Perforation of a duodenal diverticulum is rare. In this paper we report of a case of iatrogenic perforation, resulting from percutaneous radiologic extraction of a retained common-bile-duct stone.

**CASE REPORT**

A 71-year-old man was admitted with jaundice, vomiting and epigastric pain with tenderness of 48 hours’ duration. Cholecystitis was found. At operation a fibrous inflammatory cover was seen over the gallbladder and the common bile duct. The cholecystectomy specimen contained a single calculus, 1 cm in dimension; no calculi were found on exploration of the common bile duct. T-tube cholangiography 6 weeks later revealed a retained stone in the common bile duct and a perivaterian duodenal diverticulum (PDD) (Fig. 1), 4 cm long. The T tube became dislodged the next day, and manipulation through the tract under fluoroscopic control resulted in migration of the stone into the duodenum and perforation of the PDD, demonstrated by instillation of contrast media (Fig. 2). A rubber catheter was immediately inserted into the common bile duct through the T-tube tract.

Diaphoresis soon developed, and the patient had severe epigastric pain and tenderness. At operation, done within 6 hours of the perforation, bile-stained fluid was noted in the retroperitoneal area anterior to the pancreas, where a perforated PDD was found. Its 1.5-cm opening into the duodenum felt indurated. A no. 26 Malecot catheter was secured inside the PDD with a purse-string suture, and a Penrose drain was placed nearby.

The patient’s postoperative course was complicated by left iliofemoral thrombophlebitis, pulmonary embolism and bleeding from a gastric ulcer. A Greenfield filter was required, and parenteral nutrition was begun. The Malecot catheter became dislodged on the 20th postoperative day. All duodenal drainage ceased 1 week later, at which time oral feedings were resumed. He remained asymptomatic.

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**IATROGENIC PERFORATION OF PERIVATERIAN DUODENAL DIVERTICULUM: REPORT OF A CASE**

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The author reports a case of iatrogenic perforation of a duodenal diverticulum, an extremely rare occurrence, during percutaneous radiologic extraction of a retained common-bile-duct stone. Perforation was related to the perivaterian location of the duodenal diverticulum. Because an inflammatory reaction was present, tube duodenostomy was chosen over excision, closure and drainage to prevent the complication of lateral duodenal fistula and sepsis. Whenever iatrogenic duodenal perforation is suspected, prompt radiologic documentation and early surgical consultation should be sought.

L’auteur décrit un cas de perforation iatrogène d’un diverticule duodénal, cas extrêmement rare, au cours de l’extraction radiologique percutanée d’un calcul emprisonné du cholédoque. La perforation était liée au fait que le diverticule duodénal entourait l’ampoule de Vater. Comme il y avait inflammation, on a préféré la duodénostomie tubulaire à l’excision, à la fermeture et au drainage pour prévenir la complication causée par la fistule duodénale latérale et l’infection. Chaque fois qu’on soupçonne une perforation duodénale iatrogène, il faut demander sans tarder un examen radiologique et une consultation chirurgicale rapide.
for 5 years although recent upper gastrointestinal radiographs showed that the PDD was unchanged.

**DISCUSSION**

Duodenal diverticula are found in up to 5% of the population on radiography and in a much higher percentage (12.5% to 23%) on endoscopic retrograde cholangiopancreatography (ERCP) for suspected biliary or pancreatic disease. The diverticula in 71% of cases originate within 2 cm of the ampulla of Vater. An ampulla opening into a diverticulum is not uncommon (6.8% to 18.9% in selected case studies based on ERCP findings). Although 101 cases of spontaneous perforation have been reported, our case appears to represent the first perforation of a PDD during extraction of a retained common-bile-duct stone through the T-tube tract. Other reported cases of iatrogenic perforation of a PDD include at least one injury during biliary surgery and one after endoscopic debridement of concretions within a PDD. In view of the high incidence of reports of PDD, based on ERCP findings, iatrogenic injury of diverticula should be anticipated during endoscopic sphincterotomy, although apparently they have not been reported.

Duodenal perforation, which may involve a PDD, occurs in 1% to 4% of patients undergoing endoscopic sphincterotomy. Radiologic evidence of extraluminal contrast medium or air is diagnostic. Computed tomography can aid in the differentiation between perforation and pancreatitis. Any suspicion of perforation mandates timely surgical consultation.

Most surgeons favor early surgical intervention for this complication. However, there is a subset of patients in whom the clinical findings are minimal. If rapid improvement occurs with supportive treatment, recovery without surgery is possible. Strict guidelines must be followed, and continuing monitoring by the surgeon and the gastroenterologist is required. There is controversy concerning treatment because operative delay beyond 8 hours increases morbidity and mortality. There is agreement that patients with a “major perforation” should undergo early operation.

The only report of iatrogenic endoscopic perforation of a PDD resulted in necrotizing pancreatitis and duodenal fistula. There are very few reports of survival without operation after spontaneous perforation of a PDD. The preferred operation has been excision, closure with a serosal patch and drainage. Frequent sequelae have included suture-line leakage and sepsis, pancreatitis and biliary obstruction. Tube duodenostomy, used in our case, appears to be a safer approach to this problem, with reports of good results.

Surgical management of duodenal perforation, with or without periarterian duodenal diverticular involvement, includes the parenteral high-dose administration of antibiotics and nasogastric suction and an aggressive attempt to document the perforation by...
radiologic means, including computed tomography. A trial of nonoperative treatment may be considered if symptoms are mild and improvement is rapid. Patients with fever and leukocytosis in combination with an acute abdomen should be considered for expeditious surgery. Surgical treatment of endoscopic sphincterotomy-related perforation of the duodenum (without peripancreatic duodenal diverticular involvement) depends on clinical findings and has included various drainage procedures (for smaller injuries), simple closure and a controlled fistula. Tube duodenostomy is recommended as an effective method of treatment for iatrogenic perforated PDD. It produces a controlled duodenal fistula and avoids most of the complications related to excision and closure.

References


