Attack of the Clone: HCC Tract Seeding Following RFA

Deepak N. Amarapurkar, Mrudul V. Dharod, Deepak Chhabra

Bombay Hospital and Medical Research Centre, 12, Marine Lines, Mumbai, India

A 42-year-old obese male, accidentally detected to be hepatitis B surface antigen (HBsAg) positive, presented to us in 2006. Patient was negative for antibodies to hepatitis C virus (anti-HCV) and hepatitis B envelope antigen (HBeAg) and had hepatitis B (HBV) DNA viral load of 525,073 IU/ml. He had mild thrombocytopenia, mildly elevated serum transaminases, and hypoalbuminemia. Ultrasonography revealed two hypoechoic lesions in the right lobe of liver. Serum alpha-fetoprotein (AFP) levels were 4.99 IU/ml whereas upper gastrointestinal endoscopy revealed small esophageal varices. Patient was considered to have 'e' negative chronic hepatitis B related chronic liver disease and was started on tablet Lamivudine 100 mg once a day. Computed tomography (CT) showed two lesions in the segment V and VI of liver, measuring 5 and 3 cm in the widest dimensions, enhancing on arterial phase and without any portal vein involvement, and were diagnosed as hepatocellular carcinoma (HCC). Patient underwent selective transarterial chemoembolization (TACE) of the liver nodules. Post-TACE sequential surveillance CT and magnetic resonance (MR) imaging revealed nonviable tumor, with persistently normal AFP levels and a stable liver biochemistry. An MR imaging in November 2010 showed a new 3.1 cm lesion posterior to and abutting the previously TACE'd lesion, with imaging characteristics of local recurrence, which was subjected to radiofrequency ablation (RFA). Subsequent MR scans revealed unchanged TACE'd or RFA'd lesion. A scan done in February 2012 showed two new discrete enhancing nodules, ranging from 5 to 8 mm, in the lateral paretis, located within the internal oblique and in the intermuscular plane, along the RFA tract, with persistent enhancement on the delayed venous phase. Patient noticed a palpable lump at the same site in a few months, and the lump appeared to be increasing gradually in size over a

period of months. By December 2013, the lesion reached a size of 10.8 × 8.0 × 7.6 demonstrating heterogeneous arteriportal phase enhancement with progressive wash-out on delayed venous phase, a delayed enhancing rim, and intralesional fat and hemorrhage (Figure A'), highly

Figure A MRI Abdomen showing a large lobulated lesion in right antero-lateral paretis, measuring 10.8 (AP) × 8.0 (W) in transverse dimensions and 7.6 cm in supero-inferior extent. The mass appears heterogeneous on the unenhanced T1-w in-phase images, with foci of high signal, signifying presence of intralesional fat and hemorrhage. The fat planes surrounding the lesion are intact, and the lesion produces an inward bulge in peritoneal reflection, without intraperitoneal extension.

Figure B Surgical specimen of the lesion, opened transversely, showing areas of intralesional fat and hemorrhage.

Keywords: hepatocellular carcinoma, radiofrequency ablation, transarterial chemoembolization, HBV

Received: 26.06.2015; **Accepted:** 6.07.2015; **Available online:** 29 July 2015

Address for correspondence: Mrudul V. Dharod, Department of Endoscopy, MRC Wing, Bombay Hospital, 12, New Marine Lines, Mumbai 400020, India. Tel.: +91 022 22067676x367; mobile: +91 09881149194.

E-mail: mrudul.dharod@gmail.com

Abbreviations: AFP: alpha-fetoprotein; CT: computed tomography; DNA: deoxyribonucleic acid; HBeAg: hepatitis B envelope antigen; HBsAg: hepatitis B surface antigen; HBV: hepatitis B virus; HCC: hepatocellular carcinoma; HCV: hepatitis C virus; RFA: radiofrequency ablation; TACE: transarterial chemoembolization

<http://dx.doi.org/10.1016/j.jceh.2015.07.204>

Figure C Histopathology of the lesion showing tumor cells in a pseudoacinar pattern, with evidence of septae and without any portal tract.

suggestive of recurrent HCC due to tract seeding along the site of previous RFA. Patient underwent wide local excision of the tumor (Figure B) in July 2014, which was found adherent to 10th and 11th ribs but without any intraperitoneal extension. The histology of the excised specimen showed moderately differentiated hepatocellular carcinoma (Figure C).

DISCUSSION

Tract seeding with viable tumor cells complicates roughly 0.2–2.8% of RFA procedures as reported in a large meta-analysis¹ and smaller studies² with an average time of development for neoplastic seeding of 16 months. Risk factors for tract seeding after liver RFA include subcapsular tumor location, primary HCC, poorly differentiated carcinoma, multiple needle insertions, elevated AFP levels, deep tumors, and needle size (doubling of needle caliber

corresponding to a 60-fold increase in dissemination along the entry tract). The hazard of needle tract seeding can be minimized by meticulous technique, minimization of needle probe repositioning, and ablation of the tract upon needle withdrawal.³ Maintenance of follow-up is important and as seeded tumors may grow slowly, a long period of follow-up is recommended. Surgical excision of the affected chest wall, as pursued in our case, is frequently employed to remove implanted satellite tumors.⁴ Other treatment strategies utilized in treatment of HCC, such as embolization with or without chemotherapeutic agents, can also be applied to the treatment of cancerous needle tract nodules.⁵

CONFLICTS OF INTEREST

The authors have none to declare.

AUTHORS' CONTRIBUTIONS

Dr. Deepak Amarapurkar: Primary consulting Hepatologist of the patient. All decisions regarding patients care were taken by him. Dr. Mrudul V Dharod: Senior resident in the department, wrote the present manuscript, and is in consulting along with the first author. Dr. Deepak Chhabra: Hepatobiliary surgeon who operated on the patient and provided the surgical photographs.

REFERENCES

1. Mulier S, Mulier P, Ni Y, et al. Complications of radiofrequency coagulation of liver tumours. *Br J Surg*. 2002;89(10):1206–1222.
2. Espinoza S, Briggs P, Duret JS, Lapeyre M, de Baére T. Radiofrequency ablation of needle tract seeding in hepatocellular carcinoma. *J Vasc Interv Radiol*. 2005;16(5):743–746.
3. Llovet JM, Vilana R, Brú C, et al. Increased risk of tumor seeding after percutaneous radiofrequency ablation for single hepatocellular carcinoma. *Hepatology*. 2001;33(5):1124–1129.
4. Kumar N, Gaba RC, Knuttinen MG, et al. Tract seeding following radiofrequency ablation for hepatocellular carcinoma: prevention, detection, and management. *Semin Interv Radiol*. 2011;28(2):187–192.
5. Yamanaka T, Shiraki K, Ito T, et al. Transcatheter arterial embolization and extrabeam radiation therapy for subcutaneous seeding of hepatocellular carcinoma by percutaneous ethanol injection. *Hepatogastroenterology*. 2002;49(48):1656–1658.