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Case Report

Gallstone ileus of duodenum with huge duodenal stone

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Abstract

Gastrointestinal obstruction by a gallstone is an uncommon but important complication of biliary stone disease which mostly affects the elderly. The classic triad of radiological features includes pneumobilia, ectopic gallstone and evidence of intestinal obstruction. Terminal ileum is the most common site of obstruction, followed by jejunum and gastric outlet. We present a case of duodenal gallstone ileus of a large, fluid-density mixed biliary stone with a peripheral rim of hyperdensity (very fine calcification) in CT scan.

KEY WORDS: Gallstone ileus, duodenum, intestinal obstruction.

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Gallstone ileus is a mechanical gastrointestinal (GI) obstruction caused by cholecystoduodenal fistula and impaction of gallstone in any part of the GI tract [1]. Although only 3% of biliary stones lead to gallstone ileus (especially in elderly obese females) 6, it accounts for up to 25% of all cases of small bowel obstruction in patients over 65 years of age [1]. Gallstone enters the GI tract through a fistula between the gallbladder or bile ducts and the GI tract (more commonly the postbulbar area of duodenum). Generally, the sequence of events is cystic duct obstruction, cholecystitis, pericholecystitis, gallbladder gangrene, fistulization to a hollow viscus passage of stone, and eventually intestinal obstruction [2,3]. This obstruction usually occurs when the stone is greater than 2.5 cm in diameter. Terminal ileum and gastric outlet (Bouveret Syndrome) are the usual sites of obstruction [2]. Conventional radiography, ultrasound and especially CT scan are used for diagnostic evaluation [4]. Since the structural composition of biliary stone is the mainstay of their appearance in X-Ray imaging modalities, an overview of their composition is mandatory (see discussion). Although sonography is the first-line imaging modality for biliary stone disease, the diagnosis of gallstone ileus is confirmed by CT and the appearance of stone varies according to the molecular structure of stone particles [5].

Case presentation

A 59-year-old male with chronic epigastric pain and recent intractable vomiting was admitted for evaluation of upper GI and biliary tract. There was no history of fever, icterus, weight loss and GI bleeding. He was a known case of surgically treated adenomatous hyperparathyroidism (parathyroidectomy 14 years ago) with history of pelvic bone graft due to pathologic fracture. He also had a positive history of non-insulin dependent diabetes mellitus and a strong family history of cholelithiasis (cholecystectomy in four siblings). There was no history of addiction. Biochemical laboratory data were unremarkable and upper GI endoscopy demonstrated bile reflux with moderate gastroduodenitis. Ultrasound depicted pneumobilia with echogenic and contracted gallbladder compatible with chronic cholecystitis and could not identify the probable obstructive cause of his symptoms. For further assessment of the obstructive nature of his severe nausea

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and vomiting, abdominal CT and then conventional upper GI examination were performed. Spiral thin collimation axial CT scan of abdomen with coronal reconstruction confirmed pneumobilia and abnormal gas in gallbladder fossa. A large 8×5 cm hypodense oval intraluminal mass (10-15 HU) was detected in the third duodenum with a fine rim of increased density surrounding it (figure 1).

The diagnosis of a huge fluid-density biliary duodenal stone with slight marginal calcified particles was more likely versus a duodenal bezoar. Upper GI series also revealed an intraluminal duodenal filling defect with subtotal obstruction and fine leakage of barium from the first duodenum into the gallbladder (figure 2). The surgical laparotomy confirmed intraluminal mass (stone) in the third duodenum with nearly normal duodenal mucosa and fistulization of GB to the first part of duodenum. Cholecystectomy, stone removal, fistula closure and bowel wall repair were performed. Histopathologic examination confirmed chronic cholecystitis with a large biliary stone of mixed type (figure 3).

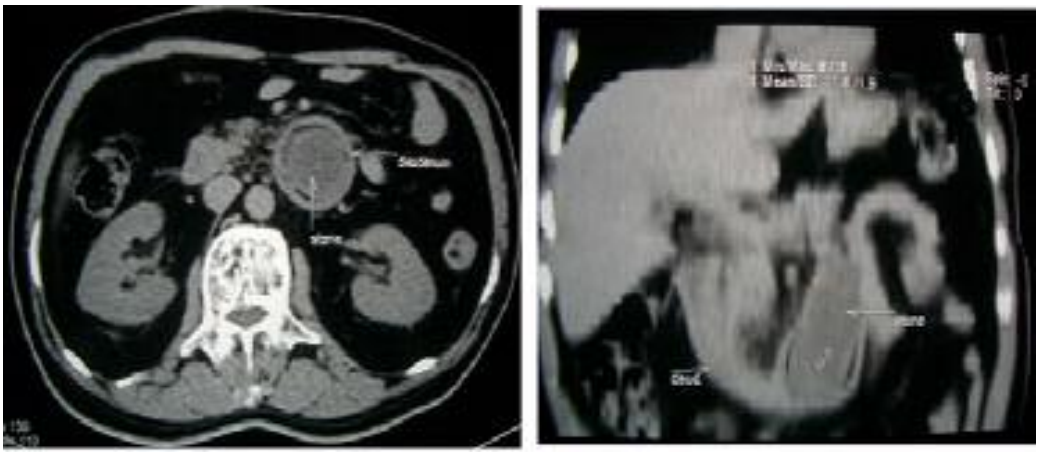

Figure 1. Abdominal CT scan showing a large fluid-density duodenal stone with fine marginal hyperdensity

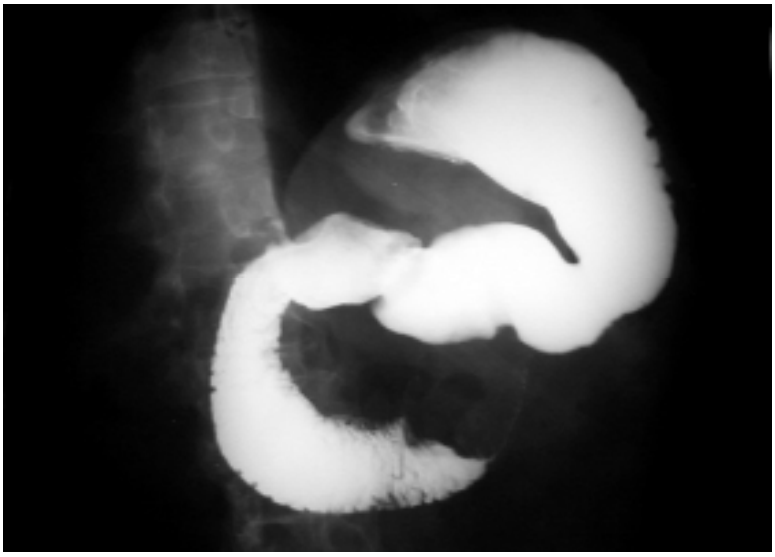

Figure 2. An upper GI examination shows an intraluminal duodenal filling defect with mild bulbar contrast leakage to the biliary system.

Figure 3. Large biliary stone of the mixed type

Discussion

Although rare, gallstone ileus should be considered in intestinal obstructions especially in old age [2]. Because the radiographic and sonographic triad of pneumobilia, intestinal obstruction, and ectopic gallstone is present in less than 60%, early use of CT plays a vital role in early and accurate diagnosis [6]. As CT is increasingly used in assessment of intestinal obstruction, its ability to detect non-calcified biliary stones is a valuable priority in early diagnostic evaluation [6]. As compared with CT, ultrasound can not provide definitive diagnosis of gallstone ileus because of deep intraluminal location of non-calcified or minimally calcified stones [6]. Biliary stones are easily visible on unenhanced scans only if their CT attenuation significantly differs from that of surrounding bile [6]. Up to 90% of biliary stones have mixed composition containing cholesterol and calcium. The remaining 10% are pigmented stones, pure cholesterol and pure calcium stones [6]. Thus, mixed stones range from hypoattenuating to hyperattenuating according to the amount of calcium content. Pigmented stones are hyperdense [3]. The CT appearance is classified as follows: laminated (43%) hyperdense (32%), rimmed, isodense, and faint [3]. As in this case, less calcification in rim-calcified mixed stones may lead to false negative results because of poor differentiation from the intestinal wall.

Gallstone ileus of duodenum is a rare entity and there are a few reported cases of duodenal gallstone ileus in the literature with different size and densities, but the noteworthy features of our case are the very low CT attenuation (mean value: 10-15 HU) of the central part of the stone and its very large size (8×5 cm). This case also had a strong family history of biliary stone disease and long-term history of primary hyperparathyroidism.

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