

Foreign Body Penetration through Jejunal Loops Causing Renal Artery Thrombosis and Renal Infarct

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ABSTRACT

Foreign body ingestion is common, although perforation after ingestion is rare. We report a case of an ingested sharp wooden stick that perforated the proximal jejunum toward the renal vasculature, causing segmental renal artery thrombosis and renal infarct. The patient presented with severe abdominal pain and vomiting. A computed tomography scan revealed a linear opacity corresponding to the foreign body. The wooden stick was removed endoscopically through deep-push enteroscopy with a rat-tooth forceps. We report this unique case of perforation by a foreign body through the proximal jejunum to the left kidney, which was managed endoscopically.

INTRODUCTION

Foreign body ingestion is common. Risk factors include advanced age, altered capability to form food bolus, wearing of dentures, mental disorders, bulimia, certain professions (eg, carpenters, dressmakers), and alcohol consumption. In most cases, the foreign body passes through the gastrointestinal (GI) tract without perforation.^{1,2} Perforation is more common with sharp or elongated objects, which are more likely to become lodged in areas of narrow lumen or angulation in the bowel, such as the distal ileum, ileocecal valve, or rectosigmoid junction, which are more susceptible to injury or perforation.³⁻⁶ GI perforation by a foreign body classically presents as acute abdominal pain. Patients can, however, be completely asymptomatic or can develop only local infection or abscess, generalized peritonitis or even death.^{4,6} Thus, foreign body ingestion represents an important clinical emergency that requires early clinical suspicion and workup given its significant morbidity and mortality.⁷

CASE REPORT

A 38-year-old previously healthy African American woman presented to the emergency department with a 3-day history of increasing severe left upper quadrant (LUQ) pain radiating to the left flank with fever and persistent vomiting. The patient had no diarrhea, constipation, or bloody stools. Fever and LUQ tenderness were noted on exam. She had normal white blood cell count, mildly elevated liver enzymes, and normal creatinine, lipase, and lactic acid. Urinalysis showed no leukocytes, no red blood cells, negative nitrites, and trace protein. Abdominal computed tomography (CT) of the abdomen revealed a 3-cm linear radiopaque density within the jejunum that appeared to perforate the posterior wall of the small bowel and point toward the renal pelvis with an adjacent inflammation (Figure 1). No intra-abdominal free air was visualized.

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Figure 1. Abdominal CT showing a linear opacity corresponding to the foreign body (arrow).

The patient was put on antibiotics. On day 2, she had worsening abdominal pain. Repeat abdominal CT with contrast showed renal infarct to the left lower pole (Figure 2). CT angiogram detected left segmental renal artery thrombosis (Figure 3). After a negative workup for secondary causes of renal infarct, including atrial fibrillation, vasculitis, hypercoagulability, endocarditis, and drugs, the foreign body was identified as the cause. An upper deep-push enteroscopy using a pediatric endoscope revealed a 2.5 x 0.1 cm linear fragment of wood with a sharp tip perforating the proximal jejunum (Figure 4). The fragment was removed intact with rat-tooth forceps. Examination of the microscopic penetration site using contrast injection under endoscopic and fluoroscopic guidance revealed no perforation or leak of contrast. The patient recalled eating a meal prepared in a hand-made

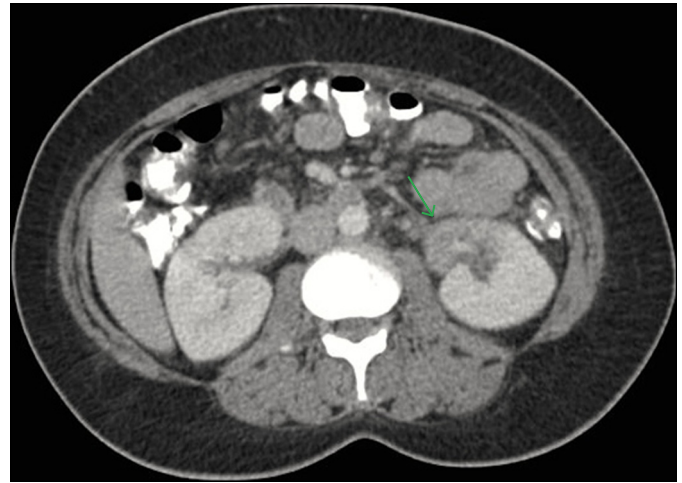


Figure 2. Abdominal CT scan with intravenous and oral contrast showing the renal infarct to the left lower pole (arrow).

wooden plate overseas. After endoscopic retrieval, patient's symptoms improved dramatically.

DISCUSSION

Management of foreign body perforation depends on the nature, shape, size, number, and location of the foreign bodies.⁵ Endoscopic removal of the foreign body in the upper GI tract is required in 10–20% of cases, and approximately 1% of these cases are surgical.⁸ Endoscopy may be utilized to aid in the diagnosis of the symptoms caused by foreign body ingestion, and endoscopic retrieval is often successful following known ingestion, especially if the foreign body is localized in the proximal GI tract.⁹ In this case, the foreign body perforated the jejunal loops and penetrated toward the renal vasculature, likely inducing an inflammatory response secondary to the mechanical trauma. Anatomically, the medial area of the left kidney is in close juxtaposition to the intraperitoneal



Figure 3. CT angiogram showing the left subsegmental renal artery thrombosis (arrow).

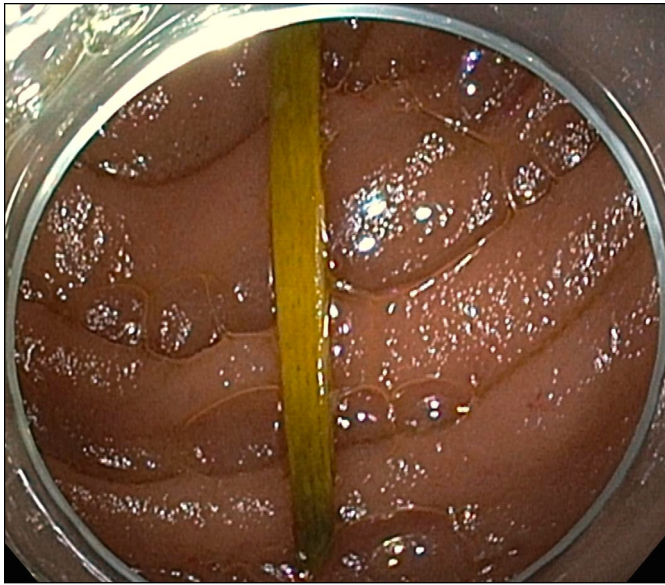


Figure 4. Endoscopic view of a 2.5 x 0.1-cm wooden stick in the proximal jejunum.

loops of the jejunum. No free air was seen on imaging, likely because perforation by a foreign body is a gradual process, which allows the perforation site to seal and be covered by fibrin, omentum, or adjacent loops and prevents an air leak in the peritoneum.¹⁰ Thus, the absence of free air on the CT scan cannot exclude perforation. A noninvasive approach to retrieve the foreign body endoscopically was indicated given that part of the foreign body was intraluminal. During endoscopy, the foreign body was found to be entirely in the jejunal lumen with a proximal area of ulceration. It is likely that the foreign body fell back into the bowel lumen after perforating.

Few reports have discussed the therapeutic role of endoscopy in small bowel foreign body treatment.¹¹⁻¹³ This case adds evidence to the value of therapeutic endoscopy in managing foreign bodies in the small bowel in the setting of perforation. To our knowledge this is the first case described of a foreign body perforating through the jejunal loops and causing renal artery thrombosis and renal infarct, which was managed endoscopically.

DISCLOSURES

Author contributions: All authors participated equally in writing the case report. S. Andrawes is the article guarantor.

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Informed consent was obtained for this case report.

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