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Harpoon extraction of a common bile duct stone impacted at the ampulla of Vater with needle-knife sphincterotome.

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was observed in the duodenal bulb seen through the pylorus. The bezoar had the Fabergé egg appearance of the Perdiem bezoar seen in the previous patient. Biopsy specimens of the antral mass revealed acute and chronic inflammation. Brush cytologic findings of the mass were also negative for malignancy. Exploratory laparotomy was performed because of the suspicion of malignancy. Vagotomy and antrectomy were performed, with the removal of the antral mass that measured 3 × 3 cm. A histologic analysis of the mass showed chronic inflammation without any evidence of malignancy. The postoperative course was unremarkable, and the patient was discharged after 8 days. The Perdiem was stopped, and at the 4-month follow-up the patient was doing well.

Medication bezoars are unusual in the UGI tract. Review of the literature reveals four cases of esophageal obstruction caused by sucralfate, the aluminum salt of sucrose octasulfate.^{2,4-6} In three of these case reports, sucralfate had been given by way of a nasogastric tube in combination with other medications and enteral feedings.⁴⁻⁶ In the fourth report, sucralfate was given orally and was believed to be the sole cause of esophageal obstruction.² Sucralfate has also been shown to cause gastric bezoar.⁷ Enteric-coated aspirin has been reported to cause gastric bezoar in a patient with rheumatoid arthritis who was taking 12 to 18 tablets a day.⁸ In this patient, the aspirin level was subtherapeutic because the aspirin was bound into the bezoar instead of being absorbed. Intestinal obstruction has been reported from aluminum hydroxide gel bezoar.⁹

Schneider¹⁰ reported three cases of esophageal impaction caused by Perdiem. Two of these patients (one had achalasia) had previous dysphagia, and one other patient had no dysphagia. All patients had symptoms of esophageal impaction develop soon after taking Perdiem, and all were treated by passing a 46F Maloney dilator under fluoroscopic control. Shortly after bouginage, one of the patients had symptoms of gastric outlet obstruction develop. A subsequent esophagogastroduodenoscopy revealed a 5-cm orange-gray ovoid bezoar with black specks in the stomach, similar to that described in our patients. This bezoar was broken up with a snare, resulting in prompt resolution of the patient's symptoms. In our first patient, the Perdiem bezoar caused complete obstruction of the esophagus at the level of a Schatzki's ring. We did not pass a Maloney dilator to relieve esophageal obstruction without performing an endoscopy because this is not considered the standard management of esophageal impaction by most endoscopists.¹¹

It appears that Perdiem bezoars occur in patients with dysphagia who have either structural or motility abnormalities of the esophagus. The second patient had a duodenal bezoar with dyspepsia but no specific obstructive symptoms. It is likely that the bezoar in this patient formed in the stomach and moved into the duodenum spontaneously. The Perdiem bezoar may have formed because of delayed gastric emptying associated with the inflammatory antral mass.

Many patients come to rely on psyllium products for their laxative and stool bulking effects, yet these preparations are frequently unpalatable. Perdiem, a bulk laxative, is a psyllium (82%) and senna (18%) compound formulated as granules with a slick coating. Perdiem is popular because of its slick surface and granular form. Directions for adult use recommend placing 1 to 2 rounded teaspoonfuls in the

mouth and swallowing with at least 8 fluid ounces of a cool beverage. These granules adhere to each other when wet, forming a globular mass that can obstruct a narrowed distal esophagus. The product package insert includes a warning of possible esophageal obstruction if taken by persons with known esophageal narrowing or if an insufficient amount of fluid is taken. It is important that physicians recognize the potential for esophageal, gastric, or duodenal bezoar formation, especially in patients with known esophageal abnormalities or conditions affecting motility in the UGI tract.

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The opinions and assertions herein are the private views of the authors and are not to be construed as reflecting the views of the Department of the Army or the Department of Defense.

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To the Editor:

In common with other groups we have seen a higher incidence of complications with precut papillotomy compared with standard sphincterotomy.¹ More than 6000 diagnostic and therapeutic ERCPs have been performed at this center since 1978, with a cannulation rate of 90%. When cannulation is unsuccessful we prefer to repeat the procedure at a

Figure 1. Cholesterol stone impacted at the ampulla and exposed through a choledochoduodenal fistula is pierced with the tip of a needle-knife sphincterotome.

Figure 2. Gentle manipulation allows extraction of the harpooned stone.

later date or to combine it with a percutaneous transhepatic approach.² Needle-knife papillotomy has been reserved for patients who have a bulging papilla caused by an impacted common bile duct stone. Occasionally, spontaneous expulsion of the stone does not occur even after extension of the papillotomy.^{3,4} Using the following case, we describe a simple technique to facilitate stone removal in this situation.

A 43-year-old man with a 2-week history of jaundice and colicky right hypochondrial pain was referred for ERCP. Marked elevations of his serum bilirubin and alkaline phosphatase levels were observed. Ultrasound showed multiple stones in his gallbladder and a dilated common bile duct (1.3 cm). At endoscopy the ampulla was well visualized and found to be bulging. Cannulation was not possible despite the use of tapered catheters and sphincterotomes. Using a needle-knife sphincterotome (Zimmon PTW1, Wilson-Cook Medi-

cal Inc., Winston Salem, N.C.), we created a choledochoduodenal fistula above the papillary orifice using the method described by Osnes and Kahrs.⁵ A large cholesterol stone impacted at the ampulla was then exposed. Despite extension of the fistula the stone remained lodged in the ampulla, preventing the safe passage of instruments for retrieval. The center of the exposed stone was pierced with the tip of the needle-knife sphincterotome using cautery (coagulation 50 W), causing the stone to adhere (Fig. 1). Extraction was easily achieved by gentle manipulation of the stone through the fistula (Fig. 2). Subsequent cholangiography showed a dilated biliary tree without stones and a gallbladder with multiple stones. Recovery was uneventful, and the patient was discharged from the hospital the next day. A laparoscopic cholecystectomy was performed 1 week later.

The urgency of dealing with impacted ampullary stones is underlined in the first case reported by Opie⁶ at the autopsy of a young woman. Impacted ampullary stones that prevent papillary cannulation and standard sphincterotomy make up less than 5% of common bile duct stones seen at ERCP.³ Several series suggest the safe use of needle-knife sphincterotomy to create a choledochoduodenal fistula or to allow subsequent standard sphincterotomy in this situation. These series have also reported failure to extract the stone so that surgical removal was required.^{3,4} Successful sphincterotomy may facilitate the early diagnosis of tumors that cause the ampulla to bulge. However, the endoscopist who creates a choledochoduodenal fistula must be aware that the patient may require subsequent open surgery. This technique to harpoon the exposed but impacted stone with the needle tip of the sphincterotome may prevent that eventuality.

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