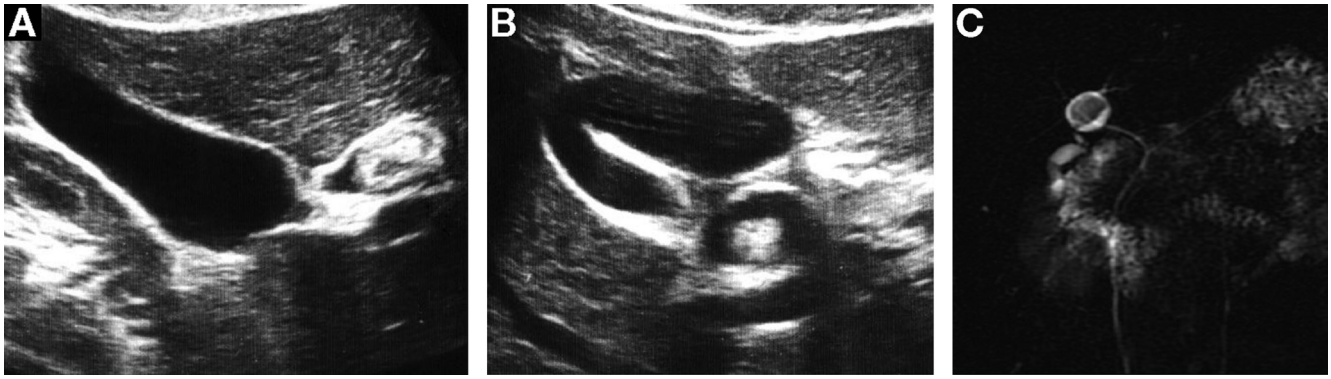
# Stone-containing Cystic Mass at the Portal Hilus of the Liver in an Asymptomatic Young Female Patient

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**Question:** A 40-year-old asymptomatic young female patient was admitted to our liver disease outpatient clinic for incidentally detected stone-containing cystic liver mass on computed tomography examination. She had no problems in her past medical history. Physical examination was normal. Laboratory investigations included hemoglobin of 13.7 g/dL; white cell count of 7.5 $\times$ $10^9$/L; a normal white blood cell differential count, and a platelet count of 219 $\times$ $10^9$/L. Her serum alanine aminotransferase was 13 IU/L, serum aspartate aminotransferase level 20 IU/L, gamma-glutamyl transpeptidase 11 IU/L, alkaline phosphatase 77 IU/L, and total bilirubin 0.5 mg/dL. The remaining laboratory tests were all within the normal range. Serologic studies for hepatitis B virus and C virus were all negative. For differential diagnosis, tumor markers included carcinoembryonic antigen, CA 19-9, CA 15-3, CA 125, and alpha-fetoprotein; all levels were normal.

Abdominal ultrasonography (US) documented a well-circumscribed cystic mass, measuring 22 mm in diameter, adjacent to the gallbladder. A clearly defined 12 mm calculus was shown within the cyst (Figure *A*, *B*). Magnetic resonance cholangiopancreatography (MRCP) revealed a normal appearing gallbladder by the side of the cyst and nondilated intrahepatic and extrahepatic bile ducts. Cystic structure was superimposed on the hepatic confluence as a well-circumscribed unilocular rounded hyperintensity (Figure *C*).

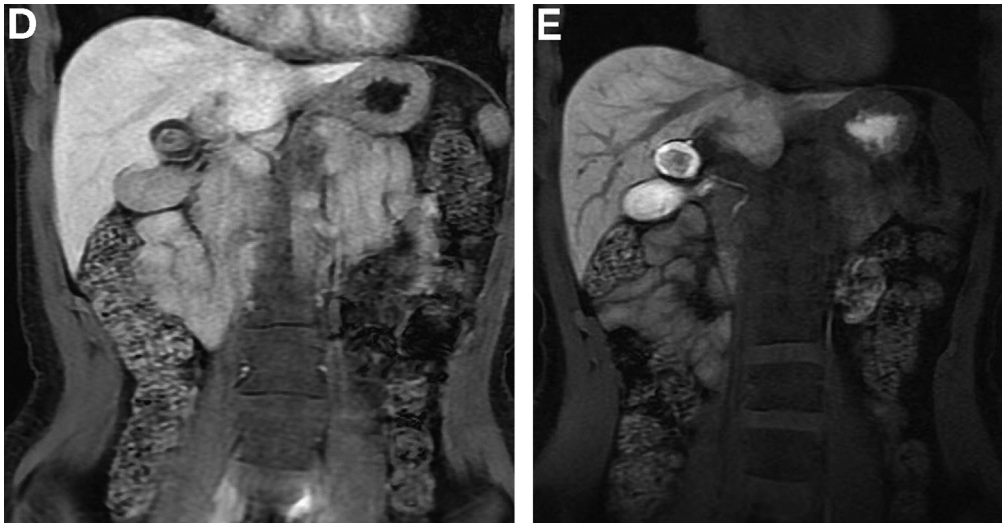
With the imaging results presented, what is the most likely diagnosis? What is the next step in management for this patient?

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**Conflicts of interest**
The authors disclose no conflicts.

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## Answer to: Image 3: Duplication of the Gallbladder




Possible contiguity of the cyst with the biliary system could not be demonstrated accurately during the US examination. Because the gallbladder seemed to be normal, the cystic structure was thought to be a duplicated gallbladder containing a stone and further examination with MRCP was recommended to better characterize anatomy. Contrast-enhanced MRCP with hepatobiliary contrast agent (Gd-EOB-DTPA) was performed for the documentation of the possible cystobiliary communication. Hepatobiliary phase images were acquired 10, 20, and 60 minutes after intravenous administration of the contrast agent. Enhancement of bile within the bile ducts and gallbladder began as early as 10 minutes after the contrast agent injection. The presumptive diagnosis of double gallbladder was confirmed by demonstrating the cyst completely filled with contrast material on the images obtained at 20 minutes, a finding indicative of communication between the cystic structure and the biliary system. A large filling defect representing a gallstone was also observed within the cyst (Figure *D*, *E*).

Duplication of the gallbladder may occur owing to abnormal branching of the foregut buds. This is very rarely seen, occurring in about 1:4000 cases.[1] There are 2 types of gallbladder duplication determined: *vesica fellea divisa*, in which both gallbladders have a common neck or cystic duct, and vesica fellea duplex, in which the gallbladders have 2 cystic ducts that can join the main bile duct separately or after they come together.[1] Patients with duplicated gallbladder can be asymptomatic or symptomatic, which are varied from abdominal discomfort, right upper quadrant abdominal pain as a biliary colic, and nausea with or without vomiting.

Abdominal US is a highly sensitive diagnostic method to examine the pathologies of the gallbladder. However, in some cases, MRCP is a more accurate in evaluating the anatomy of the biliary system.[2] Choledochal cyst, gallbladder diverticulum, focal adenomatosis, and duodenal cyst should be ruled out in the differential diagnosis.[2] In the literature, there is no evidence of the increased incidence of diseases or cancer associated with duplicated gallbladder compared with a single gallbladder.[3]

No surgical intervention is recommended in asymptomatic case. If surgical intervention is performed, both gallbladders should be removed. The biliary system anatomy should be clearly documented before the surgical intervention to avoid biliary injuries.[3] At present, the patient was asymptomatic and follow-up was advised.

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