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Case Report

Chemoembolization for hepatocellular carcinoma supplied by the right gastric artery

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ABSTRACT

There are various types of extrahepatic collateral vessels, but a right gastric artery that supplies hepatocellular carcinoma (HCC) is rare. Knowledge of this rare parasitic vessel will enhance the therapeutic efficacy of transcatheter arterial chemoembolization (TACE) for HCC. We present a case of TACE to treat a HCC that was fed by the right gastric artery. A 60-year-old man with recurrent HCC underwent four repeated sessions of TACE. The HCC was successfully treated by TACE via the right gastric artery.

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Keywords: Chemoembolization; Hepatocellular carcinoma; Parasitic supply

Introduction

Hepatocellular carcinoma (HCC) is one of the most common malignant tumors in East Asian countries. About 70% to 80% of cases are unresectable at the time of presentation.¹ Because HCCs are exclusively supplied by the hepatic artery,² transcatheter arterial chemoembolization (TACE) has an important role in the treatment of inoperable HCC.

Repeated TACE is frequently performed for tumor control. However, HCC frequently recurs after repeated TACE and the development of extrahepatic collateral arteries can impair the effectiveness of TACE.³ The incidence of collateral pathway development has been reported to be 20% to 23%.⁴

Various types of extrahepatic collateral vessels supply recurrent HCC, but to our knowledge, few reports have described recurrent HCC supplied by the right gastric artery. Therefore, we present a case of HCC that was supplied by the right gastric artery and treated with TACE.

Case Report

A 60-year-old man was admitted to our institution for re-

Fig. 1. An arterial phase abdominal computed tomography image obtained 3 months before transcatheter arterial chemoembolization shows a defect in lipiodol retention and enhancement of the defective portion, indicative of recurrent hepatocellular carcinoma (arrowheads).

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Fig. 2. (A) A celiac angiogram shows staining of a nodular tumor in the left lobe of the liver. Note that the segment III artery is obliterated due to previous transcatheter arterial chemoembolization (arrow). The right gastric artery was hypertrophied and suspected to be a feeder (arrowheads). (B) A selective right gastric angiogram reveals tumor staining of the recurrent portion. (C) A computed tomography image obtained 2 weeks later shows additional lipiodol uptake in the tumor.

peated TACE. He had been diagnosed with alcoholic liver cirrhosis. He underwent TACE four times for recurrent HCC in the left lobe of the liver. His hepatic function was class A according to the Child-Pugh score and his serum albumin was 3.3 g/dL. Abdominal computed tomography (CT) image revealed a recurrent HCC in the subcapsular area of segments II/III of the liver (Fig. 1). The HCC had been previously treated with TACE. Celiac angiography using a 5F catheter (Rosch hepatic; Cook, Bloomington, IN, USA) demonstrated a marginal tumor stain in the left lobe of the liver. However, on selective left hepatic angiography, the segment III artery was found to be obliterated as a result of previous TACE, and the right gastric artery appeared to be the feeder (Fig. 2A). Selective angiogram through the right gastric artery using a microcatheter (Progreat; Terumo, Tokyo, Japan) and a microwire (Asahi Meister; Asahi Intecc, Nagoya, Japan) revealed a marginal tumor stain (Fig. 2B). TACE was performed using an emulsion of 3.0 mL iodized oil (Lipiodol Ultra Fluid; Andre Guerbet, Aulnay-Sous-Bois, France) and 20 mg of infused doxorubicin hydrochloride (Adriamycin RDF; Ildong Pharmaceutical, Seoul, Korea). Additional embolization was performed with gelatin sponge particles (Cali-Gel; Alicon, Hangzhou, China). The CT images obtained 2 weeks later showed additional lipiodol uptake in the HCC in the left lobe of the liver (Fig. 2C). There were no complications such as gastritis or gastric ulcer.

Discussion

The treatment of choice in HCC should be a surgical removal. However there are many kinds of obstacle to perform operation. So, the TACE has become a widely used alternative treatment for management of unresectable HCCs.⁵ However, it is hard to expect that TACE would result in complete remission of the HCCs. Instead, the tumor control should be an aim of the TACE. In clinical practice, multiple sessions of TACE are frequently necessary. In such cases, the presence of extrahepatic collateral arteries is challenging to the interventional radiologist because it is a cause of local tumor recurrence or marginal recurrence. Various collateral blood supplies have been reported. Kim et al⁶ reported that the right inferior phrenic artery is the most commonly encountered collateral artery (32% of patients). The right gastric artery is rarely observed to act as an extrahepatic collateral artery (0.7% of patients). According to Miyayama et al⁷ the right gastric artery was found to supply HCC in only 3% of patients. And another study of Kim et al⁶ reported the 23 cases of parasitic right gastric arteries among the total 2,104 parasitic collateral artery (about 1%).

In our case, previous repeated TACEs had resulted in obliteration of the subcapsular area of the segment III hepatic artery.

Furthermore, a peripheral defect of iodized oil retention with some arterial enhancement within the tumor was noted on CT. The tumor observed on CT was not seen on celiac angiography. Those findings were thought to be responsible for development of an extrahepatic collateral artery. Knowledge of tumor location was helpful in identifying and differentiating the parasitic extrahepatic vessels because HCC in the lateral segment of the liver was suspected to be fed by the right gastric artery or left gastric artery in addition to the left inferior phrenic artery.⁷ Therefore, we considered that the right gastric artery might be the feeder, which was confirmed using super-selective right gastric angiography. If a gastric artery is suspected to be the feeder, normal gastric tissue should be differentiated from the tumor by staining. Therefore, delicate and selective catheterization must be performed. Gastric artery embolization might also result in several complications such as mucosal irritation, ulceration, or perforation. If a gastric ulcer develops after TACE through the gastric artery, medications such as H₂-blockers might be useful.⁸

In conclusion, HCC supplied by the right gastric artery is rarely encountered in TACE with an obliterated hepatic artery. Super-selective TACE via the right gastric artery can prevent gastric complications in such cases. In addition, careful review of CT images to determine tumor location and defects of iodized oil retention within a tumor after previous TACE is important for interventional radiologists.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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