

Primary congenital choledochal cyst with squamous cell carcinoma: a case report

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Lili Wang^{1,*} , Xiaomei Ma^{1,*},
Dongdong Chen², Jialiang Ren³, Hua Cheng⁴,
Gang Huang¹ , Rong Wang¹ and
Jiarong Cheng⁵

Abstract

Cases of extrahepatic bile duct carcinoma are mostly adenocarcinomas and extrahepatic bile duct squamous cell carcinomas are rare. We report here a case of choledochal squamous cell carcinoma in a young woman who underwent surgery and chemotherapy. The woman presented with abdominal discomfort. A physical examination showed tenderness in the upper abdomen. Laboratory tests showed elevated direct bilirubin, total bilirubin, and C-reactive protein levels. Abdominal computed tomography and magnetic resonance imaging showed a cystic-solid mixed soft tissue mass in the common bile duct. Pain symptoms in the patient were not relieved and surgical treatment was performed. Postoperative pathological results showed a choledochal cyst complicated by squamous cell carcinoma. The patient was treated by biliary intestinal anastomosis followed by chemotherapy. However, the patient developed liver metastasis and recurrence at a 6-month follow-up. Primary congenital bile duct cysts with squamous cell carcinoma are extremely rare. Surgical resection is the main treatment option for choledochal squamous cell carcinoma. Postoperative chemoradiotherapy can be used, but the efficacy is poor and chemotherapy does not significantly prolong the patient's survival.

¹Department of Radiology, Gansu Provincial Hospital, Lanzhou, China

²Department of Surgery, Gansu Provincial Hospital, Lanzhou, China

³GE Healthcare China, Daxing District, Beijing, China

⁴Department of Radiology, Beijing Children's Hospital Affiliated to Capital Medical University, Beijing, China

⁵Gansu University of Traditional Chinese Medicine, Lanzhou, China

*These authors contributed equally to this work.

Corresponding author:

Gang Huang, Department of Radiology, Gansu Provincial Hospital, No. 204 Donggang West Road, Lanzhou 730000, China.

Email: keen0999@163.com



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Keywords

Bile duct, carcinoma, squamous cell, chemotherapy, choledochal cyst, liver metastasis

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Introduction

Congenital choledochal cysts are a type of choledochal cyst or fusiform ectasia, and it is a common congenital anomaly. Congenital choledochal cysts mainly occur in children, where 80% of cysts are usually diagnosed before the age of 10 years.¹ As a result of increasing awareness of this rare disease, the number of adult cases has increased. The prevalence rates of choledochal cyst in Western and Asian populations are 1/13,000 and 1/100,000, respectively.^{2,3} In this report, we describe an extremely rare case of a primary congenital choledochal cyst with squamous cell carcinoma. This patient underwent exploratory laparotomy, choledochenterostomy, and enteroenterostomy, followed by chemotherapy, but had recurrence and metastasis within 6 months, which indicated that chemotherapy had no effect on this disease.

Case report

A 32-year-old woman of Han ethnicity developed abdominal discomfort 6 months before admission to our hospital, with the symptoms worsening after eating. The patient presented with discomfort of the back, nausea, and abdominal pain after eating. She experienced no chills, fever, vomiting, jaundice, or weight loss, and visited a local secondary clinic. A large choledochal cyst was detected by endoscopic retrograde cholangiopancreatography. She was subsequently referred to our hospital for surgery. A physical examination showed tenderness in the upper abdomen,

a soft abdomen overall, no rebound pain, and an obvious abdominal mass. Upon admission, liver function and blood tests showed the following: serum alanine aminotransferase level, 5 IU/L (normal range, 5–40 IU/L); aspartate aminotransferase level, 28 IU/L (8–40 IU/L); alkaline phosphatase level, 750 IU/L (40–110 IU/L); direct bilirubin level, 21.3 $\mu\text{mol/L}$ (1.71–7 $\mu\text{mol/L}$); total bilirubin level, 35.1 $\mu\text{mol/L}$ (1.71–17.1 $\mu\text{mol/L}$); C-reactive protein level, 172.78 mg/L (0.4–5.2 mg/L); blood routine hemoglobin level, 104 g/L (110–150 g/L); lymphocyte count, 1.3×10^9 cells/L ($1.1\text{--}3.2 \times 10^9$ cells/L); white blood cell count, 10×10^9 cells/L; and international normalized ratio, 1.19 mm/hour (0–15 mm/hour). The levels of the tumor antigens carcinoembryonic antigen and alpha-fetoprotein were within the normal range. The patient provided signed informed consent for procedures to be performed.

Abdominal ultrasonography showed a tumor of the common bile duct cyst, which was located in the left wall of the common bile duct. Multiphase computed tomography (CT) showed common bile duct dilatation with a diameter of 7 cm. Enhanced CT showed that the soft tissue tumor was unevenly enhanced during the arterial phase (Figure 1a). Magnetic resonance imaging (MRI) displayed a solid lesion, which was located in the left lateral wall of the cyst, and showed uniform low- and high-signal intensities on T1- (T1WI) and T2- (T2WI) weighted images, respectively (Figure 1b). Moreover, MRI showed high-signal intensity on diffusion-weighted imaging, and

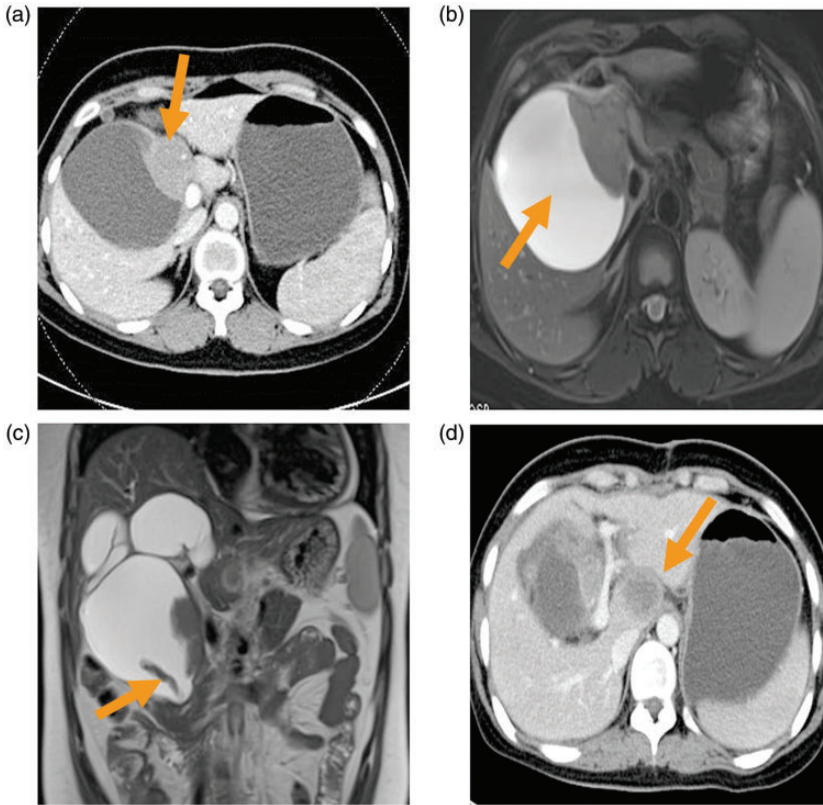


Figure 1. a: Magnetic resonance imaging shows a soft tissue tumor mass that is enhanced during the arterial phase. Blood vessels can be seen in the lesion (orange arrow). b: A solid lesion is located in the lateral wall of the cyst, showing equal signal intensity on the anti-lipid sequence. The cystic component (indicated by the orange arrow) is hyperintense. c: The orange arrow indicates an iso-T2 signal in the cystic lesion. The extrahepatic bile duct shows dilatation. d: The focus recurred, and new lesions can be seen in the caudate lobe of the liver (orange arrow).

low-signal intensity on the apparent diffusion coefficient map. Additionally, ribbons of high- and low-signal intensities were found on T1WI and T2WI, respectively, in the cyst (Figure 1c). The case was diagnosed and analyzed by two deputy chief doctors. The diagnosis was considered as a choledochal cyst that was complicated by a tumor. No metastatic signs were found when craniocerebral MRI, chest X-ray, abdominal CT, MRI, and other examinations were performed.

Oxycodone and acetaminophen tablets were administered orally before surgery,

but the patient's symptoms were not relieved. Therefore, an operation was carried out. Three days after admission, three surgeons performed exploratory laparotomy, choledochenterostomy, and enteroenterostomy under general anesthesia. Perioperatively, common bile duct expansion was observed in the upper section, with a solid, qualitatively hard tissue mass in the lower section and it was tightly adherent to the surrounding tissue. A biopsy from the tumor was pathologically analyzed. The common bile duct was resected, and the jejunum with a distance

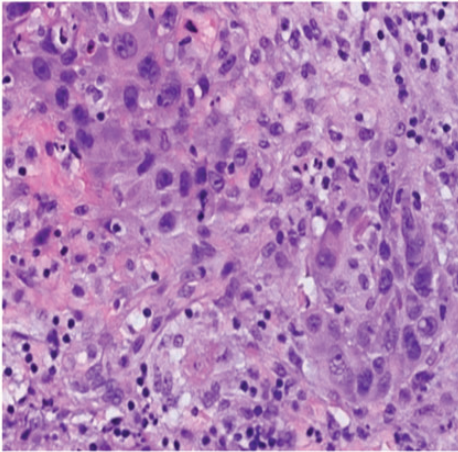


Figure 2. Histopathology shows abnormal cells with large nuclei, deep staining, and irregular nuclei in the stained section. There is also small nucleoli, red staining of the cytoplasm, and inflammatory cell infiltration (hematoxylin and eosin staining; original magnification, $\times 100$).

of 50 cm from the Treitz ligament was cut at the proximal end. Choledochal jejunostomy was then performed and the biliary tract was reconstructed. No obvious enlarged lymph nodes were found. A pathological examination of the excised tissue showed that the squamous cell carcinoma had scattered distribution of heteromorphic epithelial cells. These cells had an irregular karyotype, and were clearly split with overt nucleoli, visible pathological fission, an abundant cytoplasm, and visible intercellular bridges, but no keratin pearls (Figure 2). The patient was diagnosed with squamous cell carcinoma of the bile duct. There were no lesions in the patient's lungs, gastrointestinal tract, or uterus. Therefore, primary squamous cell carcinoma of the bile duct was diagnosed by histopathology. The patient received postoperative chemotherapy with gemcitabine (1000 mg/m^2) and cisplatin (75 mg/m^2). Based on the patient's body surface area (1.8 m^2), the first course of

treatment was 21 days, with an interval of 3 weeks after the next course of treatment, and this lasted for six courses.

The patient was followed up for 6 months and abdominal CT showed recurrence. There were new lesions in the caudate lobe of the liver, which indicated liver metastasis (Figure 1d).

Discussion

Squamous cell carcinoma is also referred to as epidermoid carcinoma. The majority of cases of cholangiocarcinoma are hepatic hilar cholangiocarcinomas. More than 90% of extrahepatic cancers involve adenocarcinomas.⁴ However, primary squamous cell carcinoma of the extrahepatic bile duct is rare, and only 2% of biliary carcinomas are of squamous cell origin,⁵ with only a few cases reported in approximately 100 years.⁶⁻⁸

Kohno et al.⁹ suggested that squamous cell carcinoma is derived from adenocarcinoma. However, Cabot et al.¹⁰ developed a theory suggesting that inflammatory stimulation is the main cause of metaplasia in epithelial mucous membranes. Sewkani et al.¹¹ proposed that squamous cell carcinoma is caused by choledochal cysts and sclerosing cholangitis. In previously reported cases of a primary congenital bile duct cyst with squamous cell carcinoma, some patients had coexisting congenital choledochal cysts and/or bile duct stones. Therefore, "inflammation-cancer" transformation might occur in patients with congenital choledochal cysts or stones, and a few cases could develop primary squamous cell carcinoma of the bile duct.¹²

MRI features depend on the composition of the tumor. After injection of gadolinium diethylenetriaminepentaacetic acid contrast agent, most tumors show low- and high-signal intensities on T1WI and T2WI, respectively. Additionally, some masses display low-signal intensity on

T2WI, high-signal intensity mainly on T1WI, or mixed signal intensities on both T1WI and T2WI. The main points of diagnosis of congenital choledochal cyst with squamous cell carcinoma include the following. First, this disease is more common in children and young individuals. Second, if a choledochal cyst is complicated by a solid mass and the patient is younger than 20 years, carcinogenesis is highly likely. Third, a solid mass is seen on the wall of the choledochal cyst, and shows high-signal intensity on DWI. Fourth, a choledochal cyst complicated by stones easily becomes cancerous.

This type of carcinoma shows a high degree of malignancy, widespread destruction, and lymph node involvement through lymphatic metastasis around the bile duct, which may lead to systemic metastasis. CT and MRI scans are helpful for determining relevant characteristics of these tumors, including nidus number, position, and invasion of surrounding tissues. In case a lesion is suspected to be malignant, a biopsy or even surgical resection should be performed. Although prognosis of choledochal squamous cell carcinoma may be unfavorable, these approaches are considered the best treatment options. The degree of malignancy of this disease is high, and the prognosis of patients with incomplete operation or metastasis is poor. Recurrence and metastasis occurred 6 months after the operation in our patient. This finding indicates that chemotherapy does not significantly prolong the survival time in this disease, which is in disagreement with a report by Goto et al.⁸ Several observational series have suggested that postoperative radiotherapy may also prolong survival from cholangiocarcinoma.¹³

Conclusion

We report a rare case of squamous cell carcinoma arising within a choledochal cyst.

Our findings suggest that this type of cancer can originate from congenital cystic disease. This type of cancer shows a high degree of malignancy, and chemotherapy does not significantly prolong the patient's survival.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.


Ethics statement

Written informed consent was obtained from the patient for publication of this case report and its accompanying images. All procedures performed were in accordance with the ethical standards of the institutional and national research committee. This study was approved by the Ethics Committee of Gansu Provincial Hospital (No. 2019-086).

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ORCID iDs

Lili Wang  <https://orcid.org/0000-0003-4576-3776>

Gang Huang  <https://orcid.org/0000-0001-6057-5349>

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