



Porcelain Gallbladder or a Special Type Stone? A Case Report about Novel Gallbladder Disease

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Abstract

Porcelain gallbladder is a mild and rare disease. Patients are usually asymptomatic and the diagnosis is often made incidentally on a plain abdominal CT scan. The CT scan was performed because the patient was abdominal pain after meal and the result was gallbladder neck stones and partial gallbladder wall calcification. Two days before the operation, the patient's another abdominal CT scan showed that gallbladder wall is not calcified. The calcified gallbladder wall disappeared. Due to frequent episodes of abdominal pain, the patient underwent laparoscopic cholecystectomy. Postoperative specimens were found in the gallbladder neck stones and gallbladder mucosa attached to white jelly-like substances. The result of the abdominal CT scan was overturned: The porcelain white jelly-like substance attached to the gallbladder mucosa was not calcified by the gallbladder wall and may be the early manifestation of solid stones (semi-solid stones).

Keywords: Porcelain gallbladder; Gallbladder stone; Calcified gallbladder wall; Cholecystitis

Introduction

Porcelain gallbladder refers to the gallbladder wall is formed into a hard, fragile and pale blue shape due to calcification. Cornell first reported and proposed the concept of "ceramic gallbladder" in 1959 [1]. The overall incidence of the disease is very low, about 0.06% to 0.80% [2,3]. A report on the suspected gallbladder wall porcelain in our hospital is as follows.

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Case Presentation

A 60-year-old patient was hospitalized due to abdominal pain lasted more than two months in the right upper quadrant after high fat diet. The patient had no jaundice, nausea, vomiting or fever and was physically healthy. Investigations revealed that he had no medical history of malignancy. Physical examination was right upper quadrant tenderness, swollen gallbladder under the right ribs margin and no tenderness in the lower back. Abdominal CT scan (1 month before operation, Oct 16th, 2018) showed that the volume of gallbladder was reduced, the wall was thickened and calcified (Figure 1), and the circular calcareous density was observed in the neck region of the gallbladder and there was a gallbladder stone with diameter 1.46 cm (Figure 1). But the patient's another abdominal CT scan (two days before the operation, Nov 23rd, 2018) showed that gallbladder wall was not calcified (Figure 1) and there was a little bigger gallstone in the neck region of the gallbladder (diameter was 1.63 cm) (Figure 1). The clinical diagnosis was porcelain gallbladder with gallstones. Due to frequent episodes of abdominal pain, the laparoscopic cholecystectomy is performed. During the operation, the doctor found that the gallbladder wall of the patient was hard and severely adhered to the surrounding tissues. In view of this situation, the patient's gallbladder was completely removed after gradual separation of gallbladder wall and the surrounding adhesion tissue. By observing the resected gallbladder, the gallbladder wall is thickened, the texture is soft and attached with sticky milky jelly-like substance, like plaster (Figure 2). The jelly-like substance is located in the gallbladder cavity and has a clear boundary with the gallbladder wall. Beyond that, a spherical stone can be observed on the neck of the gallbladder. Pathological examination after the operation showed that the gallbladder mucosa was rough and attaches to white jelly-like substances, no canceration.

Discussion

Porcelain gallbladder is characterized by the gallbladder wall with a hard, fragile and pale blue special shape is a pathological change of cyst wall which caused by long-term inflammation

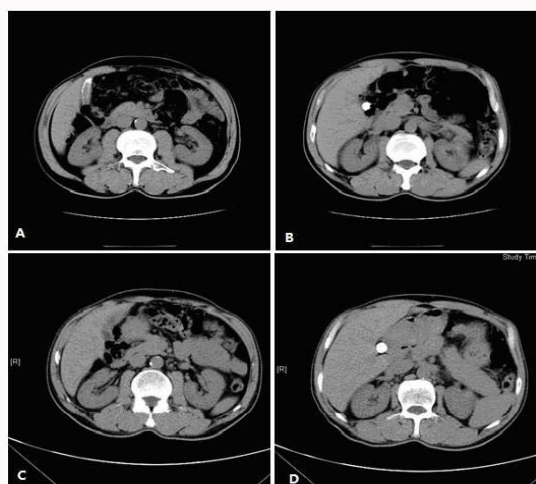


Figure 1: The CT scan of upper abdomen. A. the wall of gallbladder was thickened and calcified. B. the diameter of gallbladder stone was 1.46 cm. C. the calcified wall of gallbladder was disappeared. D. the diameter of gallbladder stone was 1.63 cm.

recurrence and calcium deposition. Porcelain gallbladders are associated with gallstones in 90% of cases. The patho-genesis of gallbladder calcification is still unclear and it is considered a result of obstruction of cystic duct leading to the precipitation of calcium salts in the mucosa or as a result of chronic inflammation resulting in the hemorrhage, scarring, and hyalinization of the wall causing deposition of calcium salts. The transformation of the gallbladder wall shown from the patient's twice abdominal CT scans negates the diagnosis of porcelain gallbladder, but this phenomenon distinguished from the porcelain gallbladder need further study. The main components of gallstones are cholesterol, bile pigment, a small proportion of calcium salts as well as mucin glycoproteins. Alterations in bile composition, impaired gallbladder relaxation, and accelerated nucleation are the principal mechanisms leading to gallstones formation. According to the main components of gallstones, it can be divided into two major categories: Cholesterol stones and bile pigment stones. From a worldwide perspective, 70% to 80% of gallstones are cholesterol stones [4]. Traditionally, the formation of gallstones is explained as: The cholesterol in the bile is excessively secreted or too little micelles caused by insufficient secretion of bile salts and lecithin is not enough to dissolve too much cholesterol, then supersaturated bile will form and cholesterol crystals precipitates to form cholesterol stones [5]. The porcelain white jelly-like substance attached to the gallbladder mucosa may be the pre-existing performance of solid stones (semi-solid stones). The cause of the formation of semi-solid stones may be related to the absorption and secretion of the gallbladder mucosa, absorption of the gallbladder mucosa can significantly increase the concentration of lipids, calcium and glycoproteins in the gallbladder. Gallbladder mucosa can also actively secrete mucus, which is made up of mucin and many glycoproteins, all of the above can promote the formation of gallstones. Cystic duct obstruction promotes calcium carbonate formation in bile and increases gallbladder mucin

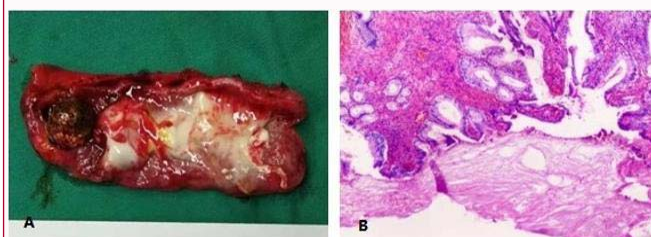


Figure 2: A. The gross specimen of gallbladder after operation. It was attached with sticky milky jelly-like substance. B. the gallbladder mucosa was rough and attaches to white jelly-like substances.

production [6]. Cholestasis and increased absorption of gallbladder may promote formation of gallstone, and gallbladder absorption increase the concentration of lithogenic factors in bile and facilitate nucleation and stone growth [7]. The patient's abdominal CT scan performed a month ago shows that the gallbladder wall density increases, and the abdominal CT scan gallbladder wall is not calcified during surgery. However, the gallstone in the neck of the gallbladder is larger than before (The diameter of the gallstone changes from 1.46 cm to 1.63 cm.), and the components attached to the gallbladder mucosa may be converted into stones. The cause and mechanism of formation of semi-solid stones are still unknown. How to differentiate the porcelain gallbladder and semi-solid stones in gallbladder before operation need further study.

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