

# Bezoar in a Periapillary Duodenal Diverticulum Causing Pancreatobiliary Obstruction

by Javier Rivera, Paul Klepchick, Deepti Dhavaleshwar

In this case, we report a bezoar filling a duodenal diverticulum causing obstruction of the pancreatobiliary tree in a patient presenting with severe epigastric pain. Duodenal diverticula are typically asymptomatic outpouchings that form due to chronic duodenal ulcers or laxity of the bowel wall around the ampulla. When symptomatic, patients usually present with abdominal pain caused by duodenitis. People with gastroparesis, prior gastric surgery or a large diverticulum are at increased risk of forming a bezoar that can lead to gastric, small bowel, biliary or pancreatic duct obstruction. In a patient presenting with epigastric pain, laboratory results and cross sectional imaging are the quickest and easiest way to help make the diagnosis of an obstructing bezoar. Treatment options include conservative management, endoscopy or surgical removal of the obstructing mass.

## HISTORY OF PRESENT ILLNESS AND LABS

**A** 56 year old female with a 40 pack-year smoking history and a past medical and surgical history of depression, appendectomy and cholecystectomy presented with abdominal pain and 3-4 episodes of nonbloody and nonbilious emesis. She was hospitalized 3 times over the course of 3 weeks for pancreatitis at an outside hospital. Outside images were not available, however, a magnetic resonance cholangiopancreatography (MRCP) performed one month prior to the current presentation reported extrahepatic and intrahepatic ductal dilation, without choledocholithiasis. A planned endoscopic retrograde cholangiopancreatography (ERCP) was

cancelled at the patient's discretion. A chest computed tomography angiogram (CTA) was performed on a prior hospitalization due to symptoms related to congestive heart failure or possible pulmonary embolus. The CTA reported no pulmonary embolus; however, it did report small bilateral pleural effusions, bibasilar atelectasis and moderate emphysema. On the current admission, her symptoms included sharp and constant epigastric pain radiating to her back, rated 10/10 that was relieved by narcotics. She denied fevers and abnormal bowel movements. Vital signs at presentation were: temperature 37.1, heart rate of 75 bpm, blood pressure of 117/67 mmHg, respiratory rate 17, oxygen saturation 97% on room air. Physical exam revealed a neurologically intact, slightly jaundiced female in mild discomfort. The abdomen was non-distended and bowel sounds were noted in all four quadrants. The abdomen was tender in the epigastric region to light and deep palpation. No rebound tenderness was

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noted, nor ascites, palpable mass or costovertebral angle (CVA) tenderness. Laboratory findings include alanine aminotransferase level of 472 U/L, alkaline phosphatase level of 832 U/L, aspartate aminotransferase level of 275 U/L, lipase level of 1461 U/L, total bilirubin level of 2.9, WBC level of 12.2 k/mcL.

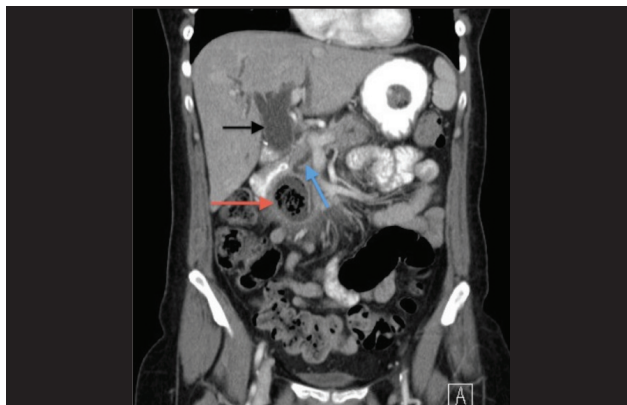
A CT scan of the abdomen and pelvis was performed and the patient was referred to the gastroenterology service. The patient was given one dose of 400mg ciprofloxacin and 500mg of flagyl in the emergency department due to the mildly elevated white blood cell count and was continued on the same antibiotic regimen when admitted. She was placed on narcotics and antiemetics and was scheduled for an ERCP.

### Radiographic and ERCP findings

The CT scan showed an obstructing bezoar within a 4.0 x 3.7 cm periampullary diverticulum causing severe intrahepatic and extrahepatic biliary dilatation, pancreatic duct dilatation and mild fat stranding surrounding the pancreatic head (Figures 1-2). Differential diagnosis included duodenal diverticulitis/abscess or obstructing malignancy.

The ERCP showed two diverticula at the major papilla. The papilla was at the rim of a single diverticulum, which was ulcerated and impacted with solid food (Figure 3). The majority of the food was removed using a tripod and multiple flushes through a cannula. After clearance of the bezoar, a gush of bile followed the relief of the obstruction. Sphincterotomy was not performed due to the edema caused by the bezoar. The patient improved after treatment.

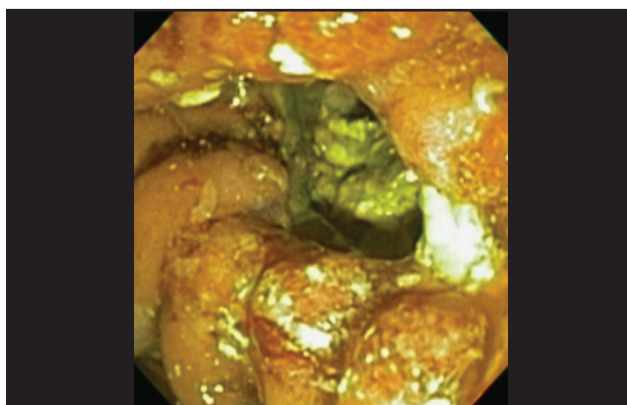
A follow up ERCP was done at 5 weeks. A single peri-ampullary diverticulum with a small opening was found at the major papilla, without evidence of bezoar impaction. The biliary duct was cannulated with a 44 sphincterotome. Severe, diffuse dilation of the biliary tree was present, with the CBD measuring 15mm. A balloon sweep of the CBD was performed using a 15-18mm balloon, without evidence of stones, sludge or debris. An endoscopic ultrasound (EUS) was also performed at this time, which revealed a normal pancreas and pancreatic duct, with no evidence of divisum. Follow up laboratory values also improved. Alanine aminotransferase level of 14 U/L, alkaline phosphatase level of 115 U/L, aspartate aminotransferase level of 18 U/L, lipase level of 85 U/L, total bilirubin level of 0.3, WBC level of 10 k/mcL.



**Figure 1.** Coronal view of bezoar. Coronal CT image with oral and IV contrast demonstrating the duodenal diverticular bezoar (red arrow) causing obstruction/dilatation of the common bile duct (black arrow) and main pancreatic duct (blue arrow).



**Figure 2.** Axial view of bezoar. Axial CT image with oral and IV contrast demonstrating the duodenal diverticular bezoar (red arrow).



**Figure 3.** Endoscopy. Endoscopic image demonstrating duodenal diverticula with partially cleared, soft bezoar.

# Bezoar in a Periapillary Duodenal Diverticulum Causing Pancreatobiliary Obstruction

## A CASE REPORT

### DIAGNOSIS

Periapillary duodenal diverticulum with bezoar causing pancreatobiliary obstruction.

### DISCUSSION

The most common causes of biliary obstruction is a common bile duct stone. Other causes include pancreatic carcinoma, cholangiocarcinoma, stricture of the CBD, infection or recent instrumentation.

A search of the current literature<sup>3-6</sup> revealed that bezoars are uncommon sources of bowel obstruction, and are more rare causes of pancreatobiliary obstruction and acute pancreatitis. A bezoar is an indigestible mass that commonly develops in the stomach; however, they can also form in the small bowel. Categories of bezoars include phytobezoar, made predominantly of plant matter; lactobezoar, made of undigestible milk; pharmacobezoars, made of medications; and trichobezoars, found in people with tricotillomania who present with an obstructing conglomeration of hair in Repunzel syndrome. People with prior gastric surgery and gastroparesis are at increased risk of bezoar formation.<sup>5</sup> Surgeries that bypass the pylorus may cause large food boluses to enter the small bowel, which could potentially cause small bowel obstruction. Stasis of foodstuff in the stomach, or in this case, a diverticulum, may also predispose people to forming bezoars and obstruction. Treatment of bezoars in the stomach and duodenum include ERCP or surgery, if the bezoar cannot be removed with a net or basket. If the bezoar is causing a small bowel obstruction, patients are managed surgically with enterotomy.

A recent case report described bezoar-induced pancreatitis secondary to a bezoar in a periampullary diverticulum, however there was no biliary obstruction.<sup>7</sup>

A periampullary diverticulum contains or is adjacent to ampulla of Vater, while a juxtapapillary diverticulum originates within 2cm from the papilla. Diverticula may form due to wall weakness where the common bile duct (CBD) and pancreatic duct (PD) attach to the duodenum or with increasing age. Duodenal diverticula are typically asymptomatic, and are found incidentally in 6% of Upper GI studies and up to 23% at autopsy.<sup>1</sup> They can, however, cause sphincter of oddi incompetence, abdominal pain, jaundice, bleeding, biliary stones, diverticulitis, perforation and pancreatic or CBD obstruction. In our case, the diverticulum filled with a food bolus. Cross sectional imaging with oral and intravenous contrast has helped in the detection of

air fluid levels within the diverticulum, identifying the diverticular neck and sequela of possible obstruction of the small bowel or pancreatobiliary system.<sup>7</sup>

Treatments of periampullary diverticula include conservative management, endoscopy or surgical removal. ■

### References

- 1 Lobo, DN et al. Periapillary diverticula and pancreaticobiliary disease. *British Journal of Surgery*, 1999; 86:588-597.
- 2 Tyagi, P et al. Periapillary diverticula and technical success of endoscopic retrograde cholangiopancreatography. *Surgical Endoscopy*, 2009; 23:1342-1345.
- 3 Pergel, A et al. Laparoscopic treatment of a phytobezoar in the duodenal diverticulum. *International Journal of Surgery Case Reports*, 2012; 3:392-194
- 4 Kua, Jeh et al. Periapillary Diverticulum: A case of bleeding from Periapillary diverticula. *Annals of Academic Medicine Singapore*, 2005; 34:636-638.
- 5 Erzurumlu K et al. Gastrointestinal bezoars: A retrospective analysis of 34 cases. *World Journal of Gastroenterology*, 2005;11(12):1813-1817.
- 6 Kim, JH et al. Duodenal obstruction following acute pancreatitis caused by a large duodenal diverticular bezoar. *World Journal of Gastroenterology*, 2012; 18(38):5485-5488
- 7 Perdikakis E et al. Diagnosis of periampullary duodenal diverticula: the value of new imaging techniques. *Annals of Gastroenterology*, 2011; 24(3): 192-199.

### Answers to this month's crossword puzzle:

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