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Terminal ileostomy and on-table enteroscopy—A case report describing a novel approach for retrieval of foreign bodies in the difficult abdomen

Shadi Al-Bahri, Esther Cha, Gregory Burgoyne*

Department of Surgery, MedStar Union Memorial Hospital, Baltimore, MD, United States

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ABSTRACT

INTRODUCTION: With any abdominal surgery in a difficult abdomen, the procedure is filled with potential hazards. In addition to a prolonged operative time, there is a risk of enterotomy or damage to blood vessels and ureters. An irradiated pelvis increases this risk and may cause additional morbidity such as delayed healing. An impacted foreign body can also be a challenging problem to deal with alone but when combined with a difficult abdomen can make the problem impossible.

PRESENTATION OF CASE: A 67 year-old male presented with a small bowel obstruction secondary to a foreign body impacted in the distal. The patient had a history of prostate cancer with radiation to the pelvis and thereafter developed perforated diverticulitis, requiring end colostomy. Later he underwent a colostomy take-down but developed wound infection and dehiscence resulting in an incisional hernia which was repaired. The patient failed conservative management and operative intervention was undertaken. Due to the extensive scarring of his midline abdomen, a right sided transverse incision was used. An enterotomy was made in the terminal ileum allowing the endoscope to advance to the foreign body to be retrieved with a snare. The foreign body was found to be a 3.5 cm piece of bone. Post-operative course was unremarkable.

DISCUSSION: Foreign body ingestion is a rare cause of small bowel obstruction, and exploration and retrieval is recommended if the obstruction does not resolve or if the bowels perforate. The method of retrieval depends on the site of the foreign body. Fortunately, in the small bowel, the terminal ileum is the narrowest part and most likely the site of impaction. Operative retrieval is easier if there are no prior abdominal interventions. An irradiated pelvis or abdomen, multiple prior procedures and a frozen abdomen warrant an alternative approach. As it can be difficult or impossible to access the ileum using a colonoscope transanally, a limited right-sided transverse incision can be employed allowing immediate access to the cecum and terminal ileum through which endoscopic retrieval could be performed. A review of the literature to date did not yield any other descriptions of this approach for foreign body retrieval, however, an appendostomy and endoscopy to rule out malignancy in patients with right sided diverticulitis has been documented.

CONCLUSION: Consideration should be given to foreign body retrieval through an appendostomy or ileostomy if a midline laparotomy is considered too high risk in the setting of pelvic irradiation and multiple prior abdominal surgeries.

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1. Introduction

Ingestion of foreign objects is well documented in the pediatric literature. However, it is not an uncommon occurrence in adults. Most of these foreign objects are toothpicks or other dietary foreign objects such as fish bones or other bone fragments [1]. Commonly,

an aggressive surgical intervention is not required as most foreign objects will pass through the gastrointestinal tract without causing serious injury [2]. Occasionally, objects do not pass spontaneously or present with bowel obstruction not responding to conservative management. In such situations, surgical intervention may be necessary to alleviate the obstruction, particularly if there are signs of impending bowel perforation. In addition, abdominal surgery in the difficult abdomen with multiple previous laparotomies can be hazardous. Potential complications include prolonged operative time, increased risk of enterotomies and possible subsequent enterocutaneous fistula formation or damage to surrounding structures.

* Corresponding author at: MedStar Union Memorial Hospital, Baltimore, MD 21218, United States.

E-mail address: Gregory.burgoyne@medstar.net (G. Burgoyne).

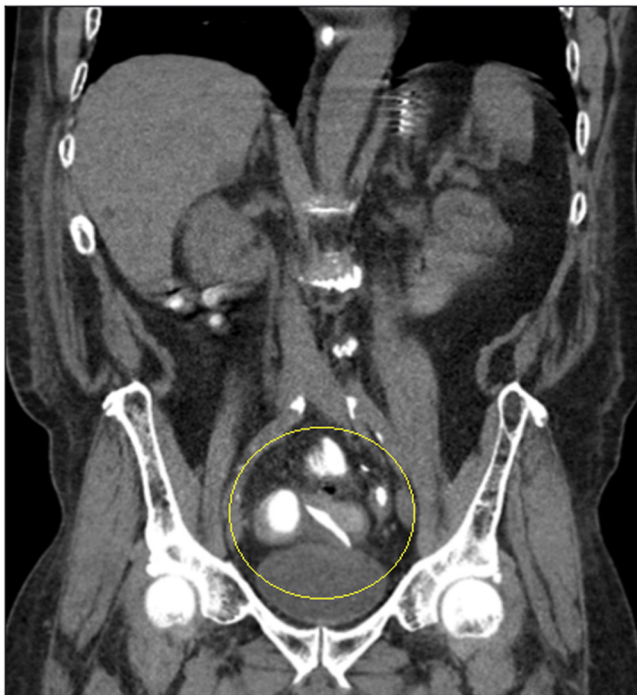


Fig. 1. Coronal view of the CT scan imaging study showing the impacted radio-opaque foreign body impacted in the distal ileum superior to the bladder at the midline.

Furthermore, an irradiated pelvis increases this risk and may cause additional morbidity such as delayed healing. This manuscript has been reported in accordance with the SCARE criteria [3].

2. Case presentation

A 67 year-old male with a history of prostate cancer with pelvic radiation, perforated diverticulitis managed with an end colostomy complicated by wound infection and dehiscence requiring urgent laparotomy and resulting in an incisional hernia presented to our emergency room with nausea, vomiting and diffuse abdominal pain. Computed tomographic imaging revealed small bowel obstruction associated with foreign body impaction in the distal ileum 20 cm proximal to the ileocecal valve (Fig. 1). He was admitted and subsequently failed conservative management with nasogastric suction, nil per os and intravenous hydration. Repeat imaging showed lack of progression of the foreign body with unchanged bowel pattern consistent with small bowel obstruction five days later. The operative plan was discussed with the patient and the patient was taken to the operating room. Due to the extensive scarring of his midline abdomen, a right-sided transverse incision was utilized to enter the abdomen. An appendectomy was performed to avoid return into the abdomen. An attempt was made to insert the colonoscope through the appendostomy, but was unsuccessful due to the acute angulation between the appendiceal orifice and the ileocecal valve due to significant adhesions and the inherent presence of the ileocecal valve. An enterotomy was then made in the terminal ileum and the endoscope was advanced approximately 20 cm in to the distal ileum where the foreign body was visualized. Localized mucosal ulceration was noted at the impaction, and the foreign body was dislodged and retrieved with a snare (Fig. 2). The foreign body was found to be a 3.5 cm ingested bone fragment, likely a portion of porcine rib (Fig. 3). There was no evidence of perforation upon endoscopic re-evaluation of the mucosa. The enterotomy was closed in a running fashion without constriction of the bowel lumen. The patient tolerated the proce-



Fig. 2. Endoscopic image showing the impacted foreign body and surrounding mucosal ulceration.

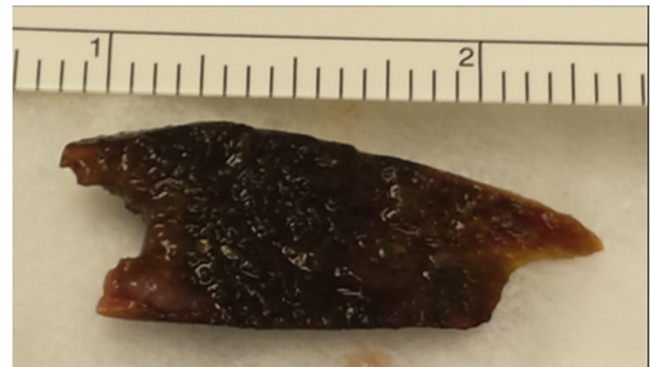


Fig. 3. Gross image depicting the foreign body as a portion of bone measuring 3.5 cm in length with sharp edges allowing the object to adhere to the opposite sides of the bowel lumen.

cedure well, and diet was resumed upon return of bowel function. Patient had an uneventful post-operative recovery and was ultimately discharged on post-operative day 5.

3. Discussion

Foreign body ingestion is a rare cause of small bowel obstruction. Exploration and retrieval is recommended if the obstruction does not resolve or if the patient presents with bowel perforation or peritonitis [4]. Foreign objects that have passed through the stomach commonly fail to progress near the terminal ileum [5], which is the narrowest portion of the small intestine. Therefore, all sharp objects and offending agents with potential to perforate should be removed. The method of retrieval depends on the site of foreign body impaction. Endoscopic interventions are commonly used in the retrieval of ingested objects. Upper rigid or flexible endoscopy can be used for objects impacted in the cervical esophagus and up to the distal duodenum. Colonoscopy can be used for colonic foreign bodies [6]. Laparoscopic retrieval of various foreign objects has also been reported, including the removal of a spoon and needle from the pelvis [7,8]. Operative retrieval is easier if there are no prior abdominal interventions. An irradiated pelvis or abdomen as well as multiple prior procedures warrant consideration of an alternate approach. Our patient had a history of multiple gastrointestinal operations as well as pelvic radiation making the operative retrieval much more difficult. Review of prior operative records

indicated the presence of a frozen abdomen with malignant adhesions resulting in multiple enterotomies previously. Complicating the clinical picture was the location of the object in the terminal ileum. Since it may be difficult or impossible to access the ileum using a colonoscope while maneuvering through the ileum in the setting of dense adhesions, a limited right-sided transverse incision can be employed through virgin territory allowing immediate access to the cecum and terminal ileum through which endoscopic retrieval could be performed. A review of the literature to date did not yield any other descriptions of this approach for foreign body retrieval, however, an appendostomy and endoscopy to rule out malignancy in patients with right-sided diverticulitis has been documented. Chiu et al. successfully used an on-table cecoscopy to diagnose acute diverticulitis of right colon while evaluating for carcinoma [9].

4. Conclusion

Endoscopy remains the mainstay of treatment in the removal of foreign bodies of the esophagus, stomach and duodenum as well as the colon. Laparoscopy is also commonly being performed for removal of impacted foreign bodies throughout the gastrointestinal tract not amenable to endoscopic removal. However, we believe a hybrid limited open and endoscopic technique is warranted in such cases where a laparoscopic approach cannot be performed, and when a midline laparotomy risks enterotomies and further complications. Consideration should therefore be given to foreign body retrieval through an appendostomy or terminal ileostomy followed by small bowel endoscopy to allow manual manipulation of the endoscope to the target site.

Setting

Community hospital setting.

Conflict of interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

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Ethical approval

Approval given by the Ethics committee at MedStar Union Memorial Hospital, Baltimore, Maryland, United States – 3333N, Calvert Street, Office 440 Johnston Professional Building.

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.

Author contribution

Dr. Gregory Burgoyne: Attending surgeon, co-author.
Dr. Shadi Al-Bahri: Assisting surgeon, co-author – case presentation.
Dr. Esther Cha: literature review.

Guarantor

Dr. Gregory Burgoyne.

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