Primary Hepatic Liposarcoma Diagnosed by Dynamic Computed Tomography

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ABSTRACT

Primary hepatic liposarcoma is extremely rare and only a few cases have been reported in the English literature. Here, we report a case of myxoid-type primary hepatic liposarcoma in a 63-year-old man presenting with low back pain. Before surgery, dynamic abdominal computed tomography (CT) revealed a well-marginated mass in the left lobe of the liver with a fat component. There was no enhancement of the fat component and only mild delayed enhancement of the soft-tissue component after the administration of contrast. The pathological diagnosis was a myxoid liposarcoma of liver. The patient was doing well at least five years after a left segmentectomy of the liver. A CT study was used preoperatively in the diagnosis of a hepatic liposarcoma and was helpful in differentiating the liposarcoma from other fat-containing tumors.

Fat-containing tumors of the liver are uncommon entities. Among these, hepatic liposarcoma is an exceedingly rare tumor. Metastatic spread of soft tissue liposarcoma is relatively common, but the liver is involved in only 10% case [1-3]. Only a few cases of primary liposarcoma have been reported (Table 1). Imaging modalities are used to analyze the characteristics of the tumor. We report a case of primary hepatic liposarcoma followed for more than five years after surgery and discuss the possible preoperative diagnosis of this type of hepatic tumor on dynamic computed tomography.

CASE REPORT

A 63-year-old man presented with low back pain radiating to the thigh for two months. Magnetic resonance imaging (MRI) of the lumbar spine showed bulging of the L4/5 disk with compression of the right nerve root. However, a fat-containing tumor was incidentally found in the left lobe of the liver. His past history included hypertension and diabetes mellitus, both controlled with medication for 10 years. He had no other risk factors for liver disease, such as viral hepatitis or cirrhosis. A physical examination of the abdomen showed a soft and flat abdomen, with no palpable mass or tenderness. Laboratory tests showed blood urea nitrogen = 43 mg/dL (normal: 6-20 mg/dL) and creatinine = 1.7 mg/dL (normal: 0.7-1.2 mg/dL). Other laboratory data, including liver function test, α-fetoprotein, and other tumor markers, were within the reference ranges. Viral markers for hepatitis B and C were negative. Dynamic computed tomography (CT) of the abdomen revealed a well-defined encapsulated fat-containing mass of about 8 cm × 8.5 cm × 9 cm in the lateral segment of the left lobe of the liver (Fig. 1). The mass showed a predominant fat component and some soft-tissue component. During dynamic study, the fat...
component within the lesion showed no significant enhancement from the arterial phase to the delayed phase. The soft-tissue component showed mild delayed enhancement. These characteristics are suggestive of a hepatic liposarcoma. An exploratory laparotomy with lateral segmentectomy of the left lobe of the liver was subsequently performed. The gross specimen showed a yellow–brown–gray tumor with a soft, gelatinous consistency. Microscopically, sections of tumor indicated a myxoid liposarcoma, characterized by a hypocellular myxoid lesion mixed with mature adipose tissue, lipoblasts, and a rich chicken-wire-type capillary network (Fig. 2). Serial follow-ups with ultrasound and CT over five years revealed no evidence of tumor recurrence or metastasis.

**DISCUSSION**

Lipomatous tumors of the liver are not frequently encountered in the clinical context. Hepatic liposarcoma is one of the exceedingly rare lipomatous tumors. Most liposarcomas in the liver are metastases, which usually originate from malignant primary tumors elsewhere (Table 1). The histopathological characteristics of hepatic liposarcoma are variable. A review of the literature revealed that most hepatic liposarcomas are ill-defined, do not enhance, and are iso- to hypodense on CT scans. Many cases are accompanied by hepatic or portal vein thrombosis. The indistinguishability of primary and metastatic liposarcoma may lead to diagnostic challenges. The diagnosis of hepatic liposarcoma is based on the clinical, radiographic, and histopathological findings. A high index of suspicion is required to make a correct diagnosis. The differential diagnosis includes other liver tumors, such as hemangioma, angiosarcoma, metastases, abscesses, and lymphangioma. Dynamic CT in diagnosing hepatic liposarcoma

<table>
<thead>
<tr>
<th>Author/year</th>
<th>Age/sex</th>
<th>Location</th>
<th>Diameter (cm)</th>
<th>Clinical signs and symptoms</th>
<th>CT findings</th>
<th>Type</th>
<th>Prognosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolloch/1973 [4]</td>
<td>22/F</td>
<td>right lobe</td>
<td>NA&lt;sup&gt;a&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
<td>myxoid</td>
<td>survival 46 days</td>
</tr>
<tr>
<td>Kim/1985</td>
<td>86/M</td>
<td>liver capsule</td>
<td>NA</td>
<td>RUQ&lt;sup&gt;b&lt;/sup&gt; pain, massive ascites, and pleural effusion</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Kim/1987 [12]</td>
<td>30/F</td>
<td>left lobe</td>
<td>14 x 10 x 6</td>
<td>abdominal pain</td>
<td>CT: exophytic</td>
<td>dedifferentiated</td>
<td>tumor-free for at least 10 months</td>
</tr>
<tr>
<td>Arifal/1993</td>
<td>48/F</td>
<td>hilum</td>
<td>NA</td>
<td>intermittent right-sided abdominal pain</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Khan/2000 [9]</td>
<td>50/M</td>
<td>right lobe</td>
<td>23.9 x 19 x 14</td>
<td>right hypochondrium pain for 6 months</td>
<td>CT: fat density, exophytic</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Nelson/2001 [1]</td>
<td>54/F</td>
<td>right and left lobes</td>
<td>16 cm diameter (left), 3 cm diameter (right)</td>
<td>abdominal pain, nausea and vomiting, abdominal distention, weight loss</td>
<td>CT: solid mass, extensive hemorrhage in recurrent tumor</td>
<td>myxoid</td>
<td>postoperative bleeding and death</td>
</tr>
<tr>
<td>Kuo/2006 [5]</td>
<td>61/F</td>
<td>right lobe</td>
<td>11 x 11 x 13</td>
<td>fever, nausea, vomiting, jaundice, body-weight loss</td>
<td>CT: cystic lesion and bilateral intra-hepatic ducts were compressed</td>
<td>myxoid</td>
<td>two recurrences and cervical metastases; survival 27 months</td>
</tr>
<tr>
<td>Kim/2007 [6]</td>
<td>63/F</td>
<td>left lobe</td>
<td>7 x 6 x 4.3</td>
<td>asymptomatic, abnormal liver function test</td>
<td>CT: lobulated mass; fatty; small area of nodular enhancement</td>
<td>well differentiated</td>
<td>tumor-free for at least 8 months</td>
</tr>
<tr>
<td>Fang/current</td>
<td>63/M</td>
<td>left lobe</td>
<td>8 x 8.5 x 9</td>
<td>asymptomatic, incidental finding</td>
<td>CT: well-defined encapsulated, fatty tumor; mild delayed enhancement in soft-tissue component within the lesion</td>
<td>myxoid</td>
<td>tumor-free for at least 5 years</td>
</tr>
</tbody>
</table>

<sup>a</sup>NA: not available  
<sup>b</sup>RUQ: right upper quadrant of the abdomen  
<sup>c</sup>CT: computed tomography
from the extremities or retroperitoneum [1-3]. The first published case of primary hepatic liposarcoma we found in the English literature was reported by Wolloch et al. in a 22-year-old man in 1973 [4]. According to the literature, primary hepatic liposarcoma occurs most often in adults, in the fifth and sixth decades of life (Table 1) [1, 5, 6]. It has also been described in children, who had a liposarcoma in the hepatic hilum, presenting as obstructive jaundice and abdominal pain [1, 7, 8].

The clinical presentation of primary hepatic liposarcoma varies, and patients may be free of symptoms. Right-sided abdominal pain is the most common symptom. Other symptoms include fever, nausea and vomiting, jaundice, and body weight loss [7, 8]. In the current study, the patient had no clinical abdominal symptoms. Early diagnosis is difficult without an imaging study because the liver is a silent organ in the abdomen; thus, a tumor may not induce symptoms until it becomes large. Furthermore, there are few tumor-specific characteristics by which liposarcoma can be recognized. In previous cases, patients have had almost normal liver function tests and tumor markers were within physiologically normal ranges.

Fat tissue appears with unique characteristics on every imaging modality, and these are used in the diagnosis and
differentiation of tumors. Ultrasound is the most convenient tool for screening the solid organs in the abdomen. The fat component generally appears hyperechogenicity on a hepatic screen. On CT, fat component shows low attenuation, in a range of –10 to –100 HU [3]. Tumors with large amounts of fat, such as lipomas or liposarcomas, usually demonstrate typical negative HU characteristics. In our patient, the fat component within the lesion showed negative HU values, from –20 to –70. On MRI, fat displays a hyperintense signal on T1-weighted images [2]. On in-phase images, the signal from fat and water are additive, while on out-of-phase images the fat signal is subtracted from the water signal. Lesions containing fat and water therefore show a loss of signal intensity on out-of-phase images when compared with in-phase images.

Fat-containing tumors of the liver are not common. They can contain macroscopic fat or intracellular lipid [2, 3]. Primary liposarcoma belongs to the “macroscopic fat” category, although it also contains a soft-tissue component. Other lesions containing macroscopic fat include angiomyolipoma, lipoma, hepatocellular carcinoma with fatty change…etc [3, 10]. Correct detection and differentiation of macroscopic fat-containing tumors is possible with CT. Hepatic lipoma, angiomyolipoma, and hepatocellular carcinoma should be included in the differential diagnosis of liposarcoma.

In our patient, the mass shows fat and soft tissue components. The finding of a hepatic mass with two components narrows the differential diagnosis to liposarcoma, angiomyolipoma and hepatocellular carcinoma. Additionally, the mass shows mild enhancement of the soft tissue component in the delayed phase image. It strongly suggests the diagnosis of hepatic liposarcoma. The image appearance is unlike hepatic angiomylipoma and hepatocellular carcinoma, showing strong enhancement in the arterial phase, then becoming isodense or hypodense in the portal phase or delayed phase [3, 6].

Five major histological categories of liposarcoma have been reported: (1) myxoid, (2) round cell, (3) well differentiated, (4) dedifferentiated, and (5) pleomorphic [11]. Myxoid, well-differentiated, and dedifferentiated liposarcomas have been recorded in the English literature [1, 4-6]. Myxoid liposarcoma is more common than the other two types. Curative surgery is still the most effective way to manage the disease [5]. In our case, presence of the adipose tissue in histology is compatible with low attenuated area in tumor on CT image. The mild enhanced soft tissue component after contrast administration could be correlated with the picture of lipoblasts and capillary network in myxoid matrix. The prognosis of hepatic liposarcoma varies with the histological type. The well-differentiated type is considered to be a low-grade malignancy. The myxoid type has an intermediate prognosis. Some patients are free of disease for months and years, but a few patients die of the complications caused by recurrent tumor [5-6, 11]. A sonographic examination is recommended to detect recurrence.

In conclusion, primary liposarcoma of the liver is extremely rare. It usually has a heterogeneous hypodense appearance on CT, and can be preoperatively differentiated from other fat-containing tumors with dynamic CT.
Dynamic CT in diagnosing hepatic liposarcoma

REFERENCE