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Abstract

A 76 year-old man, who underwent central bisegmentectomy of the liver, transcatheter arterial chemoembolization, and radiofrequency ablation for chronic hepatitis C virus-related hepatocellular carcinoma (HCC), was found to have a 3 cm mass in the spleen and a 2 cm mass in the liver by computed tomography in January 2003. As both tumors were adjacent, a diagnosis of HCC with splenic infiltration was made. In February 2003, transcatheter arterial chemoembolization and splenic arterial chemo-infusion were performed. However, the splenic tumor increased to 5 cm with slight enhancement on contrast-enhanced computed tomography performed 6 months later, while the hepatic tumor had no enhancement. Limited resection of the liver with splenectomy was performed in October 2003. Macroscopically, the splenic tumor showed infiltrative growth without a capsule while the hepatic tumor showed complete necrosis within its capsule. The splenic tumor was limited to the splenic parenchyma. Histologic examination revealed that the splenic tumor was poorly differentiated HCC, leading to the diagnosis of splenic metastasis. The patient is doing well 17 months after surgery without recurrence. One should perform surgery for splenic metastasis of HCC without hesitation whenever possible.

Key Words: Transcatheter arterial chemoembolization; Recurrence of hepatocellular carcinoma; Implantation

Introduction

Splenic metastasis of hepatocellular carcinoma (HCC) is rare[1-3)], and its clinical characteristics are not known. We report a resected case of splenic metastasis after repeated treatments for HCC.

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Case Report

A 76-year-old Japanese man received several regional treatments for hepatitis C virus-related HCC for 6 years. In March 1997, central liver bisegmentectomy was performed. For 2 episodes of intrahepatic recurrence, transcatheter arterial chemoembolization (TACE) and percutaneous radiofrequency ablation (RFA) were performed. In February 2003, contrast-enhanced computed tomography (CT) demonstrated recurrence of HCC in the lateral segment which was seen to invade into the spleen because both tumor was adjacent. Celiac angiography showed that this tumor was fed from a branch of the left hepatic artery and splenic artery. In March 2003, selective TACE from the left hepatic artery and arterial infusion of adriamycin and mitomycin with iodized oil in the splenic artery were performed. In August 2003, enhanced CT demonstrated that the splenic tumor had increased to 5 cm in diameter with light enhancement

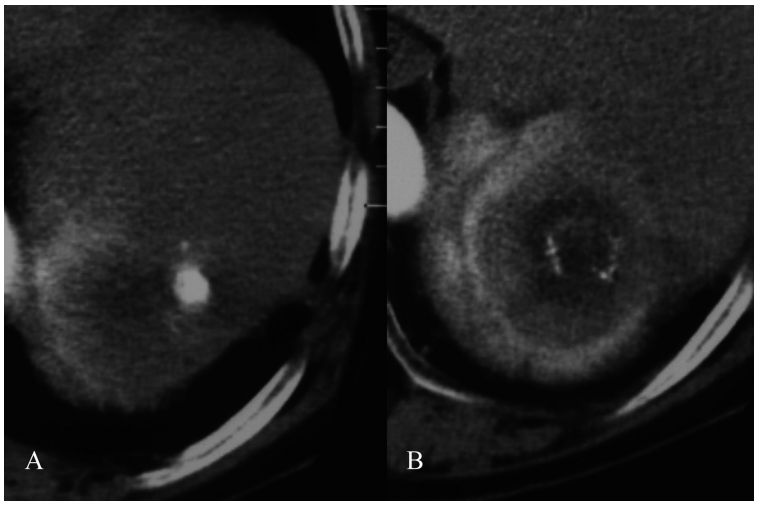

Figure 1. A, Contrast-enhanced computed tomography performed 5 months after TACE and splenic chemo-infusion. Hepatic tumor has completely accumulated iodized oil without enhancement. B, Splenic tumor has grown to 5 cm in diameter, with slight enhancement and partial accumulation of iodized oil. Slice B is 2 cm caudal side of slice A.

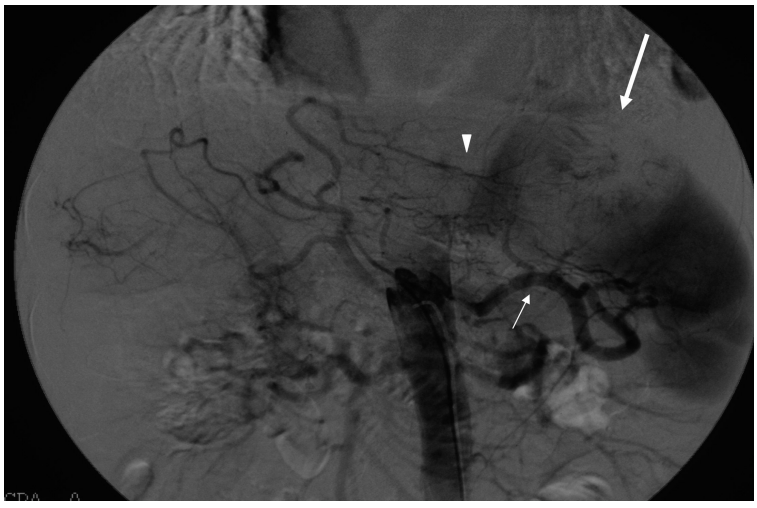

Figure 2. Celiac angiography reveals that the splenic tumor is fed from the left hepatic artery (arrow head) and splenic artery (small arrow). The splenic tumor was indicated by a large arrow.

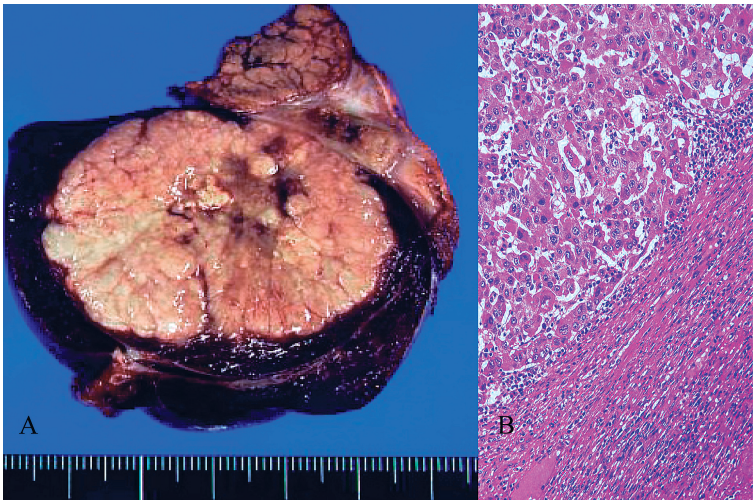

Figure 3. Macroscopic appearance and histologic examination of the resected specimen. A, Splenic tumor, 5 cm in diameter, has infiltrative growth. Hepatic tumor has complete necrosis within the capsule. Splenic tumor is limited to the splenic parenchyma. B, Histologic examination reveals that the splenic tumor is poorly differentiated hepatocellular carcinoma.

and with partial accumulation of residual iodized oil (Fig. 1).

The spleen was palpable without tenderness. Laboratory tests showed decreased platelets ($8.9\times10^4/\mu L$). Serum alpha-fetoprotein was 102 ng/mL. Celiac angiography again revealed feeding from both the left hepatic and splenic artery (Fig. 2). Since interventional therapy was ineffective, we decided to perform surgery.

In October 2003, we performed splenectomy with partial resection of both liver and left diaphgram. There was a hard dense adhesion between lateral segment of the liver and left diaphgram probably because of inflammation after the previous TACE. Macroscopically, the splenic tumor was 5 cm in diameter with infiltrative growth (Fig. 3A). The hepatic tumor was 1 cm in diameter and showed necrosis within a capsule. Hepatic parenchyma surrounding the tumor showed fibrous change. The border between the hepatic and splenic tumors was clear. Histologic examination showed that the splenic tumor was poorly differentiated HCC (Fig. 3B). The postoperative course was smooth, and the patient is doing well 17 months after surgery without recurrence or AFP increase (15 ng/mL).

Discussion

The incidence of splenic metastasis from HCC was reported as 2.1% in autopsied cases[1,2]. In our previous report of 352 recurrent HCC patients[3], there were no patients with splenic metastasis. In this case, both hepatic and splenic tumors were shown to be adjacent, and the hepatic tumor invaded into the spleen. Thus we diagnosed the splenic tumor as infiltration of HCC to the spleen. However, the splenic tumor was limited macroscopically to the splenic parenchyma, and histologic examination confirmed that the splenic tumor was separate from the liver, rather than infiltrating from liver to spleen. Another mechanism of the splenic tumor could be implantation by radiofrequency ablation therapy. Needle tract implantation of HCC after percutaneous treatment has been reported[4-7]. However, implantation generally occurred between the skin and peritoneum, if cancer was implanted into the spleen by the needle,

hyperthermia should induce necrosis in the cancer cells.

Most splenic metastases are reported to be hematogenous[8]. On the other hand, the presence of lymphatic flow with the inferior phrenic artery in HCC was reported[9]. In our case, enlarged lymph nodes were absent, and angiography from the left inferior phrenic artery did not flow to the splenic tumor, splenic metastasis was likely hematogenous.

Splenic metastasis from HCC can rupture and lead to fatal intraabdominal hemorrhage[10-12]. Interventional radiologic therapy has limitations as shown in this case. We suggest surgery for splenic lesions without hesitation, because of the risk of rupture, insufficient effects of interventional therapy, and a safe invasive procedure.

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