learning disabilities or in moribund conditions.[3] Accurate history taking, if possible, is paramount in attaining a clinical diagnosis prior to imaging. As highlighted by our review of similar cases, the presenting symptoms

Figure 1
Imaging on initial admission. (a) Spiral computed tomography image with coronal slice reconstruction, showing dental bridge in the caecum of the large bowel on initial presentation following ingestion of foreign body. Artefact around the image is a result of ferrometalic disturbance of the foreign body. (b) Spiral computed tomography image, axial slice, showing dental bridge in the caecum of the large bowel on initial presentation following ingestion of foreign body. (c) Plain abdominal radiograph performed on initial presentation showing placement of the denture bride in the right lower quadrant, in keeping with the caecum of the large bowel. (d) Plain abdominal radiograph performed five days after initial presentation showing placement of the denture bridge in the pelvis, in keeping with the distal, likely sigmoid colon



and time to presentation following denture ingestion can vary greatly (Table 1). However, similar reported cases of denture ingestion mainly presented acutely with abdominal pain as the presenting symptom (Table 1). Interestingly, our case was unusual due to the delayed presentation of our patient, five months postingestion, with an acute abdomen. It is thus imperative that the manifestation of abdominal symptoms, even several months postingestion of a denture, elicits suspicion of FB related pathology.

Symptoms related to FB ingestion can vary greatly and are usually associated with the anatomical site of obstruction, and can include dysphagia, shortness of breath, haematemesis, retrosternal pain and fever.[4] The majority of reported

Table 1

Complete literature review of reported cases presenting with bowel perforation secondary to denture erosion, including demographics, presenting history, denture characteristics, perforating site, operative procedure and results

Author	*Year*	*Age*	*Gender*	*Country*	*Presenting symptoms*	*Denture characteristics*	*Site of perforation*	*Operation type*	*Stoma*	*Morbidity*	*Mortality*
Patel PH *et al.*	2011	64	Female	UK	Acute abdominal pain, vomiting	Denture bridge	Middle ileum	Laparotomy, ileocaecal resection	No	No	No
Bunni and Youssef[10]	2010	53	Male	UK	Constant abdominal pain, peritonism	Dental plate, single tooth	Terminal ileum	Open Lanz incision, small bowel enterotomy for retrieval, primary closure	No	No	No
Rashid *et al.*[4]	2008	53	Male	UK	Intermittent abdominal pain	Dental bride	Terminal ileum	Laprotomy, ileocaecal resection	No	No	No
Ghori *et al.*[7]	1999	38	Female	UK	Constant abdominal pain, peritonism	Upper Denture	Middle Sigmoid	Laparotomy, Hartmanns procedure	Descending colostomy	Yes (septic shock)	Yes (day 10 post-op)
Peison *et al.*[12]	1995	48	Male	USA	Constant Abdominal pain.	Dental plate	Sigmoid colon	Laparotomy, Hartmanns procedure	Descending colostomy	No	No
Cleator and Christie[8]	1973	62	Female	UK	Constant abdominal pain, peritonism	Dental plate, double tooth	Proximal sigmoid	Laparotomy, sigmoid colectomy, primary anastomosis	Tranverse colostomy	No	No

complications associated with denture ingestion involve the oesophagus or upper respiratory tract. In addition, other complications such as per rectal haemorrhage, melaena, obstruction, perforation and fistula formation have been reported following ingested dentures.[5–8] However, lower gastrointestinal complications remain rare, with only one other case describing terminal ileal perforation secondary to denture ingestion (Table 1).[4]

Our case demonstrates that the interpretation of radiological imaging post-denture ingestion can be difficult or misleading. Most dentures consist of polymethylmethacrylate which is radiolucent and thus difficult to visualize on plain radiographs.[2] Furthermore, CT scanning can be affected by artefact and magnetic resonance imaging is only appropriate if it is known that the ingested bridge does not contain any metal.[9] Management of ingested FBs, such as dentures, remains controversial with no clear national guidelines available. The denture in our case was longer than 5 cm and had a diameter greater than 2 cm. Objects of this size are thought to rarely pass through the stomach, but if they do, they are associated with a high risk of ileo-caecal perforation at the valve and should therefore be removed at an early stage.[1,10] The suggested management for patients with sharp FB ingestion is initially conservative, with close monitoring and observation for a period of three days. If conservative management fails, and the site of obstruction is upper gastrointestinal, then an intervention in the form of an endoscopic procedure should be considered in the first instance, as most dentures are easily retrieved in this manner.[1,11] Clearly if the site of obstruction is in the lower gastrointestinal tract, then failed conservative management should lead to an early surgical intervention to prevent serious complications related to perforation (Table 1). Cases such as ours, where there are signs of peritonism or suspicion of a perforated viscus, are an indication for an emergency laparotomy. In several reported cases of large bowel perforation secondary to denture ingestion a stoma was required (Table 1). In our case, due to the prompt surgical intervention and the site of the perforation, the patient did not require a stoma. In cases of lower gastrointestinal tract obstruction associated with perforation, a stoma may be inevitable (Table 1).[7,8,12] This should, however, be a consideration and, if possible, the patient should be informed preoperatively of the possibility of a stoma. We performed an ileo-caecal resection due to the proximity of the terminal ileal perforation to the ileo-caecal valve and the unviable distal ileum. However, as reported by Bunni and Youssef[10], if there is no faecal contamination it is possible to perform a small bowel enterotomy with a primary closure (Table 1). Follow-up of patients having suffered a lower gastrointestinal obstruction following FB ingestion is paramount. This should include careful histological report assessment, follow-up imaging or endoscopic procedures to exclude pathologies such as small bowel strictures as a result of neoplasia or inflammatory bowel disease such as Crohn's colitis.[13,14]

Conclusion

Our case highlights that the ingestion of FBs such as dentures, can lead to a delayed presentation with an acute abdomen necessitating emergency surgery. It is thus paramount to follow-up such patients after the initial ingestion to ensure that the denture or FB has passed out of the alimentary canal. The continued presence of an FB such as a denture in the lower gastrointestinal tract, should be electively managed at an early stage to avoid the risks of emergency surgery including stoma formation and mortality.

References

1 Haidary A, Leider JS, Silbergleit R. Unsuspected swallowing of a partial denture. *Am J Neuroradiol* 2007;**28**:1734–5

2 Webb WA. Management of foreign bodies of the upper gastrointestinal tract: update. *Gastrointest Endosc* 1995;**41**:39–51

3 Chin RY, Ellul S. Dysphagia after emergency intubation: case report and literature review. *Dysphagia* 2009;**24**:105–8

4 Rashid F, Simpson J, Ananthakrishnan G, Tierney GM. Swallowed dental bridge causing ileal perforation: a case report. *Cases J* 2008;**1**:392

5 Singh B, Har-el G, Kantu M, Lucente FE. Complications associated with 327 foreign bodies of the pharynx, larynx, and esophagus. *Ann Otol Rhinol Laryngol* 1997;**106**:301–4

6 Hashmi S, Walter J, Smith W, Latis S. Swallowed partial dentures. *J R Soc Med* 2004;**97**:72–5

7 Ghori A, Dorricott NJ, Sanders DSA. A lethal ectopic denture: an unusual case of sigmoid perforation due to unnoticed swallowed dental plate. *J R Coll Surg Edinb* 1999;**44**:203–4

8 Cleator IG, Christie J. An unusual case of swallowed dental plate and perforation of the sigmoid colon. *Br J Surg* 1973;**60**:163–5
9 Firth AL, Moor J, Goodyear PW, Strachan DR. Dentures may be radiolucent. *Emerg Med J* 2003;**20**:562–3
10 Bunni J, Youssef F. Swallowed dental bridge perforating the terminal ileum. *South Med J* 2010;**103**:593–4
11 Chiu YH, Hou SK, Chen SC, *et al.* Diagnosis and endoscopic management of upper gastrointestinal foreign bodies. *Ams Med Sci* 2012;**343**:192–5
12 Peison B, Benisch B, Lim E. Perforation of the sigmoid colon following ingestion of a dental plate. *N J Med* 1995;**92**:452–3
13 Leff DR, Willis A, Menzies D. Dentures in a small-bowel stricture. *J R Soc Med* 2004;**97**:206–7
14 Garau MV, Vicens DG, Rigo AL, *et al.* Impacted foreign body in a patient with Crohn's disease. *Gastroenterol Hepatol* 2009;**32**:339–42