Management of Postsurgical Recurrence of Hepatocellular Carcinoma with Rhenium 188–HDD Labeled Iodized Oil

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Surgical resection with partial hepatectomy is the treatment of choice in patients with hepatocellular carcinoma (HCC). However, after recurrence, which is common, such patients have limited therapeutic options. In the present report, transarterial radionuclide therapy (TART) with rhenium 188 HDD–labeled Lipiodol was used to treat a patient with postsurgical recurrence of HCC. The patient tolerated therapy well and the lesions were completely ablated with a single dose of ^{188}Re; the patient is free of disease for 14 months. TART with ^{188}Re-HDD Lipiodol appears to be a promising new therapy in case of HCC recurrence after partial hepatectomy and requires further investigation.

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Abbreviations: AFP = α-fetoprotein, HCC = hepatocellular carcinoma, TACE = transarterial chemoembolization, TART = transarterial radionuclide therapy

FOR patients with hepatocellular carcinoma (HCC) without cirrhosis, surgical resection with partial hepatectomy is the treatment of choice. Although resection of HCC is potentially curative, the recurrence rate is very high (50%–100% at 5 years) (1–5). Therapeutic options available in such cases include percutaneous ablative therapy (with ethanol, acetic acid, or hot saline solution injection; radiofrequency ablation; or cryoablation), transarterial chemoembolization (TACE), hormonal therapy, external radiation therapy, systemic chemotherapy, immunotherapy, and internal radiation therapy (1,6). Internal radiation therapy can be performed in the form of selective hepatic transarterial radionuclide therapy (TART).

Among various radionuclides that can be used for this purpose, rhenium Re 188 appears to be suitable because of its short half-life (16.9 hours), high-energy β-emission (2.1 MeV) and low-energy γ-emission (155 KeV), and availability through the tungsten W 188/^{188}Re generator system (7,8). However, experience with the use of this agent for TART is limited.

Herein we report our experience with the use of ^{188}Re-labeled Lipiodol (Savage Laboratories, Melville, NY) in the successful treatment of a patient with recurrent HCC after surgical treatment.

CASE REPORT

A 34-year-old man presented with a history of weight loss and anorexia. On examination, the liver was found to be enlarged, hard, and nodular. The spleen was not palpable. There was no evidence of pallor, cyanosis, icterus, or peripheral lymphadenopathy. His laboratory values were within normal limits except for liver function results (aspartate/alanine aminotransferase, γ-glutamyl transpeptidase, alkaline phosphatase), which were mildly increased. Triple-phase computed tomography (CT) revealed a 10-cm × 9.7-cm heterogenous enhancing lesion in segments VI/VII of the liver (**Figure**, **part a**), which was consistent with HCC on fine-needle aspiration cytologic examination. On further investigation, he was found to be positive for Australia antigen and his serum α-fetoprotein (AFP) level was 555 ng/mL (normal, <10 ng/mL). The patient underwent right hepatectomy. Histopathologic examination of the resected tumor confirmed HCC. Immunostaining was positive for AFP and showed randomly distributed intracytoplasmic Australia antigen. After surgery, his AFP level decreased to 4.1 ng/mL. However, 4 months after surgery, his AFP level increased to 56.0 ng/mL. Contrast material–enhanced magnetic resonance (MR) imaging of the liver showed two small discrete lesions in the left lobe (segment II; **Figure**, **part b**). In the given clinical context (ie, histopathologically proven case of HCC), new lesions in the liver (not present in the presurgical CT scans or ultrasonography) and a 14-fold increase in AFP level (in the absence of cirrhosis in this patient)

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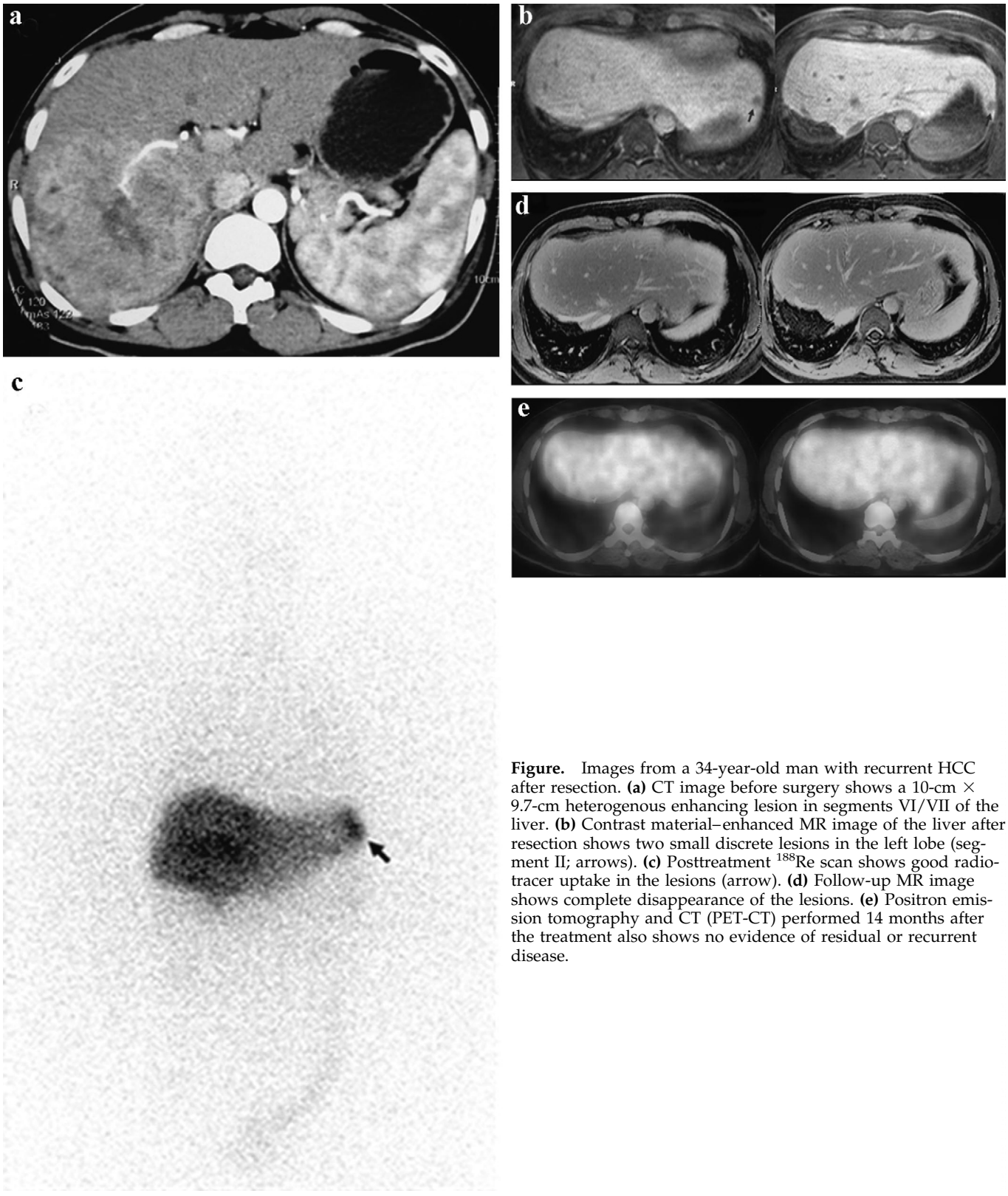

Figure. Images from a 34-year-old man with recurrent HCC after resection. **(a)** CT image before surgery shows a 10-cm × 9.7-cm heterogenous enhancing lesion in segments VI/VII of the liver. **(b)** Contrast material–enhanced MR image of the liver after resection shows two small discrete lesions in the left lobe (segment II; arrows). **(c)** Posttreatment ^{188}Re scan shows good radiotracer uptake in the lesions (arrow). **(d)** Follow-up MR image shows complete disappearance of the lesions. **(e)** Positron emission tomography and CT (PET-CT) performed 14 months after the treatment also shows no evidence of residual or recurrent disease.

were considered to indicate recurrence of HCC. Therefore, biopsy confirmation was not obtained. After discussion of therapeutic options, the patient consented to treatment with TART. In addition, this injection protocol was chosen with the aim of eliminating any occult microscopic lesions in the remainder of the liver.