Solitary Hepatocellular Carcinoma Fed by the Cystic Artery: Limitation of Transcatheter Arterial Embolization

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Abstract

Purpose: To clarify the limitations of transcatheter treatment for hepatocellular carcinoma (HCC) with parasitic feeders from the cystic artery.

Methods: Three male patients had a solitary HCC (average diameter 3 cm) fed by the cystic artery among 221 patients with HCC from 1994 to 1997. One tumor was nourished entirely from the cystic artery arising from the medial branch of the left hepatic artery, and two tumors were fed partially by the cystic arteries arising from the anterior inferior branch of the right hepatic artery. We analyzed the indications for transcatheter treatment for these three patients.

Results: We chose not to embolize the cystic artery for fear of necrosis of the gallbladder. Although embolization of the anterior branch of the right hepatic artery was performed in one patient with a tumor fed partially by the cystic artery, only half the tumor was embolized. Two patients underwent hepatic resection, and one received percutaneous ethanol injection therapy. At follow-up of 28-40 months (average 33 months) all patients are alive.

Conclusion: Feeding by the cystic artery represents a limitation of TAE for HCC.

Key words: Cystic artery—Hepatocellular carcinoma—Transcatheter embolization

Hepatocellular carcinoma (HCC) is one of the most frequent hepatic malignancies occurring in the East Asian region, and often arises from chronic viral hepatitis and subsequent liver cirrhosis. Recent advances in the treatment of HCC have made several therapeutic procedures possible, such as hepatic resection [1], transcatheter arterial embolization (TAE) [2] and chemoembolization (TACE) [3], repeated arterial infusion chemotherapy using implantable ports, percutaneous ethanol injection therapy (PEIT) [4], and microwave coagulation therapy [5]. As ischemic damage to tumors by means of TAE or TACE depends on a predominantly arterial supply to the tumor, neither of these procedures is very effective for an avascular or very hypovascular tumor nourished mainly by portal blood. Hypovascularity of a tumor thus constitutes a limitation of the therapeutic effect by TAE or TACE.

Recently we encountered three patients with solitary HCC fed either entirely (1 patient) or partially (2 patients) by the cystic artery. As a result we were not able to embolize the feeding artery for fear of necrosis of the gallbladder [6-8]. Parasitic feeding of the tumor by the cystic artery should therefore be considered another limitation of TAE.

Patients and Methods

The three patients with HCC we report here were among 221 patients diagnosed with HCC in our department between April 1994 and December 1997. The treatment chosen for each of the three patients is analyzed.

Patient 1 was a 67-year-old man who had liver cirrhosis resulting from HC viral hepatitis and was admitted for further examination of a tumor, 3 cm in diameter, located in the medial segment of the left lobe of the liver. The serum alphafetoprotein (AFP) level was 18 ng/ml. Ultrasonography (US) showed a hypoechoic round lesion, and computed tomography (CT) revealed an irregular low-density area on precontrast scanning (Fig. 1A) and a well-enhanced lesion on the arterial phase of helical dynamic scanning. Common hepatic angiography revealed fine irregular tumor vessels fed by the cystic artery arising from the medial branch of the left hepatic artery. Superselective cystic arteriography further revealed the tumor to be entirely nourished by the cystic artery (Fig. 1B). Because the patient had poor hepatic functional reserve, PEIT was selected for treatment.

Patient 2 was a 35-year-old man with HB chronic hepatitis who was admitted for further examination of a tumor, 3 cm in diameter,
Fig. 1. A 67-year-old man. A Unenhanced CT scan shows a hypodense tumor (arrow) in the medial segment of the left lobe of the liver. B Superselective cystic arteriography reveals fine tumor vessels (arrow) fed by the cystic artery.

Fig. 2. A 35-year-old man. A Unenhanced CT scan shows an isodense tumor (arrows) to the liver parenchyma in the right anterior segment. B Common hepatic arteriography reveals fine tumor vessels as well as a dense tumor stain (arrow). C Arteriography of the anterior branch of the right hepatic artery shows the upper half of the tumor to be nourished by the anterior inferior branch. D Superselective cystic arteriography demonstrates the lower half of the tumor to be nourished by the cystic artery.