Hepatocellular carcinoma arising from left accessory liver lobe supplied by the branch of left hepatic artery

A case report

Xiaolong Wang, MD, Qingqiao Zhang, PhD, Kai Xu, PhD

Abstract

**Introduction:** Accessory liver lobe (ALL) is a rare congenital anomaly. ALL combined with hepatocellular carcinoma (HCC) is even rarer. Most ALLs with HCC are often located in the right liver, and are not supplied by the left hepatic artery.

**Patient concerns:** A 77-year-old man was referred to our hospital because of the level of serum alpha-fetoprotein (AFP) continually increased for 1 month. He had no history of chronic hepatitis, alcohol abuse, or cirrhosis of the liver.

**Diagnoses:** Preoperative computed tomography (CT) scan revealed a 3.0 × 3.0 × 1.0 cm ovaloid-shaped solid mass in the left subphrenic area with isodensity. Magnetic resonance imaging (MRI) showed a mass with a heterogeneous signal on T1- and T2-weighted images. On contrast-enhanced CT and MRI, the mass showed a pattern of early enhancement and washout. Digital subtraction angiography (DSA) confirmed the mass was fed by the branch of left liver artery.

**Interventions:** The mass was treated by transatheter arterial embolization (TAE) followed by surgical resection. Histopathologically showed HCC, consistent with a moderately differentiated.

**Outcomes:** Follow-up of 3 months after surgery, the level of AFP returned to normal gradually.

**Conclusions:** In this report, we describe a rare case of ALL with HCC, located in the left subphrenic area, especially which was supplied by the branch of left hepatic artery has rarely been described. The clinical presentation, radiological features are described in the literature.

**Abbreviations:** AFP = alpha-fetoprotein, ALL = accessory liver lobe, CT = computed tomography, DSA = digital subtraction angiography, HCC = hepatocellular carcinoma, MPR = multiplanar reconstruction, MRI = magnetic resonance imaging, PET-CT = positron emission tomography-computed tomography, TAE = transatheter arterial embolization.

**Keywords:** accessory liver lobe, hepatocellular carcinoma, left hepatic artery, surgery, transcatheter artery embolization

1. Introduction

Accessory liver lobe (ALL) is morphologic variations of the liver and attached to the mother liver by bridge of hepatic tissue, a

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mesentry or stalk. ALL can be distinguished from ectopic liver based on whether there is a connection to the mother liver.[1,2] In previous reports, ALLs have been found to originate from the right, left, caudate lobe, or the gallbladder.[3] The incidence of ALL was 0.09% and ALL with hepatocellular carcinoma (HCC) was even rarer.[4] Up to now, most ALLs with HCC were located in the right liver and supplied by the right hepatic artery or the inferior phrenic artery.[5] However, few reports demonstrated ALL with HCC was located in left subphrenic area and connected with the left lobe of the liver through a pedicle. In this report, we described a rare case of ALL with HCC connected with the left liver lobe by a thin pedicle, and fed by the branch of left hepatic artery. The ALL with HCC was treated by transatheter arterial embolization (TAE) followed by surgical resection.

2. Case report

A 77-year-old man was referred to our hospital because of the level of serum alpha-fetoprotein (AFP) continually increased for 1 month. He had no history of chronic hepatitis, alcohol abuse, or cirrhosis of the liver. The patient had no fever, chills, abdominal pain, or appetite loss with nausea and vomiting. Physical examination showed normal findings. Except AFP, the other tumor marker levels in the serum were within the normal range. His blood chemistry showed no infection with hepatitis B and C virus, and liver and kidney function were normal.
On admission in June 2017, laboratory tests revealed that his serum AFP value was 212.37 ng/mL (normal range: 0–9 ng/mL). Abdominal plain CT demonstrated an ovaloid-shaped solid mass in the left subphrenic area just adjacent to the fundus of gastric and spleen with isodensity, well defined, and there was no remarkable abnormality in the mother liver (Fig. 1A). A contrast-enhanced helical CT scan showed the mass was heterogeneous and mild-to-moderate enhanced in the hepatic arterial phase (Fig. 1B). In the portal phase, part of the lesion, the degree of enhancement reduced, the pattern of enhancement different from spleen (Fig. 1C). The mass was slightly hypointense on T1-weighted MR images and slightly hyperintense on T2-weighted images, which was similar with the signal intensity of spleen. After the administration of contrast medium (gadopentetate dimeglumine [Magnevist, Schering]), the mass revealed a mild enhancement in the hepatic arterial phase, in the portal phase and delay phase, enhanced degree of the mass was slightly higher than the spleen (Fig. 2A). MRI multiplanar reconstruction (MPR) showed that the mass was connected to the surface of the lateral edge of the left hepatic lobe by a thin pedicle contained blood vessels, and the adjacent partial diaphragm was enhanced, measuring approximately $3.0 \times 3.0 \times 1.0$ cm (Fig. 2B).

In September 2017, the level of serum AFP started rising up to 327.71 ng/mL. Because of the mass adjacent to fundus of gastric, to excluding some special gastric carcinoma, gastroscopy examination was performed and showed a protuberant lesion in the fundus of gastric, but the gastric mucosal tissue kept intact.

In October 2017, the level of serum AFP started rising up to 476.00 ng/mL. DSA was performed. Selective angiography of proper hepatic artery showed the right hepatic artery was normal and there was no tumor staining in the mother liver. Super-selective left hepatic artery angiography demonstrated a tumor staining beneath the left diaphragm, which was fed by the branch of left hepatic artery (Fig. 3A). Then 2 mL iodized oil was injected through a 2.7 F microcatheter to embolize the branch of left hepatic artery. One week after the treatment, CT scan of abdomen revealed lipiodol deposition densely in the lesion (Fig. 3B).

Two weeks after the interventional treatment, the patient underwent surgical operation. Operation findings showed the mass located at lateral of the left liver lobe and connected with the left liver parenchyma by a thin pedicle. The mass was grayish white, invaded the left diaphragm and adhere to the omentum of greater curvature of gastric, the contour of the mother liver and
its surface was normal. The mass and adjacent diaphragm was resected, and the resected specimen was histopathologically hepatocellular carcinoma, consistent with a moderately differentiated HCC (Fig. 4).

During follow-up of 3 months after surgery, the level of AFP returned to normal gradually.

3. Discussion

ALL is defined as morphologic variations of the liver and composed of normal liver parenchyma in continuity with the mother liver, in contrast to ectopic liver that has no anatomical continuity with the normal liver. ALLs have been reported to originate from the right, left, caudate lobe, ligaments of hepatic, gallbladder.[3,4,6–8] Even it can be located in the thoracic cavity mimicking a pulmonary tumor or intracaval.[9,10] However, most of them were located in the right liver and below the liver.[3] Few reports demonstrated extrahepatic HCC locate at lateral of left liver lobe.[5,11–14] Part of them laparotomy disclosed no connection between the tumor and the left hepatic lobe.[5,11] Only very few cases confirmed that had a stalk or pedicle between the tumor and the liver.[12,13] Even so, the tumor was capsulated,
no invasion to the diaphragm or spleen was observed. In our case, the mass between the left diaphragm and the spleen, connected with the left liver lobe by a thin pedicle, but the tumor invaded the left diaphragm. Accordingly, our case conform to HCC arising from accessory lobe of left liver.

Most ALLs with HCC cases are clinically silent, the clinical and imaging features of ALL with HCC lack of specificity relatively. Therefore, The preoperative imaging examinations were often misdiagnosed.\(^\text{[12,13]}\) Up to now, diagnosis is commonly verified by CT scans, MR tomography, or ultrasound,\(^\text{[14]}\) but CT, MR, and angiography findings of ALL with HCC have not been described in detail in one report in previous reports. In a few reports, plain CT showed a slightly lobulated, round, soft tissue mass with isodensity and partial low density.\(^\text{[16,17]}\) Helical dynamic CT revealed contrast enhancement in the hepatic arterial phase and became less dense than the liver parenchyma in dynamic CT revealed contrast enhancement in the hepatic arterial phase and washout, consistent with original HCC. Moreover, in this case, MR imaging demonstrated clearly a mass connected to the surface of the lateral edge of the left lobe by a thin pedicle contained blood vessels, it is important for the preoperative diagnosis. Digital subtraction angiography (DSA) confirmed ALLs with HCC are hypervascular lesion.\(^\text{[15]}\) Sixteen patients of ALLs with HCC or ectopic liver with celiac angiography results were analyzed comprehensively by Arakawa et al.\(^\text{[18]}\) The tumor was supplied by a branch of the right hepatic artery in 2, left hepatic artery in 2, and in 12 the feeding artery was not a branch of the hepatic artery. In our cases, DSA finding confirmed the mass was fed by the branch of left liver artery, and the mass was treated by transcatheter arterial embolization (TAE). There was so little literature aiming at PET/CT finding about ALL with HCC, Hsu et al.\(^\text{[14]}\) reported although FDG PET/CT is an excellent modality in detecting a variety of hepatic pathologies, the sensitivity in the early detection of hepatocellular carcinoma is suboptimal. In comparison, \(^\text{18}^{11}C\)-acetate PET/CT is more accurate in this clinical setting.

At present, there is no proof that ALLs with HCC are more frequent in patients with cirrhosis.\(^\text{[15]}\) Whether ALLs appeared to be at an increased risk of undergoing hepatocarcinogenesis cannot be determined, but there are few reports about ALLs associated with the benign lesions, such as focal nodular hyperplasia.\(^\text{[19]}\) Some experts suggested that ALLs should be removed before running into HCC, however, long-term follow-up data are poor. Review of the existing literatures, surgeon had recommended a laparoscopic. Interventional embolization of the feeding artery of ALLs with HCC has not been reported, this paper offers a new idea to treat the disease. In addition, Arakawa et al.\(^\text{[18]}\) noted that serum AFP levels were higher than 1000 ng/mL in 12 of 19 ALLs or ectopic liver with HCC cases (63%). When the level of serum AFP continually increased, there was no remarkable abnormality in the mother liver, although rare, ALL or ectopic liver with HCC should be borne in mind.

In summary, not only a multidetector spiral CT and magnetic resonance imaging scan with multiplanar reconstruction can reveal the location of the mass relation to the normal liver parenchyma, but also are useful to reveal if the hepatic vessels extend to the mass, it is important for the radiologist to be aware, the diagnosis of an accessory liver lobe is more definitive. When the level of serum AFP continually increased, there was no remarkable abnormality in the mother liver, although rare, ALL or ectopic liver with HCC should be taken into consideration. In addition, if preoperation the level of serum AFP was abnormal, and after the operation follow-up AFP is recommended.

**Author contribution**

Project administration: Kai Xu.

Supervision: Qingqiao Zhang.

Writing – original draft: Xiaolong Wang.

Writing – review & editing: Xiaolong Wang.

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