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CASE REPORT | ENDOSCOPY

Endoscopic Ultrasound-Guided Drainage of Intramural Duodenal Abscess Caused by Foreign Body Ingestion

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ABSTRACT

A 63-year-old man presented with fever and generalized weakness for 2 days. Computed tomography scan showed an intramural duodenal abscess and a linear radiolucent foreign body penetrating the duodenal wall. Endoscopic drainage was performed. Endoscopic ultrasound showed fluid collection in the second portion of the duodenum. The duodenal lumen was punctured with the creation of stoma using a lumen-apposing metal stent and electrocautery system. The stent was deployed, and the drainage of purulent fluid followed. The foreign body was suspected to be a wire brush bristle. The patient received intravenous antibiotics for 14 days. Follow-up images showed the resolution of the abscess.

INTRODUCTION

Traditionally, intra-abdominal abscesses have been managed by percutaneous or surgical drainage. Image-guided percutaneous drainage is a less invasive method when compared with open surgery, which is reserved as a last resort. Although the endoscopic ultrasound (EUS)-guided lumen-apposing metal stent (LAMS) system was originally invented for the drainage of transmural pancreatic fluid collection (PFC), there have been reports of its use for many off-label indications. We present a patient who underwent EUS-guided LAMS for the management of a duodenal abscess after unintentionally ingesting a foreign body.

CASE REPORT

A 63-year-old man with a history of parotid cancer in clinical remission, diabetes mellitus, and nonalcoholic steatohepatitis presented to the emergency department with 2 days of intermittent fever, rigors, and generalized weakness. The patient denied any abdominal pain, nausea, vomiting, dyspnea, dysuria, weight, or bowel habit changes. No history of pancreatitis, chronic kidney disease, significant alcohol use, recent travels, or ill contacts. Physical examination showed an overweight man, febrile with a temperature of 103°F, blood pressure of 110/54 mm Hg, and heart rate of 108 bpm. The abdomen was nondistended, soft, and nontender in all 4 quadrants, with normal bowel sounds and no organomegaly. Pertinent laboratory findings included leukocytosis of 14, lactate of 4 mg/dL, blood urea nitrogen of 33 mg/dL, creatinine of 2.9 mg/dL, albumin of 3.1 g/dL, aspartate aminotransferase of 133 IU/L, alanine aminotransferase of 94 IU/L, alkaline phosphatase of 78 IU/L, direct bilirubin of 0.4 mg/dL, lipase of 237 U/L, prothrombin time of 12.7 seconds, and international normalized ratio of 1.2. Urinalysis was normal. Abdominal ultrasound showed a heterogeneous liver without any gallstones, cholecystitis, or biliary duct abnormalities.

Abdominal and pelvic computed tomography without contrast demonstrated duodenal inflammation with concentric wall thickening in the duodenal bulb, adjacent fat stranding, and a fluid collection that measured 3.5 × 3.2 cm, consistent with an intramural duodenal abscess (Figure 1). In addition, a linear radiolucent foreign body was identified. This was later discovered to be a wire brush bristle that the patient unintentionally swallowed weeks before the onset of symptoms. Blood cultures were obtained. The patient was treated with intravenous antibiotics. Endoscopic drainage was chosen as the method of therapy. Esophagogastroduodenoscopy showed multiple

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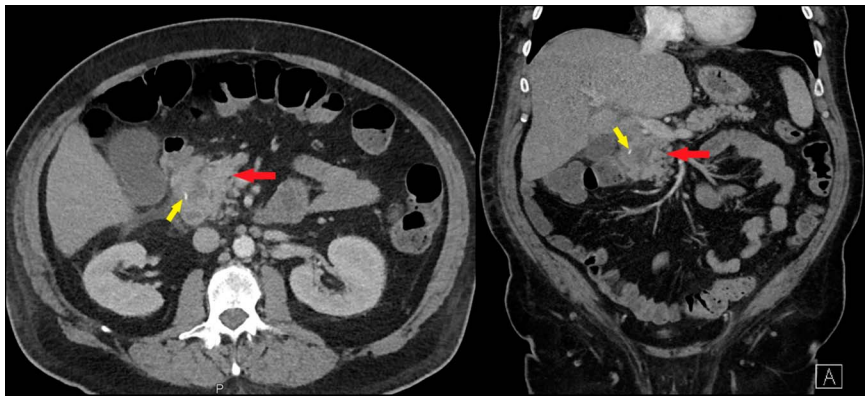

Figure 1. Axial and coronal views of abdominal and pelvic computed tomography without contrast showing an intramural duodenal fluid collection measuring 3.5 × 3.2 cm (red arrow). A linear radiolucent foreign body penetrating the duodenal wall (yellow arrow).

nonbleeding superficial duodenal ulcers in the duodenal bulb without stigmata, and biopsies showed duodenitis without ulceration. EUS showed a fluid collection of 4 × 2.4 cm, with a heterogeneous thick-walled structure and mobile internal debris in the retroperitoneum at the second portion of the duodenum (Figure 2).

A decision was made to create a cystoduodenostomy using LAMS. The common wall between the duodenum and the cyst was interrogated using color Doppler imaging to identify interposed vessels. The duodenal wall and cyst were punctured under EUS-guided LAMS with electrocautery-enhanced delivery system, creating a stoma. A 15 × 10 mm LAMS was deployed into the walls of the cyst and the duodenum through the cystoduodenostomy (Figure 3). Rapid drainage of purulent fluid was noted on the placement of the stent. The metallic bristle was identified and safely removed.

Blood cultures were positive for *Streptococcus anginosus* group F and *Veillonella* species sensitive to ceftriaxone. The patient clinically improved, and his abnormal laboratory findings normalized. His transient elevated liver enzymes and renal function were suspected to be related to sepsis. The patient was discharged and completed 14 days of ceftriaxone at an outpatient infusion center. The one-week follow-up abdominal and pelvic computed tomography showed complete resolution of the abscess. Follow-up esophagogastroduodenoscopy 1 week later showed no purulent discharge, debris, or bleeding in the cavity through the stent lumen. The stent was removed without complications.

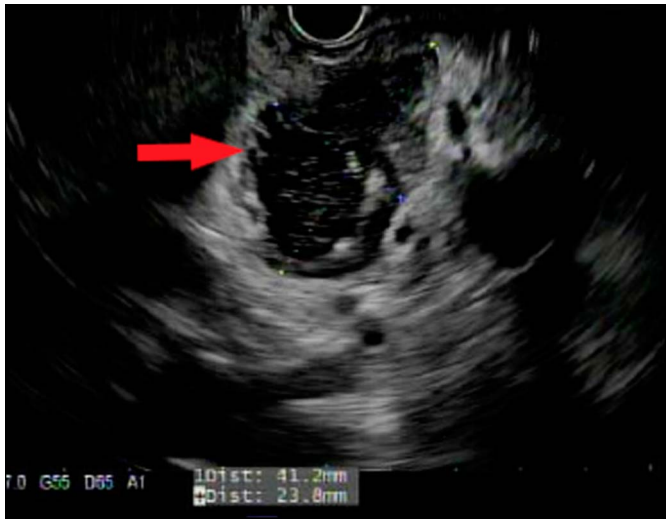

Figure 2. Endoscopic ultrasound image showing a retroperitoneal fluid collection of 4 × 2.4 cm with heterogeneous thick-walled structure and mobile internal debris at the second portion of the duodenum (red arrow).

DISCUSSION

Duodenal abscesses are mostly caused by complications from duodenal ulcer perforation. Only a small percentage of duodenal abscesses are because of a foreign body. Ingestion of sharp foreign bodies may occasionally penetrate segments of the gastrointestinal system.[1] Owing to its vague clinical presentation, this disorder is best managed by an interdisciplinary team including radiology, gastroenterology, and surgery.[2] LAMS were created for pancreatic fluid collection drainage such as from pancreatic pseudocysts and walled off pancreatic necrosis; however, they are currently being used for a plethora of off-label indications.[3] These include gallbladder drainage, bile duct drainage, enteroenteric anastomoses, gastrointestinal strictures, and transgastric ERCP in patients with bypass surgery.[3,4]

LAMS' wide diameter facilitates the drainage of fluid collections and allows the passage of the endoscope directly through the stent for inspection and removal of solid material.[5] The addition of the electrocautery-enhanced delivery system, also referred to as "Hot Axios," allows the creation of a fistula tract by using an electrocautery device on the tip of the stent catheter and release of the stent in a single-step procedure.[6] Although surgery is highly effective, it is a more invasive approach and is associated with higher rates of morbidity and mortality, prolonged hospital stays, and sometimes requires follow-up interventions.[3] Studies have favored endoscopic drainage over surgical techniques for the management of PFC because it is less expensive, associated with shorter hospital stay, and has similar clinical outcomes.[7]

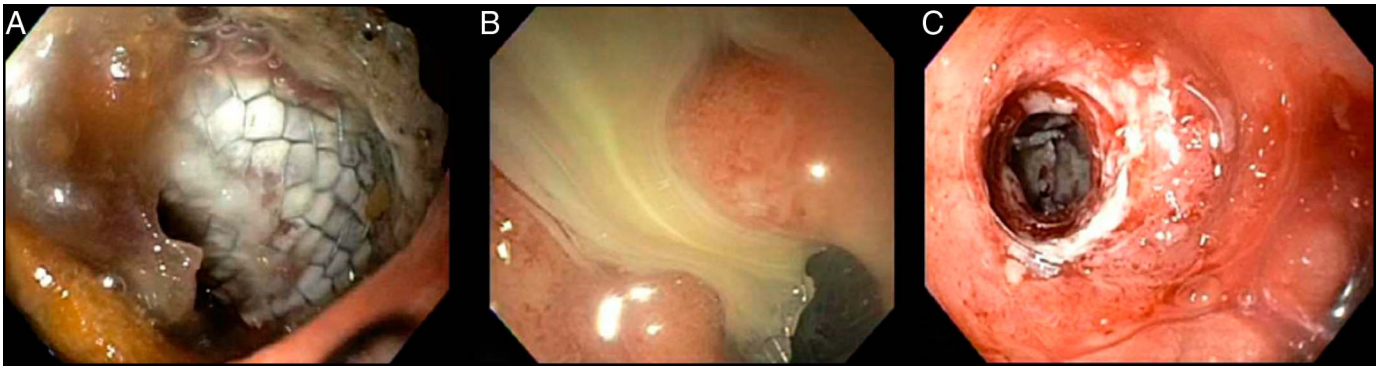

Figure 3. Endoscopic images showing (A) the creation of cystoduodenostomy with the placement of a lumen-apposing metal stent, (B) drainage of purulent fluid, and (C) cystoduodenostomy after the removal of stent.

Complications to consider when placing a LAMS include bleeding, stent migration, stent occlusion, and perforation.[6] However, LAMS' wide diameter reduces the risks of stent occlusion and its dumbbell-shaped design decreases the risks for stent migration. For PFC treated with LAMS, a follow-up computed tomography scan is recommended at 2–3 weeks to assess treatment response. If there is a resolution of the PFC, the LAMS may be removed.[5] If a foreign body is present, its removal may be required with a careful search for the site of perforation.[3] If the patient fails to improve within 24–48 hours after percutaneous drainage or LAMS drainages approach, general surgery consultation may be required.[8]

DISCLOSURES

Author contributions: J. Ricardo wrote the manuscript, reviewed the literature, and is the article guarantor. T. Alkayali, A. Wojtkowski, K. Busari, H. Okanobo, and S. Kucera reviewed and edited the manuscript.

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