

BILIARY CYSTADENOCARCINOMA ASSOCIATED WITH ATROPHY OF THE LEFT HEPATIC LOBE AND HEPATOLITHIASIS MIMICKING INTRAHEPATIC CHOLANGIOCARCINOMA: A CASE REPORT

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Biliary cystadenocarcinoma and its benign counterpart, biliary cystadenoma, are rare hepatic cystic tumors arising from the hepatobiliary epithelium. We report the case of a 68-year-old Taiwanese woman who presented initially with acute cholangitis. A series of imaging studies including abdominal ultrasound, computerized tomography, endoscopic retrograde cholangiopancreatography, and percutaneous transhepatic cholangiography showed bilateral intrahepatic duct (IHD) and common bile duct (CBD) stones with IHD and CBD dilatation, and an ill-defined tumor within the atrophied left hepatic lobe. The patient underwent surgical resection of the tumor and choledocholithotomy. The pathologic diagnosis was biliary cystadenocarcinoma. We review this rare disease entity and discuss its unusual radiologic features mimicking intrahepatic cholangiocarcinoma.

Key Words: cystadenoma, cystadenocarcinoma, cholangiocarcinoma
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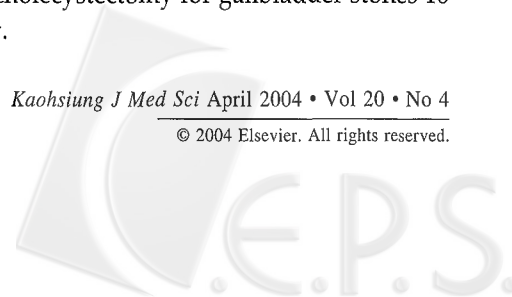
Biliary cystadenoma and cystadenocarcinoma are rare cystic tumors. They are most commonly intrahepatic. From ultrasound and computerized tomography (CT), biliary cystadenoma and cystadenocarcinoma are described as multilocular cystic lesions with associated internal septations and nodularities [1]. It is not usually difficult to distinguish biliary cystadenoma or cystadenocarcinoma from predominantly solid lesions of the liver such as cholangiocarcinoma and hepatoma. However, they should be differen-

tiated from other hepatic cystic lesions. We present a case of biliary cystadenocarcinoma associated with atrophy of the left hepatic lobe and hepatolithiasis mimicking intrahepatic cholangiocarcinoma on imaging studies.

CASE PRESENTATION

A 68-year-old Taiwanese woman was well until 1 month prior to admission, when she developed intermittent abdominal discomfort located mainly in the right upper quadrant. Five days prior to admission, she began to have intermittent fever and chills. She had undergone low anterior resection for rectal adenocarcinoma (Duke's B) 11 years previously and cholecystectomy for gallbladder stones 16 years previously.

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On admission, physical examination revealed a body temperature of 38.3°C, mild icterus, and enlargement of the right hepatic lobe. Laboratory findings were as follows: white blood cell count 18,300/mm³ (normal, 4,000–11,000/mm³), aspartate aminotransferase/alanine aminotransferase 99/53 IU/L (normal, < 25 IU/L), total bilirubin 2.6 mg/dL (normal, 0.2–1.0 mg/dL), alkaline phosphatase 552 IU/L (normal, 50–180 IU/L), γ -glutamyl transpeptidase 540 IU/L (normal, < 32 IU/L), α -fetoprotein 4.4 ng/mL (normal, < 20 ng/mL), carcinoembryonic antigen 6.74 ng/mL (normal, 0–6 ng/mL), and carbohydrate antigen 19-9 676 U/mL (normal, 0–37 U/mL). Serologic tests for hepatitis B and hepatitis C infection were negative. Urine and stool examinations were normal.

History, physical examination and laboratory studies suggested the possibility of biliary tract infection. Abdominal ultrasound revealed a small left hepatic lobe with dilated intrahepatic ducts (IHD). A mixed echoic mass lesion with some acoustic shadowing was located within the left hepatic lobe. The right hepatic lobe was enlarged with dilated IHD and intrahepatic stones (not shown). The common bile duct (CBD) was also dilated (Figure 1). Abdominal CT disclosed

a hypoattenuated mass lesion in the atrophied left hepatic lobe, with internal septa and punctate calcified spots in the septa or along the wall. The right IHD and CBD were dilated (Figure 2). Endoscopic retrograde cholangiopancreatography (ERCP) revealed large filling defects in the dilated CBD (Figure 3A). Endoscopic sphincterotomy did not include stone removal because of the large stone size (> 1.5 cm) and lack of facilities (such as mechanical lithotripsy). The papilla of Vater was bulging, but there was no mucus excretion. Three days later, percutaneous transhepatic cholangiography (PTC) was indicated to evaluate the biliary tree above the obstruction. It showed amorphous filling defects in the common hepatic duct and hilum with non-visualization of the left IHD and gallbladder (Figure 3B). Some of the CBD stones may have passed out spontaneously, or migrated proximally, and these sequential changes may be responsible for the imaging findings of the PTC.

Fever and right upper quadrant pain rapidly resolved after broad-spectrum antibiotic treatment. The patient was referred for surgery with the clinical diagnoses of CBD stones and left intrahepatic cholangiocarcinoma. A left

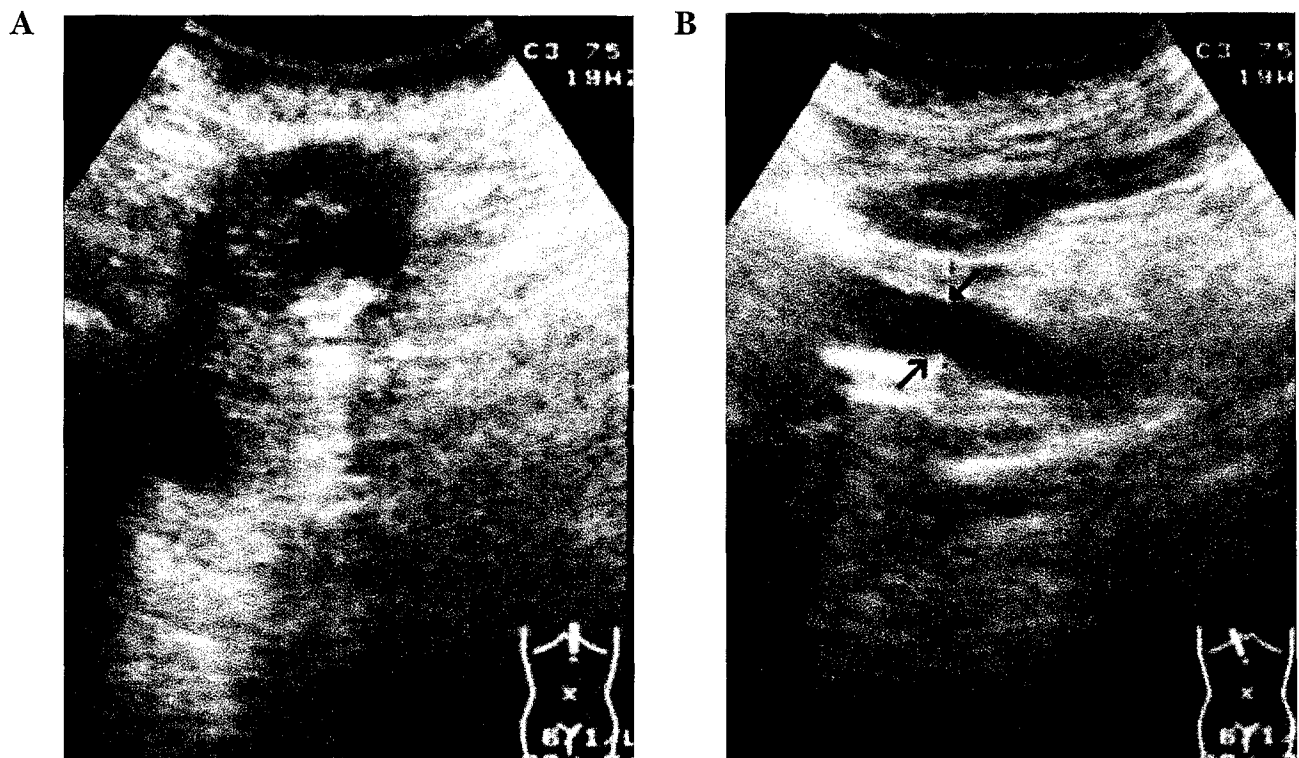


Figure 1. Sagittal abdominal ultrasound showing: (A) a mixed echoic mass lesion with acoustic shadowing within the atrophic left hepatic lobe (arrowheads); (B) the dilated common bile duct (arrows).

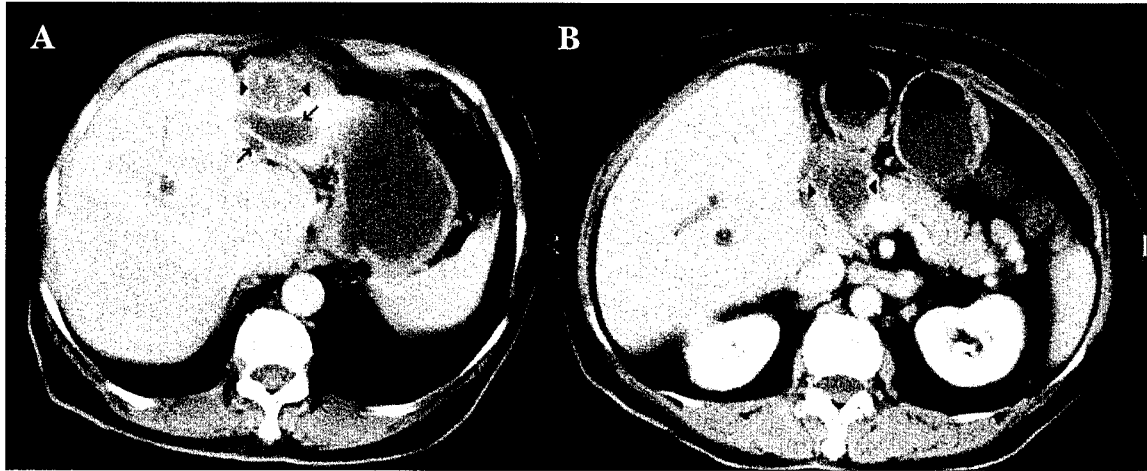


Figure 2. Enhanced computerized tomography shows: (A) an atrophic left hepatic lobe with dilated left intrahepatic ducts (arrows) and a bulging, poorly enhanced, low-density tumor mass with tiny calcified content (arrowheads); (B) the dilated common bile duct (arrowheads).

hepatic lobectomy and choledocholithotomy were performed without complication. Grossly, the specimen disclosed dilated IHD and CBD containing mucinous material. An ill-defined lesion measuring $5 \times 3 \times 2$ cm was noted. The lesion was a yellow-reddish tumor containing mucin. Microscopically, it showed cysts of varying sizes, with mucin pooling. The cysts were lined with biliary tract-type epithelium composed mostly of multilayered neoplastic cells with cellular and nuclear atypia, mitotic activity, and

invasion of underlying stroma. The pathologic diagnosis was a mucinous, intrahepatic biliary cystadenocarcinoma (Figure 4).

DISCUSSION

Biliary cystadenomas and their malignant counterparts, biliary cystadenocarcinomas, are rare tumors, accounting



Figure 3. (A) Endoscopic retrograde cholangiopancreatography reveals large filling defects in the dilated common bile duct. Biliary ducts proximal to the filling defect are not visible. The pancreatic duct is normal. (B) Post-endoscopic sphincterotomy percutaneous trans-hepatic cholangiography shows amorphous filling defects in the common hepatic duct and hilum with non-visualization of the left intrahepatic ducts and gallbladder.

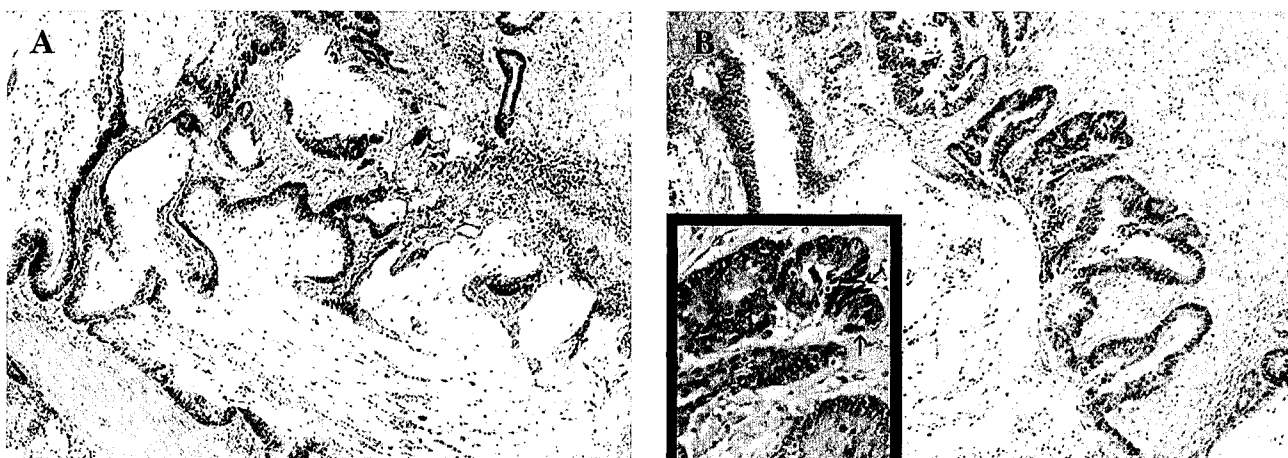


Figure 4. (A) Multiple cyst formation (hematoxylin & eosin, $\times 20$). (B) Tumor cells show cellular stratification with nuclear atypia, mitotic activity, and invasion of the underlying stroma (arrows) (hematoxylin & eosin, $\times 40$; inset, $\times 200$).

for less than 5% of bile duct origin neoplasms [1]. Biliary cystadenomas are characterized by dense connective tissue walls lined with a single layer of mucin-secreting cells but no evidence of atypia or excessive mitosis. Biliary cystadenocarcinomas are characterized by papillary projections with a multilayered cell lining with foci of dysplasia and moderate mitotic activity [2]. Biliary cystadenomas tend to occur in middle-aged women with a mean age of 50 years. Patients with malignant tumors are more than 10 years older than those with benign tumors [3]. Of the cystadenomas, 83% arise from the intrahepatic biliary system and 17% arise from the extrahepatic biliary system [4].

Typically, ultrasound and CT findings in biliary cystadenomas and cystadenocarcinomas are described as multilocular (rarely unilocular) cystic lesions with associated internal septations and nodularities [1]. Some authors suggest that the presence of nodules or coarse calcifications along the wall or septa favor the diagnosis of cystadenocarcinoma [1,3]. However, it is not crucial to distinguish biliary cystadenomas from cystadenocarcinomas preoperatively. Complete surgical excision is the preferred treatment for both tumors because of the premalignant nature of cystadenomas and to prevent metastasis in cystadenocarcinomas. On the other hand, biliary cystadenomas or cystadenocarcinomas must be differentiated from other cystic lesions of the liver that include simple cysts complicated by hemorrhage or infection, liver abscesses, hydatid cysts, and necrotic metastases. The distinction from predominantly solid neoplasms of the liver, such as more commonly encountered cholangiocarcinomas or hepatocellular carcinomas, is not usually difficult.

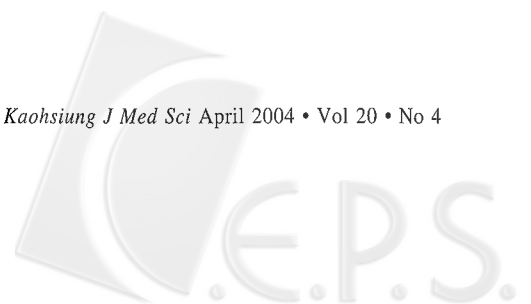
The characteristics of cholangiocarcinoma on ultrasound and CT include occupying lobule-like lesions in the edged area with low density and a blurred boundary encircled by dilated biliary ducts. Cholangiocarcinoma is often associated with atrophy of the affected lobe and hypertrophy of the unaffected lobe, the so-called atrophy-hypertrophy complex [5]. Many studies suggest that hepatic lesions associated with lobar atrophy and dilated IHD are suggestive of cholangiocarcinoma [6–8]. Lobar atrophy of the liver is a rare condition that is usually caused by obstruction of the biliary system or portal vein. Portal vein obstruction may be the predominant factor [7,9]. Takayasu et al report six cholangiocarcinoma patients with lobar atrophy and bile duct dilatation [7]. All patients had portal vein obstruction. In our present case, the cystic component of the left intrahepatic biliary cystadenocarcinoma was not predominant, and the margin of the tumor was not well defined because of its small size and association with lobar atrophy and dilated IHD. Furthermore, there were bilateral IHD and CBD stones, which are considered risk factors for cholangiocarcinoma [10]. As mentioned above, this caused some difficulties in the differential diagnosis with cholangiocarcinoma. The mechanism of left lobar atrophy in our case is not clear. It may have been due to compression of the left trunk of the portal vein secondary to hepatolithiasis and subsequent dilatation of the left hepatic ducts [11]. Wang et al reported that one of five patients with biliary cystadenoma or cystadenocarcinoma had IHD stones [12]. Lei et al reported cystadenoma with intracystic stone formation [13]. However, the causal relationship between hepatolithiasis and cystadenoma or cystadenocarcinoma is not clear.

One rare entity, mucin-hypersecreting bile duct tumor, should also be differentiated from biliary cystadenoma or cystadenocarcinoma. In mucin-hypersecreting bile duct tumors, the orifice of the major papilla always shows extrusion of mucoid material. Dilated intra- and extrahepatic bile ducts with amorphous filling defects are demonstrated by ERCP. Resected specimens are characterized by the presence of an intraductal tumor with a papillary surface comprising innumerable frond-like infoldings of proliferating columnar epithelial cells surrounding slender fibrovascular stalks [14,15]. The cystic lesions in mucin-hypersecreting bile duct tumors are basically those of dilated bile ducts. They are not true cysts with a closed cavity, as seen in biliary cystadenoma or cystadenocarcinoma. However, it may be difficult to differentiate biliary cystadenomas or cystadenocarcinomas, which are in direct continuity with the biliary tree, from mucin-hypersecreting bile duct tumors [16].

In conclusion, we report a rare case of biliary cystadenocarcinoma with unusual presentation. To our knowledge, this is the first report of a case of intrahepatic biliary cystadenocarcinoma associated with atrophy of the left hepatic lobe and hepatolithiasis mimicking intrahepatic cholangiocarcinoma.

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膽管囊腺癌合併肝左葉萎縮及肝內膽管結石擬似肝內膽管癌表現一病例報告

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膽管囊腺癌是一種由膽管長出來且好發於中年女性的罕見腫瘤，它的特徵是一個分泌黏液的多房性的囊狀腫瘤。影像學上，它與肝內實質腫瘤如肝癌、膽管癌等並不難區分，但必須和其他肝內囊狀腫瘤如肝囊泡合併感染或出血、肝膿瘍、壞死性轉移癌及包蟲囊腫做鑑別診斷。本文報導一影像學上擬似肝內膽管癌表現之膽管囊腺癌病例，並對此罕見病例及其不尋常之表現作文獻之回顧。

關鍵詞：膽管囊腺瘤；膽管囊腺癌；膽管癌

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