Case Report

Hepatocellular Carcinoma Developing at the Puncture Site after Percutaneous Ethanol Injection

Jazon Almeida, MD, PhD, Maria Mesquita, MD, PhD, José Ferraz, MD, PhD, Ademar Yamanaka, MD, PhD, Cecília Escanhoela, MD, PhD, Ilka Fátima Boin, MD, PhD, Gustavo Pereira, MD, Tiago Pereira, MD, Elza Soares, MD, PhD

Department of Clinic/Gastroenterology and Gastrocentro/Faculty of Medical Sciences, University of Campinas, Campinas, SP, Brazil

Received 21 June 2006; accepted 13 August 2007

ABSTRACT: Percutaneous ethanol injection (PEI) is an option for hepatocellular carcinoma (HCC) treatment that is most effective for solitary lesions ≤5 cm or multiple lesions ≤3 cm. Malignant seeding along the needle tract is a rare complication of the procedure. We report a case of tumor seeding along the needle tract following PEI treatment for HCC arising 21 months after treatment. © 2007 Wiley Periodicals, Inc. *J Clin Ultrasound* **36**:105–107, 2008; Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/jcu.20428

Keywords: hepatocellular carcinoma; percutaneous ethanol injection; needle tract seeding

Recently, there has been a growing interest in screening and surveillance of liver cirrhosis patients for the early detection of hepatocellular carcinoma (HCC).[1] Treatment modalities for small HCC include surgical resection, percutaneous ethanol injection (PEI), ablation therapies, chemoembolization, and liver transplantation, their efficacy depending on tumor size, location, and number of lesions.[2] Therefore, early HCC detection and treatment may impact patient survival.

PEI is most effective with solitary lesions ≤5.0 cm or multiple lesions ≤3.0 cm.[2] However, the procedure is not devoid of complications; in particular, tumor seeding along the needle tract is a serious complication that can result in patient exclusion from a liver transplantation program.[3,4] The real incidence of needle tract seeding after PEI is difficult to ascertain, because the published data are mainly case reports and small series.[5]

We report a case of tumor seeding along the needle tract following PEI treatment for HCC arising 21 months after the procedure.

CASE REPORT

A 60-year-old Caucasian patient with Child-Turcotte-Pugh class B alcoholic liver cirrhosis associated with portal hypertension was diagnosed with a focal hepatic lesion during routine sonographic examination at the Liver Unit in our hospital. The examination was performed with a PowerVision 6000 scanner equipped with a 3.75-MHz curved-array transducer (Toshiba, Tokyo, Japan) and revealed a round, 4.3- × 4.2-cm heterogeneous lesion surrounded by a hypoechoic rim in segment 2 (Figure 1). The patient's α-fetoprotein (AFP) level was 2.4 ng/ml and des-gamma-carboxy prothrombin was 0.09 AU/ml. Because abdominal CT examination did not confirm the diagnosis of HCC, fine-needle aspiration biopsy was performed, which confirmed the diagnosis but could not determine the degree of tumor differentiation. Sonographically guided PEI was chosen as the therapeutic option because chemoembolization was not available, and tumor size and liver dysfunction precluded liver transplantation and/or surgical resection. The procedure was performed every other day. Using a 22-gauge Chiba needle, a total of 23.5 ml of ethanol was injected into the center of the lesion over 9 sessions. Twenty-one months after the procedure, a

Correspondence to: J. Almeida

FIGURE 1. Sonogram shows the hepatocellular carcinoma (arrow) in segment 2.

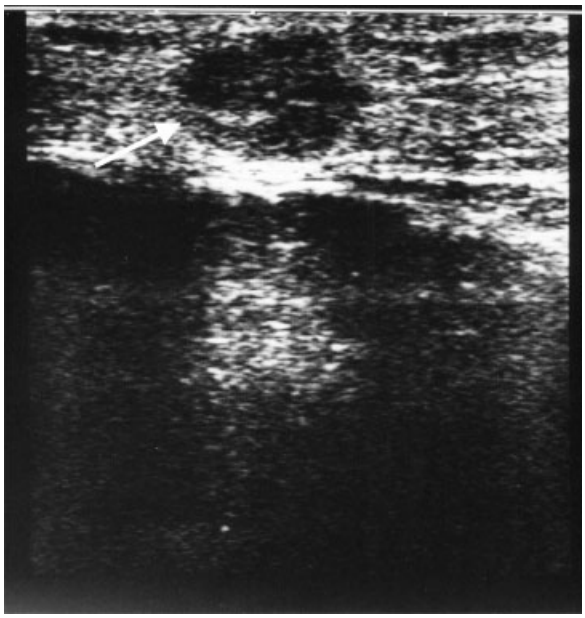

FIGURE 2. Sonogram of the palpable nodule at the puncture site of previous percutaneous ethanol injection shows a hypoechoic solid mass (arrow).

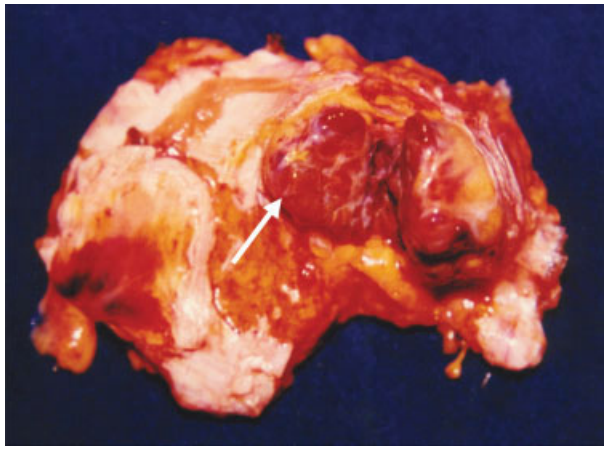

FIGURE 3. Photograph shows the resected specimen from the abdominal wall with the metastasis (arrow).

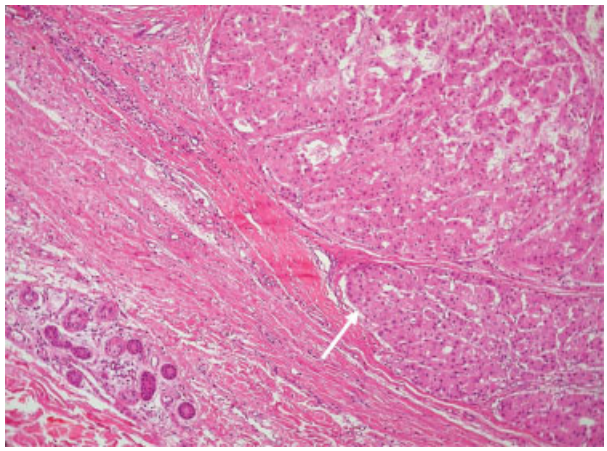

FIGURE 4. Photomicrograph of the resected specimen shows well-differentiated hepatocellular carcinoma surrounded by adipose tissue and a sweat gland.

subcutaneous nodule was noticed over the puncture site. Sonography revealed a rounded, 2.0- × 1.2-cm homogeneous hypoechoic mass (Figure 2), as well as several new lesions in both lobes of the liver. These findings were confirmed on CT examination. Color Doppler imaging of the subcutaneous lesion revealed central arterial flow. The lesion was surgically explored, and a brownish tumor adherent to the fascia was excised (Figure 3). Pathologic examination revealed a dermal and subcutaneous metastasis of a well-differentiated HCC (Figure 4). Fifteen months later, sonographic examination revealed the development of portal vein thrombosis and ascites, with AFP levels of 118 ng/ml. The patient was last seen 49 months following PEI. A multinodular HCC occupied over 50% of the liver, with a serum AFP level of 777 ng/ml.

DISCUSSION

At our institution, the diagnosis of HCC complicating liver cirrhosis is made on the basis of 2 concordant imaging modalities (sonography and CT) or only 1 imaging technique associated with an AFP level >400 ng/ml. When it is difficult to achieve a definite diagnosis using these criteria, a percutaneous needle biopsy of the suspected nodule is performed, as in the present case.

PEI has been found to be an acceptable option of treatment for patients who are not suited to surgical resection or liver transplantation.[6] PEI is a safe, inexpensive procedure, and it can be

performed repeatedly under local anesthesia until completion of treatment.[7] Complete necrosis can be accomplished in over 70–80% of tumors <3.0 cm.[2] The complications associated with the method are rare (<2.4%), with a 0.1% mortality rate.[4]

After PEI, seeding along the needle tract has been reported between 0.13% and 1.15%[5] of cases, with an estimated risk of 0.08% per session and 0.6% per patient.[2] Ebara et al[8] performed PEI in 270 patients with small HCC as the first-line treatment option over a 20-year period and reported seeding along the needle tract in 5 patients (1.9%) 8 to 24 months after the procedure.

We performed a total of 150 sessions of PEI in 47 patients with HCC and cirrhosis in our Liver Unit between 1994 and 2005. During this period, the only case of tumor seeding along the needle tract has been the case reported herein, yielding a rate of 0.66% per session and an incidence of 2.1%. We cannot exclude the possibility that subcutaneous seeding was related to the previous percutaneous biopsy performed in our patient. However, we believe that the implant was related to the PEI procedure, because the location was exactly at the site of needle insertion for PEI, and there were multiple needle passes during the procedure. The interval between PEI and the diagnosis of seeding along the needle tract in our patient was 21 months. Previous reports[5] have shown that this complication can occur up to 48 months after the procedure, indicating the need for long-term surveillance for needle tract implantation in these patients.

Ishii et al[3] reported that the risk of needle tract implantation in HCC patients treated by PEI increases when the tumor size is >2 cm, as in the present case. However, other investigators have reported implanted tumors associated with HCC ≤2 cm.[9]

Though very rare, tumor seeding along the needle tract following PEI of HCC may occur, and this possible complication should be kept in mind during the extended follow-up of these patients to detect it early and perform surgical resection of the lesion.

REFERENCES

1. Bolondi L. Screening for hepatocellular carcinoma in cirrhosis. J Hepatol 2003;39:1076.
2. Llovet JM, Mas X, Aponte JJ, et al. Cost effectiveness of adjuvant therapy for hepatocellular carcinoma during the waiting list for liver transplantation. Gut 2002;50:123.
3. Ishii H, Okada S, Okusaka T, et al. Needle tract implantation of hepatocellular carcinoma after percutaneous ethanol injection. Cancer 1998;82:1638.
4. Casella G, Cacopardo E, Rovere G, et al. Cutaneous seeding after ultrasound-guided percutaneous ethanol injection for treatment of hepatocellular carcinoma. J Clin Ultrasound 2001;29:354.
5. Stigliano R, Burroughs AK. Should we biopsy each liver mass suspicious for HCC before liver transplantation?—No, please don't. J Hepatol 2005;43: 563.
6. Vilana R, Bruix J, Bru C, et al. Tumor size determines the efficacy of percutaneous ethanol injection for the treatment of small hepatocellular carcinoma. HEPATOLOGY 1992;16:353.
7. Ebara M, Kita K, Sugiura N, et al. Therapeutic effect of percutaneous ethanol injection on small hepatocellular carcinoma: evaluation with CT. Radiology 1995;195:371.
8. Ebara M, Okabe S, Kita K, et al. Percutaneous ethanol injection for small hepatocellular carcinoma: therapeutic efficacy based on 20-year observation. J Hepatol 2005;43:458.
9. Kosugi C, Furuse J, Ishii H, et al. Needle tract implantation of hepatocellular carcinoma and pancreatic carcinoma after ultrasound-guided percutaneous puncture: clinical and pathologic characteristics and the treatment of needle tract implantation. World J Surgery 2004;28:29.