



Case report

Acute complicated appendicitis caused by an ingested toothpick – A case report

A.J. Lloyd^{a,b,*}, S.M. Abd Elwahab^{a,b}, M.R. Boland^{a,b}, A. Elfadul^{a,b}, A.D.K. Hill^{a,b}, C. Power^{a,b}^a Department of Surgery, Beaumont Hospital, Dublin, Ireland^b Department of Surgery, Royal College of Surgeons in Ireland, Dublin, Ireland

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ABSTRACT

Introduction and importance: Acute appendicitis is one of the most common presentations to the emergency department, particularly in young adults. A combination of clinical suspicion, inflammatory blood markers and imaging modalities such as ultrasound and CT are used for its definitive diagnosis. Early detection and intervention are paramount to reduce morbidity and mortality. Laparoscopic appendicectomy is the current gold standard in the management of appendicitis, especially if complicated according to EAES guidelines. There are few documented cases in the literature of acute appendicitis secondary to foreign body ingestion. On account of this, there are currently no guidelines for its management. Our literature review highlights the importance of surgical management of foreign body acute appendicitis.

Case presentation: This case report describes the rare presentation of acute complicated appendicitis caused by an ingested toothpick in a 64 year old woman. The patient was admitted with a 3 day history of lower abdominal pain, localizing to the right iliac fossa with raised inflammatory markers. CT imaging reported acute complicated appendicitis. Laparoscopic appendicectomy was performed during which a toothpick was seen protruding through the appendiceal wall. Post operatively the patient was treated with IV antibiotics for 5 days prior to discharge.

Clinical discussion: Due to the rare nature of foreign body appendicitis there are no specific guidelines on the respective surgical approach. A literature review showed that in the setting of foreign body appendicitis, surgical intervention is paramount with no scope for conservative management.

Conclusion: Surgical approach is based on the clinical judgement and skillset of the operating surgeon.

1. Introduction

Acute appendicitis is one of the most common presentations to the emergency department, particularly in young adults [1]. A combination of clinical suspicion, inflammatory blood markers and imaging modalities such as ultrasound and CT are used for its diagnosis [2]. Early detection and intervention are paramount to reduce morbidity and mortality. Laparoscopic appendicectomy is the gold standard in the management of appendicitis, especially if complicated [3,4]. There is increasing evidence in the literature supporting conservative management through the use of antibiotics for acute uncomplicated appendicitis [5]. Appendicitis is typically caused by a luminal obstruction secondary to a faecolith, lymphoid hyperplasia or neoplasm [6].

There are few documented cases in the literature of acute appendicitis secondary to foreign body ingestion [7–12]. Due to the rare nature

of foreign body appendicitis, there are currently no guidelines for its management. A literature review was performed to identify the optimal surgical management of foreign body appendicitis.

This case report describes a rare presentation of acute complicated appendicitis caused by an ingested toothpick. This work has been reported in line with the SCARE criteria [13].

2. Case presentation

The patient, a 64 year old white woman presented to the emergency department complaining of a 3 day history of lower abdominal pain. The pain was localized to the right lower quadrant and described as dull and persistent in nature, non radiating and increasing in severity. She denied having any associated nausea, vomiting, fevers or altered bowel habit. A past medical history of hypertension was noted, for which the patient

* Corresponding author at: Department of Surgery, Beaumont Hospital, Dublin, Ireland.

E-mail address: anguslloyd@rcsi.ie (A.J. Lloyd).

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took regular losartan. With respect to her surgical history, the patient had undergone a total abdominal hysterectomy (TAH) twenty years prior. She had no significant family history. The patient, a retired teacher, lived at home with her husband and was a lifelong non-smoker.

On examination the patient was vitally stable. Her respiratory rate was 17 breaths/min, oxygen saturation was 97% on room air, heart rate was 92 beats/min, blood pressure of 141/78 mm Hg with a temperature of 36.8 °C. On inspection, there was a midline laparotomy scar from her previous TAH. On palpation there was focal tenderness in the right iliac fossa but the abdomen was soft with no clinical signs of peritonitis. The abdominal exam was otherwise unremarkable.

2.1. Investigations

On admission routine bloods were performed revealing raised inflammatory markers and liver function tests (LFTS's). Laboratory results showed haemoglobin 13.6 g/dL, leukocytes $16.7 \times 10^3/\mu\text{L}$, platelets $246 \times 10^3/\mu\text{L}$, C-reactive protein 251.3 mg/L, bilirubin 18 $\mu\text{mol/L}$, ALT 37iu/L, AST 31iu/L, Alk Phos 206iu/L and GGT 145iu/L. Renal profile and coagulation screen were within normal limits.

A chest x-ray showed no free air below the diaphragm. Plain film of the abdomen revealed no radiographic evidence of obstruction or perforation. The x-rays did not show any evidence of a foreign body.

Computed tomography (CT) of the abdomen and pelvis with IV contrast revealed a phlegmonous process within the right iliac fossa centred on the base and midpoint of the appendix, in keeping with acute complicated appendicitis. There was a radio-opaque object identifiable in the centre of the phlegmonous mass. Additionally, there was marked thickening of the adjacent caecum, that was likely reactive in nature (Figs. 1 and 2). Following the above CT findings, the patient denied any memory of the ingestion of a foreign body.

2.2. Treatment

On admission, the patient was commenced on IV piperacillin and tazobactam as per the local microbiological guidelines. An urgent laparoscopic appendicectomy was performed by the senior specialist registrar and assisted by the consultant. During laparoscopic exploration, a foreign body was seen protruding/perforating from the middle portion of the appendix (Fig. 3). Additionally, the caecum was mildly thickened and inflamed likely due to an inflammatory process secondary to appendiceal perforation.

The foreign body, a 2.3 cm plastic toothpick, was carefully extracted laparoscopically (Fig. 4). Following this the phlegmonous mass was dissected open and appendicectomy performed. The appendiceal resection was done using an Endo-GIA stapler to include a cuff of

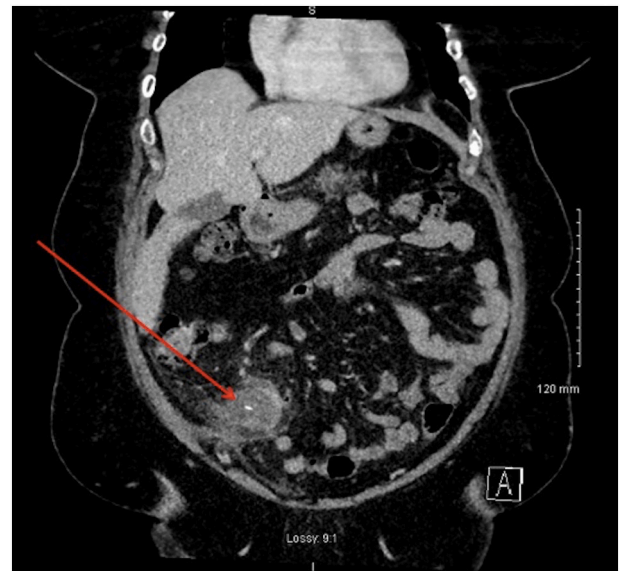


Fig. 2. Coronal cut of CT showing foreign body in phlegmonous mass.



Fig. 3. Foreign body (plastic toothpick) protruding from phlegmonous mass during laparoscopic exploration.



Fig. 1. Transverse cut CT showing foreign body in phlegmonous mass.



Fig. 4. Plastic toothpick measuring 2.3cm following laparoscopic extraction.

caecum. Pus was washed out and sent to the laboratory for culture and sensitivity testing. A 24 french Robinson drain was placed through the supra-umbilical port site into the right iliac fossa.

Post operatively, the patient was continued on IV piperacillin and tazobactam in combination with a stat dose of IV gentamycin. Drain output was monitored closely and physiotherapy was involved in the patient's post operative rehabilitation. Inflammatory markers and drain output reduced gradually post operatively. The drain was removed day four post operatively. The patient recovered well during her inpatient stay and was discharged home five days after laparoscopic appendectomy with appropriate analgesia.

2.3. Outcome and follow up

The patient was followed up six weeks after discharge in outpatient clinic. She had recovered well and had normal blood test results. The patient was happy to have recovered well post operatively and grateful for the care she received as an inpatient.

3. Discussion

This case report describes a rare presentation of acute complicated appendicitis caused by an ingested toothpick in a 64 year old white woman. The patient denies having any memory of ingesting the foreign body and consequently the time from ingestion to onset of symptoms is unknown. However this case demonstrates that ingestion of a foreign body is a rare but known cause of appendicitis which can in some cases be complicated by perforation, abscess or peritonitis. Prompt imaging and diagnosis in addition to urgent laparoscopic intervention resulted in a good outcome for this patient. The patient was discharged home five days after her operation, experienced no post operative complications and is now doing well. The presence of foreign body appendicitis with perforation meant that conservative treatment was not an option in this case.

In the past 5 years (2015 to time of publishing) there have been 13 cases of acute appendicitis secondary to foreign body ingestion reported in the literature [7–9,14–22]. These included 8 men, 2 women and 3 children whilst the average age was 33.6. In 7 cases, acute complicated appendicitis secondary to foreign body ingestion was observed. In the majority of cases of appendiceal perforation (6/7) a sharp foreign body was found within the appendix. In all 13 cases, the patient was managed surgically with 7 appendectomies performed with open technique versus 6 performed laparoscopically. Conservative management with antibiotics was not utilised in any of the reviewed cases.

Appendicitis secondary to an ingested foreign body is extremely rare. Typically, ingested foreign bodies spontaneously pass through the gastrointestinal tract within one week with the rate of complication less than 1% [23]. The estimated rate of foreign bodies in the appendix at appendectomy is estimated to be 0.0005% [23,24]. Entry of a foreign body into the appendix depends on the size of its orifice but also on the anatomical position of the appendix. For instance it is not possible for a foreign body to enter a retroceally positioned appendix [23]. If heavier than faecal matter, gravity can bring the foreign body closer to the appendiceal orifice once within the caecum. When the foreign body has entered the appendix, the peristaltic motion required to expel it back into the caecum is absent. An inflammatory process or reaction is not always instantly initiated and therefore the time from ingestion to onset of symptoms can vary from hours to years. Subsequently, symptom onset is often dependent on the size and shape of the foreign body, with a sharper and more elongated object more likely to cause perforations, abscesses and peritonitis, as well as presenting earlier in comparison to blunt objects [23,25,26]. These foreign bodies are nearly always radiopaque [23].

Conservative management with antibiotics of uncomplicated appendicitis has been associated with reduced complication rates and hospitalisation stays [27]. The current EAES guidelines state that

appendectomy is the gold standard in the management of both uncomplicated and complicated acute appendicitis [4]. As shown in the aforementioned 13 documented cases of foreign body appendicitis, surgical intervention to remove the foreign body is paramount with no scope for conservative management.

Of the 14 cases (including this case) of acute appendicitis secondary to foreign body ingestion, 50% of appendectomies were performed using laparoscopic technique versus open technique. Additionally, there was no difference in approach even within the acute complicated appendicitis subgroup, where laparoscopic technique was again used in 50% of cases (4/8). Laparoscopic appendectomies are associated with reduced post-operative complications, shorter post-operative hospital stays, earlier return to normal activity but a longer operation time [28]. However, due to the rare nature of acute appendicitis secondary to foreign body ingestion there are no specific guidelines on the respective surgical approach. Therefore it is likely that surgical approach is based on the clinical judgement and skillset of the operating surgeon.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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We have reported a case report with no requirement for ethical approval.

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Credit authorship contribution statement

All authors were involved in the writing of this case report and additionally in the patient's management.

Declaration of competing interest

The authors report no conflicts of interest.

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