Toothpick impaction in a sigmoid diverticulum

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SUMMARY

A 70-year-old woman presented to our emergency department with recurrent episodes of left lower quadrant pain. She subsequently underwent high anterior resection with working diagnosis of acute diverticulitis, but intraoperatively was found to have perforated sigmoid diverticulum due to toothpick impaction. A high index of suspicion is required for diagnosis of toothpick ingestion. Appropriate preoperative investigations such as endoscopy and CT, despite their fairly low sensitivity, should be performed to increase the ability to accurately diagnose this condition and therefore optimise subsequent management.

BACKGROUND

This is the only reported case of toothpick impaction within a sigmoid diverticulum. This case highlights the importance of considering foreign body ingestion in patients with diverticular disease. Failure to recognise this condition may lead to complications such as perforation, abscesses and fistula formation.

CASE PRESENTATION

A 70-year-old woman had four presentations to our emergency department with left lower quadrant abdominal pain and tenderness over the course of 1 month. She had a history of chronic obstructive pulmonary disease requiring steroid inhalers (forced expiratory volume in 1 s: 60%) and mild diverticular disease diagnosed 2 years prior by colonoscopy (performed due to history of colonic polyps), and had been stable with no previous attacks of acute diverticulitis. She had no history of previous abdominal operations.

INVESTIGATIONS

During every presentation, the patient underwent routine blood tests, which were unremarkable except for white blood cells ranging from $12 \times 10^9/L$ to $14 \times 10^9/L$ and C reactive protein of 26 mg/L to 55 mg/L. CT scans of abdomen and pelvis were used for diagnostic work-up of her pain and only revealed acute sigmoid diverticulitis with no evidence of perforation. The scans did not show any evidence of foreign body in the gastrointestinal system.

TREATMENT

She was admitted and treated with intravenous antibiotics with diagnosis of acute uncomplicated diverticulitis and quickly improved. At this stage, the treating team had no suspicion of an ingested foreign body to be the cause of patient's symptoms.

Figure 1 Resected sigmoid colon with toothpick impacted in diverticulum.

Given her multiple presentations, she was offered an anterior resection as a measure to prevent further attacks of acute diverticulitis. She consented to have the operation and opted to have it electively. She was seen by the anaesthetist in preadmission clinic and given an American Association of Anesthesiologists (ASA) score of 3. The procedure was then arranged and performed 2 weeks post her discharge.

OUTCOME AND FOLLOW-UP

Intraoperative and histological examination (see figures 1–3) of the resected sigmoid colon revealed an inflamed diverticulum containing an impacted toothpick causing localised perforation. Our patient made an uncomplicated recovery and is now symptom-free.

Figure 2 Operative specimen of resected sigmoid colon with multiple diverticula and impacted toothpick.

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Figure 3 Fine slice of diverticulum showing disruption of mucosal and muscle layer and presence of granulation tissue (between black arrows).

DISCUSSION

A Medline literature search revealed a total of 137 case reports of toothpick ingestion.^{1 2} The main risk factors for toothpick ingestion include meals containing toothpicks and accompanied by alcoholic beverages, male gender and habit of toothpick chewing.¹ Up to 50% of patients are not aware of toothpick ingestion.^{1 3}

Gastrointestinal perforation occurred in 79% of these cases, and definitive diagnosis was frequently made only at surgery — 53% at laparotomy, followed by 19% at endoscopy.¹ The most common sites of toothpick impaction are the stomach (20%), duodenum (23%) and sigmoid colon (16%).¹

Among diagnostic tests, endoscopy appears to have the highest sensitivity (72.1%). Diagnosis through radiological modalities has differing sensitivities. Ultrasound has a sensitivity of 32.6%, while CT scan has a sensitivity of 42.6%.¹ MRI might also be useful in detecting non-metallic ingested foreign bodies, but its use is limited to cases in which the exact composition of ingested foreign body has been determined.⁴

Toothpick ingestion is an uncommon but potentially fatal cause of acute abdomen. The reported mortality associated with perforation from toothpick ingestion is 9.6%, and of these patients 38% died despite successful removal of the toothpick.¹

Spontaneous elimination is unlikely due to its narrow shape and pointed ends,^{5 6} and consequently the risk of perforation is high. Establishing the diagnosis is difficult, partly due to the low sensitivity of diagnostic investigations but mostly due to the vague and often unelicited history of unintentional ingestion.

Unfortunately, foreign body ingestion was not initially considered in our patient as there was no indication in the history that could potentially raise suspicion. Even postoperatively and on further questioning, the patient denied past toothpick usage and could not recall having a meal served with a toothpick.

Given the difficulty of diagnosis due to unreliable history and poor sensitivity of radiological tests, Steinbach *et al*¹ have designed and recommended a diagnostic and therapeutic

algorithm. Endoscopic retrieval of foreign bodies may be an option in uncomplicated cases.^{3 7}

We believe this is the first case of toothpick impaction in a sigmoid diverticulum causing perforation. Given the sudden onset of worsening symptoms our patient experienced, the low sensitivity of CT scan in detecting toothpick impaction and the intraoperative findings, we strongly suspect the toothpick impaction exacerbated her symptoms.

Impaction and perforation of the bowel from an inadvertently ingested foreign body should be considered in the differential diagnosis of acute or recurrent abdominal pain, even in the absence of known history of foreign body ingestion.⁸

Learning points

- ▶ Foreign body ingestion should remain in the clinician's differential diagnosis list of abdominal pain, regardless of the patient's medical and surgical history.
- ▶ Toothpick impaction can be difficult to diagnose through radiology.
- ▶ Spontaneous passage of a toothpick is unlikely.

Contributors SK undertook the planning and performed literature review and consented the patient. RM undertook literature review, editing and revision of the report. AA undertook planning, provided the images and collaborated with the pathology service. AC performed the operation, and undertook planning and editing of the report.

Competing interests None declared.

Patient consent Obtained.

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