J Korean Radiol Soc 2007;57:545 - 548

Intrabiliary Growth of Recurrent Tumor after Percutaneous RF ablation for Treating Liver Metastasis from Colon Cancer: A Case Report[1]

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A 64-year-old man who underwent right hemicolectomy 3.5 years ago for ascending colon cancer and then RF ablation for two metastatic nodules in the liver was admitted to our hospital with a new metastatic nodule in the S6/7 segment of the liver. The CT scan showed a low attenuating metastatic nodule 2.2 cm in diameter in the S6/7 segment of the liver, and the liver showed peripheral bile duct dilatation. This nodule was treated with percutaneous RF ablation. A follow-up CT seven months after RF ablation showed the presence of a viable tumor in the RF ablation zone, with tumor extension along the dilated bile duct. These findings were confirmed on the resected specimen.

Index words : Colonic neoplasms
Liver neoplasms
Tomography, X-Ray computed
Neoplasm recurrence, local
Neoplasm metastasis

The liver is a common site of metastases from colorectal adenocarcinoma. Various types of liver metastases may occur and they can demonstrate intrabiliary tumor growth (1 - 4). This tumor behavior is not easily detected, and it has rarely been detected using such imaging modalities as enhanced computed tomography (CT) or magnetic resonance imaging (MRI) (5, 6). We report here on a case of intrabiliary growth of a recurrent tumor after percutaneous radiofrequency (RF) ablation for treating a metastatic liver tumor from colon cancer.

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Received August 28, 2007 ; Accepted October 25, 2007
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Case Report

A 64-year-old man was admitted to our hospital with a new metastatic nodule in the S6/7 segment of the liver, and the nodule came from the patient's ascending colon cancer. The patient had previously undergone, 3.5 years earlier, right hemicolectomy combined with partial resection of the duodenal second portion for treating the patient's ascending colon cancer. Percutaneous RF ablations were performed 15 months after surgery for a metastatic liver tumor approximately 2 cm in diameter in the S3 segment of the liver and also 12 months after the initial RF ablation for a metastatic liver tumor 1.7 cm in diameter in the liver tip.

A contrast enhanced CT scan showed a low attenuating nodule 2.2 cm in diameter in the S6/7 segment of the liver. The bile duct abutting the nodule was dilated up

to 7 mm (Fig. 1A).

We decided to treat this metastatic nodule with percutaneous RF ablation. RF ablation was performed using a 200 W generator in the impedance control mode and an internally cooled electrode with a 3 cm active tip (Valleylab, Burlington, MA, U.S.A.). The RF ablation was performed percutaneously under real-time sonographic guidance with using a 3 - 5 MHz convex-array transducer (Prosound SSD-5500SV, Aloka, Tokyo, Japan). RF current was emitted for 12 minutes and then for another 6 minutes to overlap the same area of the previous RF ablation zone.

The one-month follow- up CT after RF ablation showed an RF ablation zone with a 3.4 cm diameter with peripheral bile duct dilatation (figures not shown) and no viable tumor was present. The three month CT (Fig. 1B) and five month CT (figures not shown) showed a possible viable tumor in the posterior aspect of the RF ablation zone with peripheral bile duct dilatation. The seven month follow-up CT after RF ablation showed the presence of a viable tumor in the RF ablation zone with tumor extension along the dilated bile duct (Fig. 1C).

We decided to perform right lobectomy to completely resect the viable tumor in the RF ablation zone in the right lobe of the liver. The patient then underwent a right lobectomy of the liver four weeks after right portal vein embolization.

A histological examination of the resected specimens revealed a metastatic adenocarcinoma from colon cancer, and there was extensive RF induced necrosis in the specimen. The tumor extended along the lumen of the bile ducts, replacing the non-neoplastic epithelium. The peripheral bile ducts were obstructed by the tumor cells and the cut surface of the bile duct was positive for cancer cells (Fig. 1D). There has been no recurrent tumor in the remnant left lobe of the liver during the subsequent

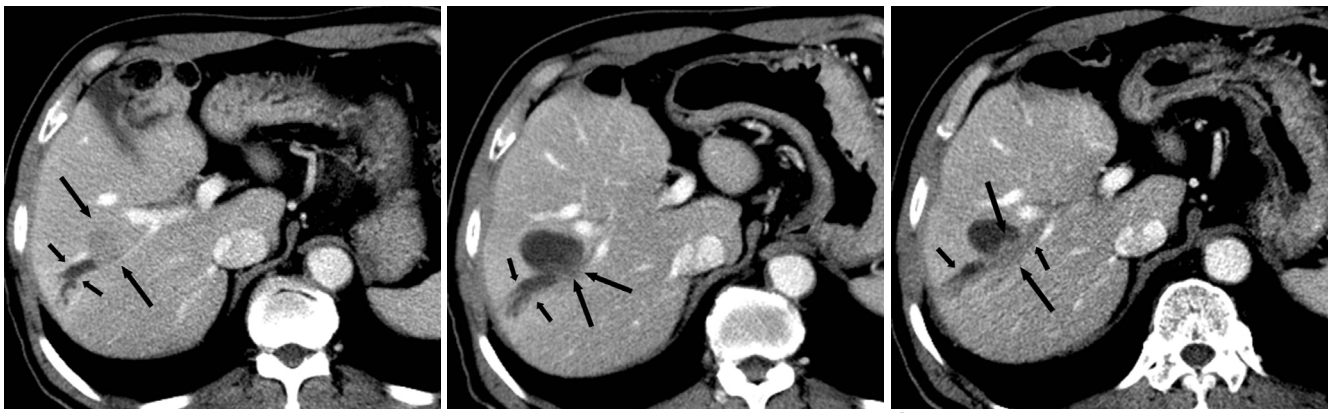

Fig. 1. A 64-year-old man with a metastatic nodule in the S6/7 segment of the liver from cancer of the ascending colon.
A. The transverse (**A**) image of the contrast enhanced liver CT before RF ablation shows an approximate 2.2 cm diameter low attenuating nodule (arrows) in the S6/7 segment of the liver. The bile duct (small arrows) abutting the nodule is dilated up to 7 mm.
B. A three month follow-up transverse image (**B**) of the contrast enhanced liver CT after RF ablation shows a possible viable tumor (arrows) in the posterior aspect of the RF ablation zone with peripheral bile duct dilatation (small arrows).
C. A seven month follow-up transverse image (**C**) of the contrast enhanced liver CT after RF ablation shows interval growth of the viable tumor (arrows) in the RF ablation zone with extension to the dilated bile duct (small arrows).
D. A resected specimen of the right lobe of the liver shows metastatic adenocarcinoma (arrows) from colon cancer, and the specimen also showed extensive RF induced necrosis (arrowheads). The tumor extended along the lumen of the bile ducts (small arrows), and the peripheral bile ducts were obstructed by the tumor.

ten months follow-up period.

Discussion

Macroscopic intrabiliary tumor growth has been reported as a mode of intrahepatic spread in patients suffering with colorectal liver metastasis. Metastatic colon cancer may exhibit the features of a benign or malignant primary biliary neoplasm. The growth of metastatic colon carcinoma may tend to spread along the epithelial lining, and this may mimic transitional cell carcinoma in the bladder and bronchioalveolar carcinoma in the lung (1, 2).

The use of contrast enhanced CT is helpful for making the diagnosis of intrabiliary tumor growth, with findings of low attenuating tumors in the liver parenchyma and dilated peripheral bile ducts (4). These features indicate tumor invasion of the bile duct and the possible existence of intrabiliary tumor growth. Okano et al. (6) described the CT findings of macroscopic intrabiliary tumor growth of colorectal liver metastases; they described 3 patterns as 1) a thickened portal tract, 2) intrahepatic bile duct dilatation and 3) a wedge-shaped area with enhancement. Our case also showed a low attenuating tumor in the liver parenchyma with a dilated peripheral bile duct, but a thickened portal tract or a wedge-shaped area with enhancement was not seen.

Colorectal liver metastases with macroscopic intrabiliary tumor growth are not rare and they have been reported to account for more than 10% of the surgically resected cases (4). Aggressive surgical treatment, including hepatectomy, can improve the chance of long-term survival for patients with macroscopic intrabiliary growth of a colorectal liver metastasis (7). Therefore, surgical treatment, including hepatectomy, may be a better option than performing percutaneous RF ablation for treating a metastatic liver tumor from colon cancer and the liver tumor shows intrabiliary tumor growth.

This study has some limitations. First, it is not clear if there was intrabiliary tumor growth before RF ablation or intrabiliary tumor growth of the recurrent tumor after RF ablation because a PTC (percutaneous transhepatic cholangiogram) or MRCP (Magnetic resonance cholangiopancreatography) was not performed before RF ablation to confirm the presence of intrabiliary tumor growth. Second, the early tumor recurrence was mainly due to the heat sink effect from the adjacent portal vein and hepatic artery. However, the possible growth of a tiny tumor focus that remained in the bile duct could not be excluded.

In summary, we describe here a case of intrabiliary tumor growth of a recurrent tumor after percutaneous radiofrequency (RF) ablation of a metastatic liver tumor from colon cancer.

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대한영상의학회지 2007;57:545 - 548

결장암 간 전이의 경피적 고주파열치료 후 재발암의 담관 내 종양 성장: 증례 보고[1]

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3년 반 전에 우측 결장제거술을 받았고, 2개의 간 전이로 고주파열치료를 받았던 64세 남자환자가 새 간 전이가 발견되어 입원하였다. CT 영상에서 6번/7번 간 분절에 늘어난 주변 담관을 동반한 2.2 cm의 저음영 전이 결절이 있어 경피적 고주파열치료로 치료하였다. 고주파열치료 후 7개월 추적 CT영상에서 고주파열치료 병변과 인접한 확장된 담관을 따라 암이 퍼져있었으며 이런 소견은 절제 표본에서 확인되었다.