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Case Report

Complete surgical resection and chemotherapy of diffuse large B-cell lymphoma in the liver and small omental capsule: a case report

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Abstract: A 56-year-old patient presented with a large B-cell lymphoma in the left liver and small omental capsule with normal α-fetoprotein and carcino-embryogenic antigen levels. After complete surgical resection, the pathologic examination showed a non-Hodgkin's lymphoma (diffuse large B-cell lymphoma). Chemotherapy with R-CHOP was administered after the surgical procedure. The patient is currently living with a healthy condition for seventeen months. Thus, complete surgical resection combined with chemotherapy may be an effective treatment approach for primary hepatic lymphoma.

Keywords: Liver, lymphoma, surgery, chemotherapy

Introduction

Non-Hodgkin's lymphoma in the liver (primary hepatic lymphoma [PHL]) is rare and accounts for 0.016% of all non-Hodgkin's lymphomas [1]. Liver and small omental capsule involvement is even more rare for PHLs. The clinical manifestations often include hepatomegaly, liver function abnormalities, and hepatic failure [2]. In some cases, PHL can be misdiagnosed as primary liver carcinoma, hepatitis, or a benign tumor because of the lack of specific clinical features, imaging characteristics, and laboratory findings [3]. There is no standard treatment procedure for PHLs; however, surgical resection, radiationtherapy, and chemotherapy are available options. Complete surgical resection combined with R-CHOP chemotherapy was performed in the current case.

Case presentation

In 2013, an abdominal computed tomography (CT) scan revealed a solid lesion in the left lobe of the liver of a 56-year-old male who was undergoing a physical examination at The Hospital of Traditional Chinese Medicine of Dali. The volume of the mass increased and a new mass was detected by a CT scan 1 month later. The patient was asymptomatic, with no complaints of fevers, chills, sweats, and nausea. At the Second Affiliated Hospital of Kunming Medical University, an abdominal and pelvic CT scan showed multiple solid hypodense masses on the left liver and small omental capsule (**Figure 1A**). A contrast-enhanced CT scan detected multiple solid hyperdense lesions with a size of 12.5×9.0×11.40 cm in the left liver, and another tumor measured 9.5×9.1×8.1 cm in the small omentum (**Figure 1B**). Three-dimensional angiography of the portal vein system using a 256-slice Intelligene CT (Philips Medical Systems, USA) with iopromide (Bayer Guangzhou Branch, Guangzhou, China) showed that the celiac trunk and common hepatic artery were wrapped in the tumor of the small omental capsule (**Figure 1C** and **1D**).

The clinical examination showed hepatomegaly (5 cm inferior to the xiphoid as well as the left costal margin). The liver was hard and tender, having an irregular surface on the anterior midline and left costal margin. There was no palpable superficial lymphadenopathy. Viral sero-

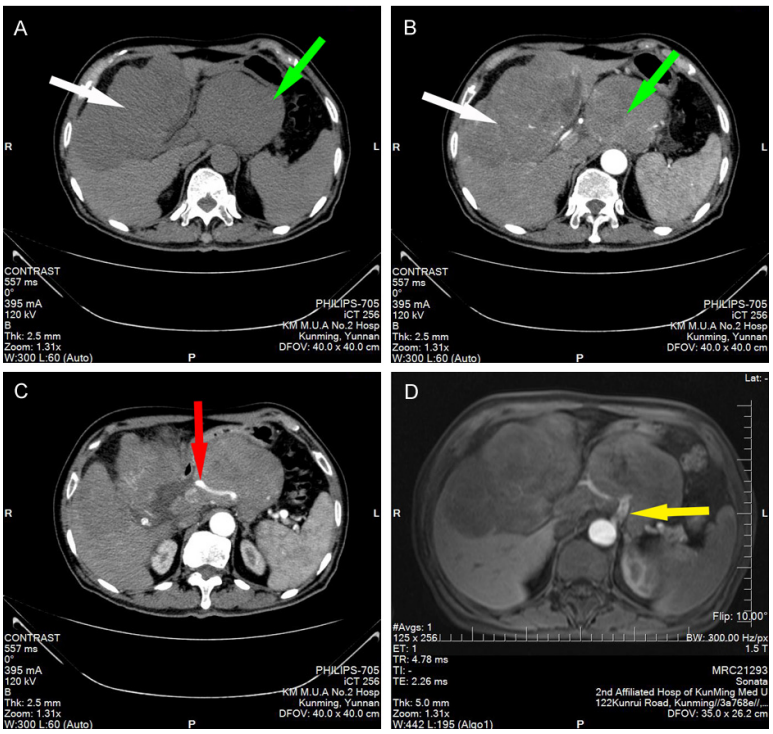

Figure 1. Pre-operative abdominal CT scans: (A): A low-density lesion in the left liver (white arrow) and small omental capsule(green arrow); (B): A high-density lesion in the same place after enhancement; (C and D): Enhanced CT and MRI showed that the common hepatic artery (red arrow) and celiac trunk (yellow arrow) were encapsulated in the tumor of the small omental capsule.

logic tests were negative for hepatitis B, hepatitis C and human immunodeficiency viruses. The liver function tests and blood cell count were normal.

A surgical procedure was performed after a multidisciplinary team discussion. During the surgery, the tumor was noted to be large and the boundary was unclear (**Figure 2A**). We found that the mass was confined to the left lobe of the liver and small omental capsule; the other one-half of the liver was healthy. An anatomic left hepatectomy was performed and complete resection of the mass on the small omental capsule (**Figure 2B**) with celiac trunk and common hepatic artery sheath stripped. The appearance of the profiles was solid and tough, and the color of the mass was gray (**Figure 2C**). An intra-operative pathologic examination showed a section near the right lobe of the liver without aberrant liver cells. Immuno-histochemical staining revealed large, round cells (**Figure 2D**). The cells were positive for CD20 and CD3 antibodies (**Figure 2E** and **2F**). A diagnosis of diffuse large B-cell was established. Subsequently, a bone marrow biopsy was performed, which revealed no evidence of tumor involvement. A post-operative abdominal CT scan showed right portal vein branch, celiac, common hepatic artery were well preserved (**Figure 3A** and **3B**). After a multidisciplinary team discussion, the patient was administered R-CHOP (rituximab, 375 mg/m^2; cyclophosphamide, 750 mg/m^2; vincristine, 2 mg; doxorubicin 50 mg/m^2 intravenously; and prednisolone, 40 mg/m^2 orally) every 21 days. The patient is currently healthy and continues with regular follow-up evaluations.

Discussion

Based on the history and pathologic examination, a diagnosis of primary diffuse large B-cell lymphoma of the liver with extra-hepatic infiltration was established. Non-Hodgkin's lymphoma is a common malignancy, and PHL is an extra nodal lymphoma of the liver without splenic, lymph node, or other lymphoid organ involvement [4]. In our case, small omental capsule was involved. Approximately one-fourth of NHL patients present with an extra nodal origin, of which liver involvement represents approximately 10% with an advanced stage of the disease [5, 6]. PHL is extremely rare, occurring at approximately 1% of lymphomas [1, 7]. Patients with PHL often present with hepatomegaly, right upper quadrant pain, and hepatic failure [8]. Currently, the etiology of PHL is not clear. However, hepatitis C and human immunodeficiency viruses are implicated in the pathogenesis of PHL [7, 9, 10]. Recent evidence suggests that hepatitis B or Epstein-Barr virus infection are keys factors in the pathogenesis of PHL [9]. In the current study, the laboratory test results of the viral markers were negative. PHL can also occur in patients without viral infections.

For our patient, the space-occupying lesion presented as a large mass in the left liver and

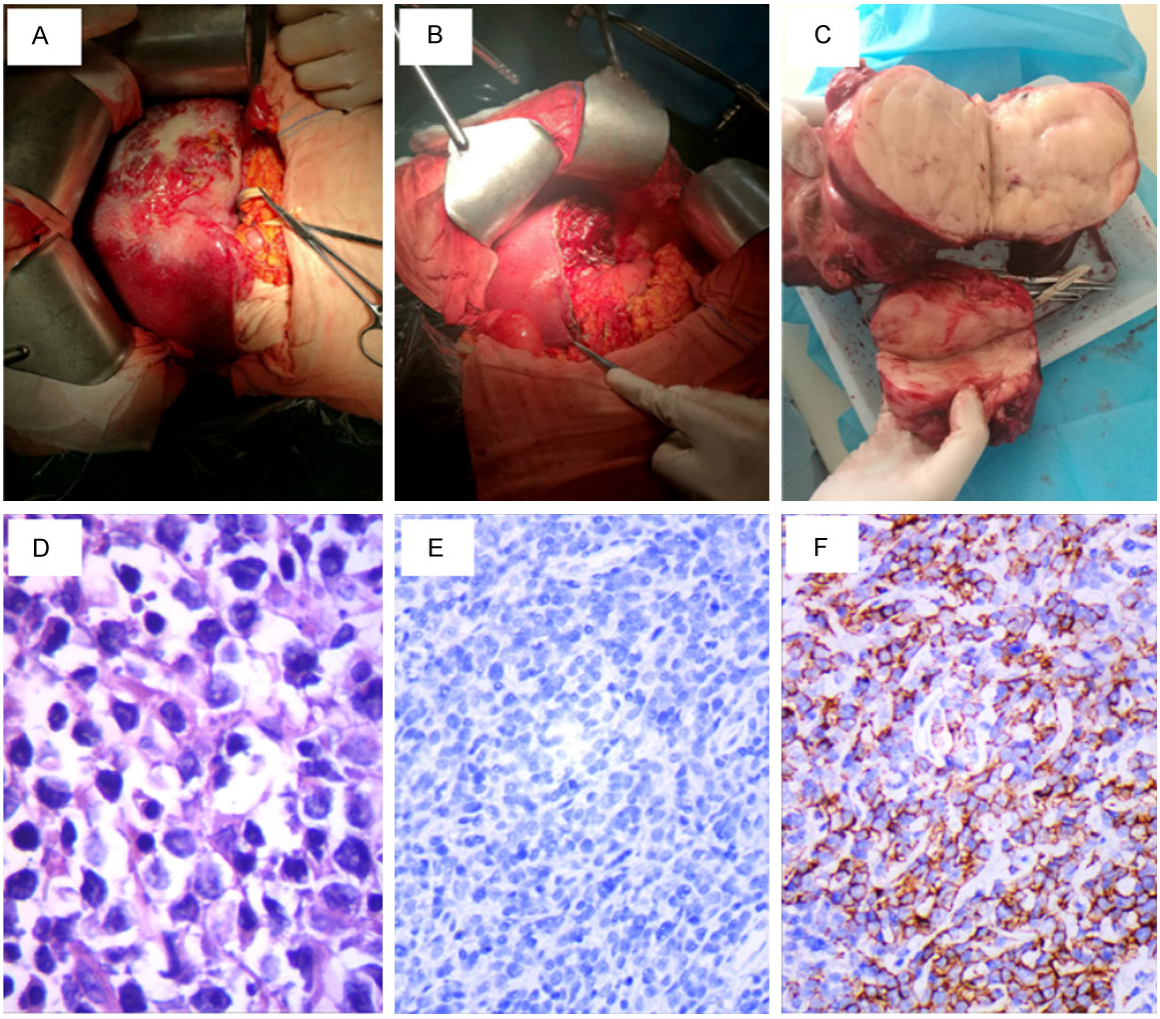

Figure 2. A. The mass in the left liver was large and the boundary was unclear; B. The lesion was resected completely, and the remainding liver was healthy; C. The color of the tumor was gray and the surface of the section was solid; D. Surgical resected of the lesion for HE staining showed large B lymphocytes were large and round (H&E, 400×); E. Anti-CD3 staining is negative (200×); F. Positive anti-CD20 staining (brown yellow) is shown (200×).

small omental capsule. The CT and MRI findings were suggestive of primary hepatocellular carcinoma with extra hepatic metastasis. PHL has non-unique imaging features, and may even mimic other benign or malignant hepatic tumors. Lymphomatous deposits may be noted as hypoechoic nodules or lesions with the appearance of a target on ultrasonography. On non-contrast CT the lesion appeared as a low-density mass, and a marginally or internally-enhanced mass on contrast-enhanced CT. MRI usually reveals diffuse hypointense lesions on T1-weighted images, and hyperintense lesions on T2-weighted images. Therefore, a definite diagnosis of PHL based solely on imaging is difficult to establish.

The standard treatment for PHL has not been established. Surgical treatment, radiotherapy, and chemotherapy used alone or in combination have been reported [11-13]. A study pointed out that chemotherapy and radiotherapy combined may be beneficial for patients with PHL [3]. It has been suggested that surgical treatment may result in longer survival than chemotherapy, especially for localized tumors that can be completely resected [14]. In contract, another clinical study shows that comprehensive treatment has a better prognosis for patients with PHL [3]. In the present case, we performed a complete surgical resection and administered R-CHOP chemotherapy, resulting in complete remission; however, which treat-

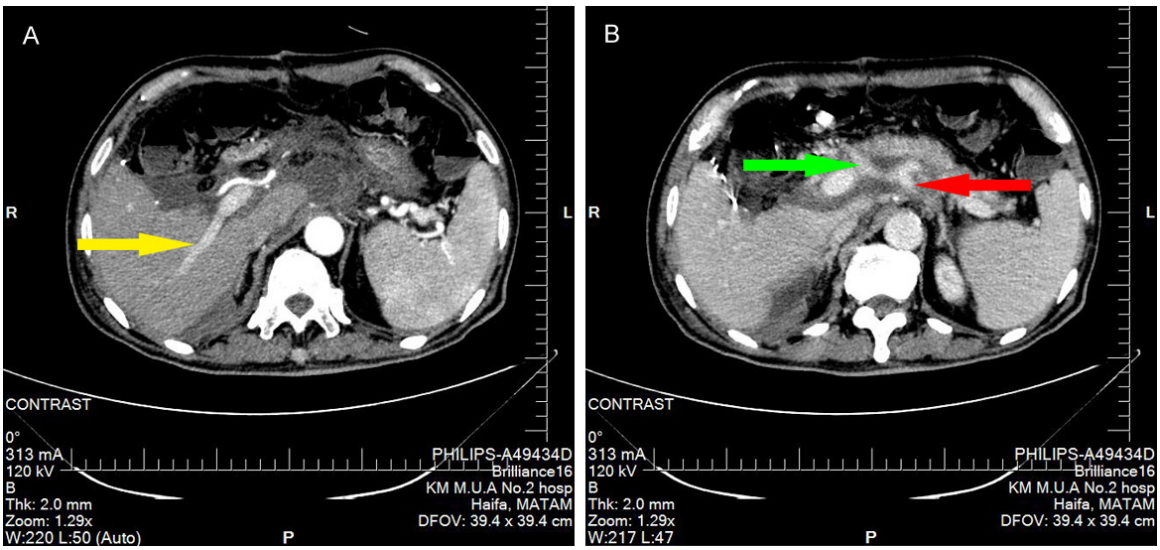

Figure 3. Post-operative CT scan showed Right portal vein branch (yellow arrow), celiac (green arrow), common hepatic artery (red arrow) were well preserved.

ment approachis more efficacious for PHL warrants further clinical research. In our case, radical surgery plus chemotherapy yielded a positive clinical response.

In conclusion, PHL is a rare disease without specific imaging findings, clinical manifestations, or biochemical indicators. The diagnosis is difficult in some cases, where the liver alone is involved with no splenic, lymph node, and lymphoid organ involvement. When multiple solid lesions are found in the liver, but no other organ involvement, and the levels of alpha-fetoprotein and carcino-embryonic antigen are normal, PHL should be suspected. If PHL is diagnosed, an effective personalized treatment should be undertaken. Surgical treatment and therapeutic drugs may be a good choice to achieve a better prognosis.

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Disclosure of conflict of interest

None.

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