A 64-year-old diabetic male patient with a large hepatocellular carcinoma in the right lobe of the liver with immediate contiguity with liver surface and partial thrombosis of the right portal vein, developed fatal liver abscess shortly following transcatheter arterial chemoembolization with a reduced dose of chemoembolization mixture and no Gelfoam particles. We concluded that TACE in such circumstances may carry significant risk, even though the modified technique is employed.

**Key words:** Hepatocellular carcinoma, Transcatheter arterial chemoembolization, Complication

Hepatocellular carcinoma (HCC) is one of the commonest malignancies in Asian countries and the incidence is increasing in the Western world [1-4]. Radical surgery is generally accepted as the first choice of treatment. For unresectable HCC, transcatheter arterial chemoembolization (TACE) is being used with increasing frequency. The reported three-year survival rate for HCC patients treated with TACE ranged from 13% to 27%, while their untreated counterpart is less than 5% [5]. Several complications have been reported, but fatal complication is uncommon [2,3,6,7]. Herein, we describe a fulminant and fatal complication of TACE.

**CASE REPORT**

A 64-year-old man suffered from dull pain in the right upper quadrant for ten days. He had had a past history of diabetes mellitus under the control of oral hypoglycemia agent for 10 years. Physical examination revealed enlargement of the liver with its inferior margin three-finger-width below the right costal margin. Laboratory examinations showed a serum glutamic oxaloacetic transaminase value of 78 U/L, glutamic pyruvic transaminase value of 35 U/L, albumin of 3.9 g/dl, white blood cell count of $6.1 \times 10^3$/ml, platelet of $209 \times 10^3$/ml, glucose 236 mg/dl, serum alkaline phosphatase level of 140 U/L, total bilirubin level 1.6 mg/dl, and aspartate aminotransferase 78 U/L. Alpha-fetoprotein level was markedly elevated (8064 ng/ml). Liver ultrasound (US) examination revealed an ill-defined hyperechoic mass (8×9×10 cm) in the right lobe of the liver. An US-guided histologic
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biopsy was consistent with a diagnosis of HCC. Triphasic spiral computed tomography (CT) showed the tumor had immediate contact with the liver capsule. A linear filling defect was noted in the right portal vein, suggesting partial thrombosis of the right portal vein (Fig. 1). The diagnostic angiography revealed that the tumor was supplied by the replaced right hepatic artery originating from the superior mesenteric artery (Fig.2). The main portal vein was patent, but partial occlusion of the right portal vein was noted.

Via selective catheterization of the replaced right hepatic artery, we performed the modified TACE technique by injecting an emulsion of 8 ml lipiodol and 30 mg of doxorubicin (Adriamycin, Kodama, Tokyo, Japan), essentially only half of the usual dose of the embolization mixture, without subsequent embolization of Gelfoam particles. However, eight hours after TACE, abdominal pain and fever developed. Twenty hours after TACE, dyspnea supervened and abdominal pain became aggravated. Follow-up abdominal CT showed large amounts of intraperitoneal free air and a “bubbly” necrotic mass in the right lobe liver (Fig. 3). Under echoguide, we inserted a pigtail catheter into the bubbly mass. Foul-odor bloody pus mixed with debris was drained out and a pus culture yielded Clostridium perfringens. On the third day after TACE, the patient developed septic shock and died.

**DISCUSSION**

TACE is frequently employed to treat unresectable HCC [1,4,5]. The procedure involves selective embolization of the hepatic artery branches feeding the tumor with a mixture of lipiodol and a cytotoxic agent. Subsequent embolization of the feeding arteries with Gelfoam particles is believed to enhance the ischemic and chemotherapeutic effects because it hinders the systemic leakage of the injected mixture, but it is also recognized to increase the complication rate [5].

The most frequent complications associated with TACE are severe postembolization syndrome and deterioration of liver function. Liver abscess and tumor rupture are uncommon complications associated with TACE [2]. In presence of portal vein obstruction, TACE may cause massive necrosis of HCC and normal liver parenchyma, which may provide a bed for secondary infection [2,6]. Gelfoam particles may also contribute to infarction and subsequent abscess formation [6]. Occlusion of the portal vein, however, does not prevent a worthwhile response to chemoembolization [6]. For patients with portal vein occlusion, TACE has been reported as being a safe procedure if a modified technique consisting of superselective injection of reduced amounts (30% - 50% of the usual dose) of chemoembolization material with little or no Gelfoam particles is cautiously performed [6,8].

The mechanism of rupture of HCC after TACE
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still remains unclear. It may be related to increased pressure inside the friable necrotic tumor or necrosis of the liver capsule adjacent to large liver tumors following TACE [3,6,7]. Chung et al [2] reported three cases of non-fatal HCC rupture, which occurred in massive tumors with obstruction of the corresponding portal venous trunk and TACE was performed with at least 15 ml of lipiodol and Gelfoam particles. Piji et al [7] reported another fatal case of tumor rupture of a large, peripheral HCC following TACE with 15 ml lipiodol, 50 mg doxorubicin and Gelfoam particles. They suggest that one should consider withholding additional Gelfoam embolization, whenever a large HCC is not encapsulated by the rim of normal liver parenchyma.

In the present case, the fatal liver abscess and tumor rupture happened rapidly following the modified TACE utilizing a reduced dose of chemoembolization mixture without Gelfoam particles. We suggest that the modified TACE technique may not be safe enough for a large HCC with partial thrombosis of the portal vein and immediate contiguity to the liver surface, particularly in patients with diabetes mellitus. Further superselective embolization of the tumor feeding artery and prophylactic antibiotics coverage are recommended.

REFERENCES

肝細胞癌經化學栓塞術治療後併發致命性肝膿瘍及腫瘤破裂：病例報告

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我們報告一64歲糖尿病男性病人罹患巨大肝細胞癌，位於肝右葉邊緣且併有局部靜脈阻塞，經只以半量之化學栓塞劑的修正化學栓塞術治療後不久便發生致命性肝膿瘍，我們認為即使以修正技巧做化學栓塞術在此情況仍具危險性。

關鍵詞：肝細胞癌；化學栓塞術；併發症