

Giant Common Bile Duct Stone

Case Report

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Abstract: Bile duct stones, which obstruct the common bile duct, potentially result in complications, such as acute cholangitis and pancreatitis. We present a case involving a patient with normal liver function tests from whom we removed a giant common bile duct stone measuring 7.5 centimeters x 4.0 centimeters x 4.0 centimeters. Postoperatively recurrent common bile duct stones were observed and removed with an endoscopic maneuver in the three-year follow-up period. Recurrent bile duct stones are frequently reported in the case of large size of stones or multiple stones. Surgical treatment may then be considered as a first-line treatment in cases of recurrent common bile duct stones. When an endoscopic or surgical approach is used for the treatment of giant common bile duct stones, careful observation is of the utmost importance and treatment innovations may be necessary.

Keywords: *Cholelithiasis • Gallstones • Surgery*

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1. Introduction

Bile duct stones, which obstruct the common bile duct, potentially result in complications, such as acute cholangitis and pancreatitis. Some patients may remain asymptomatic, while others progress to a symptomatic stage [1]. Usually, laboratory results reveal cholestatic liver function tests, such as elevated serum gamma glutamyl transpeptidase and alkaline phosphatase [2]. sphincterotomy and needle knife papillotomy are very effective for the removal of an impacted stone in the ampulla of Vater. However, depending on the size, site, and situation of the impacted stone, we have often encountered difficulties during endoscopic treatments. Moreover, recurrence has been reported frequently in the case of a large stone or multiple stones [3]. The type of surgical treatment depends on the clinical situations and the size of the dilated common bile duct. We present a case involving a patient with normal liver function tests and a dilated common bile duct, from whom we

removed a giant common bile duct stone measuring 7.5 centimeters x 4.0 centimeters x 4.0 centimeters.

2. Case Report

A 72-year-old woman was admitted with a 30-day history of epigastric discomfort, postprandial abdominal pain, and vomiting. She had complained of mild and self-relieving dyspepsia for 3 years. Her medical history was significant for hypertension and diabetes mellitus. The examinations revealed a chronically ill-appearing woman with tenderness in the right upper quadrant. complete blood count was normal. The biochemical parameters were as follows: serum sodium, 127.2 mmol/L; serum potassium, 3.0 mmol/L; serum chloride, 88.2 mmol/L; serum osmolality, 260 mOsmol/kg; serum amylase, 463 U/L. The serum electrolytes and urine analysis were normal. The liver function tests were as follows: serum bilirubin, 0.9 mg/dl; total protein, 6.8 g/

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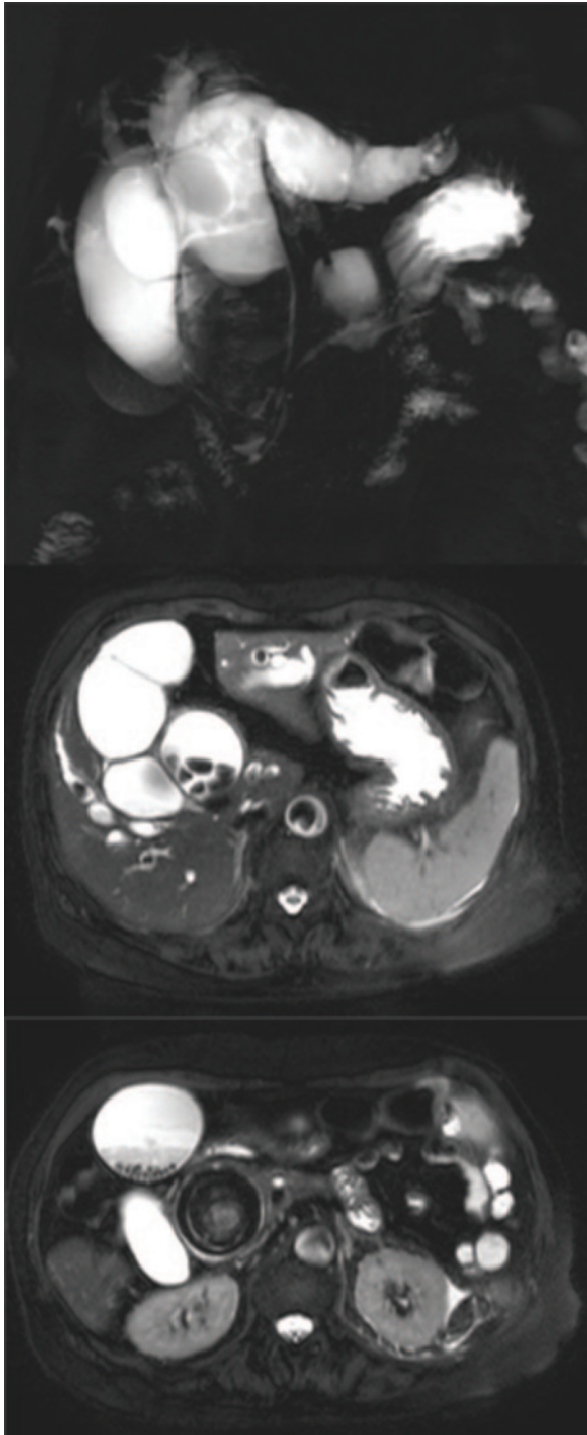


Figure 1. Abdominal magnetic resonance imaging (T2 weighted image) showed gallstones, intrahepatic stones in segments 2, 5, and 6, and large impacting common bile duct stones in the common bile duct with fusiform dilatation, markedly dilated intrahepatic and extrahepatic bile ducts, and a distended gallbladder.

dL; albumin, 4.2 g/dL; and serum alkaline phosphatase, 79 IU/L. A esophagogastroduodenoscopy revealed a healed mucosal break at the esophagogastric junction,

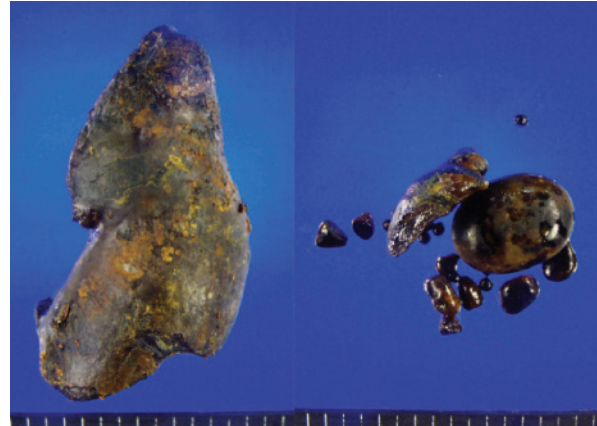


Figure 2. The largest common bile duct stones measured 7.5 centimeters x 4.0 centimeters x 4.0 centimeters, and 3.8 centimeters x 2.5 centimeters x 1.2 centimeters.

healed shallow ulcers and several erosions in the antrum, scattered focal hyperemia in the cardia and fundus, and venous dilatation in the fundus. An abdominal computed tomography and magnetic resonance imaging (Figure 1) showed gallstones, intrahepatic stones in segments 2, 5, and 6, large impacting common bile duct stones in the common bile duct fusiform dilatation, markedly dilated intrahepatic and extrahepatic bile ducts, and a distended gallbladder. Endoscopic retrograde cholangiopancreatography showed a markedly dilated common bile duct with multiple huge stones, dilated intrahepatic ducts and stones, and gallstones. The pancreatic duct was normal. Although an endoscopic sphincterotomy was performed, the endoscopic removal of the giant common bile duct stones was not successful. On laparotomy, multiple adhesions were found around the gallbladder and liver, which were carefully lysed. The common bile duct was dilated and thickened. A palpable hard mass was felt in the middle portion extending down to the duodenum. Stay sutures were placed and the common bile duct was opened. A large stone and numerous small stones were noted in the duct. The liver parenchyma was normal. Intrahepatic stones were removed using a choledochoscopic device. The dilated common bile duct was partially resected and the size of the bile duct was reduced. A T-tube was placed and the common bile duct was closed around the T-tube. The gallbladder was removed and shown to contain numerous small stones. The post-operative course was completed without any difficulties and issues. The largest common bile duct stones measured 7.5 centimeters x 4.0 centimeters x 4.0 centimeters, and 3.8 centimeters x 2.5 centimeters x 1.2 centimeters (Figure 2). The common bile duct had mild dysplasia and chronic inflammation on the pathologic report. After eight weeks, T-tube cholangiography revealed the remnant common bile duct stones and intrahepatic

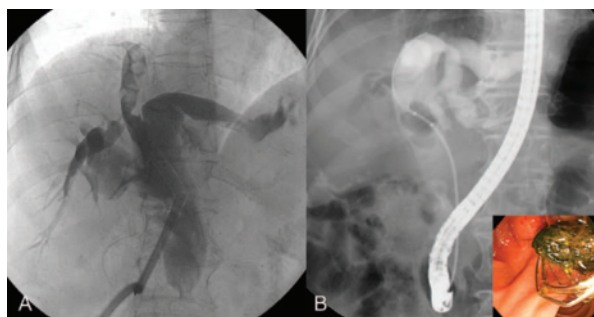


Figure 3. (A) Multiple filling defects and diffuse dilatation of common bile duct and intrahepatic duct were shown in the T-tube cholangiography. (B) Diffuse dilatation with single ovoid filling defect was seen in the intrahepatic and common bile duct. The bile duct stone was treated by an endoscopic basket with mechanical lithotripsy.

stones in the diffuse dilatation of common bile duct and intrahepatic duct (Figure 3A). Remnant common bile duct and intrahepatic duct stones were treated by endoscopic maneuvers. Unfortunately, a single recurrent common bile duct stone was found after one year and was treated by endoscopic maneuver as well (Figure 3B). Her course after the previous endoscopic intervention, by outpatient follow-up, has been uneventful.

3. Discussion

Approximately twenty cases involving giant common bile duct stones have been reported. More than 80% of all common bile duct stones can be effectively treated by endoscopic sphincterotomy and stone extraction using baskets or balloon catheters. For stones up to 2.5 centimeters in diameter, mechanical lithotripsy is the method of choice for the next step [4]. Matsumoto *et al.* [5] reported a successful removal of large common bile duct stones using an endoscopic maneuver; however, the larger size [6] and impact [7] of common bile duct stones were an important factor for failure of endoscopic management.

We present a patient who had a giant common bile duct stone, as well as intrahepatic bile duct stones and gallstones, and who did not exhibit cholestatic liver function tests. We performed a cholecystectomy, common bile duct exploration, modification of the common bile duct to a smaller diameter, and T-tube insertion. However, we did not perform a choledochenterostomy and liver resection because of the patient's advanced age, the absence of atrophy of the liver parenchyma, and the dilatation of both intrahepatic ducts. In the case of recurrence, treatment options would include stone removal using both an endoscopic and percutaneous approach. The normal liver function tests in our patient suggested that the size of the common bile duct had

become enlarged insidiously because of the size of the stones over time without definite symptoms. Similar to our report, Holtmann *et al.* [8] reported a case with impacted stents that favored the development of giant bile duct stones and resulted in clinical symptoms only after prolonged periods of time. Hussain *et al.* [9] reported a patient with normal liver function tests involving a giant common bile stone, 8 centimeters x 2 centimeters in size. No complications, such as rupture or perforations resulting from giant common bile duct stones, have been reported. The presence of such a large stone without an associated jaundice is rare [9].

There are several reported cases involving giant common bile duct stones [8,10]; however, multiple giant common bile duct stones, concomitant intrahepatic large bile duct stones, and a dilated intrahepatic bile duct were uncommon in those cases. Size of a giant common bile duct stone is usually defined as >3 [8,10]. Some reports which have demonstrated that giant common bile duct stones can be removed using an endoscopic device regardless of the size, revealed that the size of the common bile duct stone was >2 cm in diameter [11-13].

The importance of surgery for giant common bile duct stones has gradually diminished because of the early detection of common bile duct stones based on the development of endoscopic devices, concerns about health, and an increased chance of health screening. The dilated common bile duct may evoke the recurrence of common bile duct stones. Recurrent bile duct stones were reported frequently in the case of large size of stones, multiple stones, and the presence of pneumobilia [3,14]. The dysmotility of the bile duct tract was usually confined to the gallbladder dyskinesia and sphincter of oddi dysfunction [15]. However, delayed biliary motility in cholecystectomized patients is one of the clinical factors involved in the pathogenesis of recurrent CBD stones after sphincterotomy [16].

Choledochal cyst was considered as a cause of giant common bile duct and intrahepatic bile duct stones, which was almost accompanied by abnormalities of the pancreaticobiliary junction typically consisting of a long common pancreatobiliary channel, an abnormal angle of insertion of the common bile duct, and a variable degree of proximal bile duct stenosis [17]. In our case, abnormalities of the pancreaticobiliary junction were not found in the endoscopic retrograde and magnetic resonance cholangiopancreatography. Choledochal cyst with long-term complications of large stone cast and portal hypertension due to secondary biliary cirrhosis was reported [18], but other long-term complications, such as secondary biliary cirrhosis and portal hypertension were not found in our case.

Above all, the treatment strategy for giant common bile duct stones is identical to that of surgical treatment for bile duct stones; specifically, remove all existing bile duct stones and prevent recurrent stone formations.

Then surgical treatment, such as Roux-en Y choledochoenterostomy, may be considered as a first line treatment in cases of large size of common bile duct stones, multiple stones, or recurrent bile duct stones.

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