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Percutaneous treatment of extrahepatic recurrence of hepatocellular carcinoma

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KEYWORDS

Hepatocellular carcinoma;
Percutaneous treatment;
Radiofrequency ablation;
Microwave ablation;
Electroporation

Abstract

Purpose: The goal of this study was to retrospectively evaluate the results of imaging-guided percutaneous ablation in patients with controlled intrahepatic hepatocellular carcinoma (HCC) with limited extrahepatic disease.

Materials and methods: Eleven patients with limited extrahepatic disease and/or potential short-term clinical manifestations with controlled primary intrahepatic HCC were included into the study. There were nine men and two women, with a mean age of 67.4 years \pm 10.2 (SD) (range: 54–85 years). All patients had extrahepatic disease treated by either radiofrequency ablation or electroporation. Extrahepatic disease consisted of lymph node metastases (5 patients), tumor seeding along a needle tract (3 patients), adrenal gland metastasis, bone metastasis and pulmonary metastasis (one patient each).

Results: Response to treatment was complete in 7/11 patients (64%). The mean survival time after treatment was 18.8 \pm 12.7 (SD) months (median, 16 months; range: 4–42 months). No severe complications associated with percutaneous treatment were observed.

Conclusion: Our results suggest that imaging-guided percutaneous ablation techniques should be considered as a useful option for the treatment of extrahepatic disease in patients with HCC. Further studies are needed, however to fully determine the potential role of these techniques in this elective application.

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Hepatocellular carcinoma (HCC) is the third leading cause of death by cancer worldwide (800,000 deaths/year) [1,2]. Despite important progress in the treatment of intrahepatic lesions, the prognosis of HCC in patients with extrahepatic disease is still poor [3]. European and Asian guidelines both agree that sorafenib is the treatment strategy for patients with advanced HCC (stage C according to the Barcelona Clinic Liver Cancer [BCLC] staging system) [4–6]. Two large, randomized, controlled international studies have demonstrated the efficacy of sorafenib in the treatment of advanced HCC [4,5]. However, subgroup analysis showed that sorafenib was equivalent to placebo with respect to overall survival for patients with extrahepatic disease [7,8]. Moreover, because of sorafenib toxicity, the quality of life of patients who receive this drug might be so altered that treatment discontinuation must often be considered [6]. Several studies that have tested the efficacy of other chemotherapies did not show clear improvement of survival by comparison with those reported with supportive cares [7–10]. However, the therapeutic role of sorafenib in patients with controlled intrahepatic HCC and extrahepatic disease has not been confirmed yet. Thus, local treatments could be a valuable alternate therapeutic option for these patients.

Local treatment of extrahepatic metastasis has a demonstrated benefit in selected BCLC C patients with controlled intrahepatic HCC and limited extrahepatic lesions in terms of diameter (≤ 3 cm) and number (≤ 3 lesions) [11–13]. Percutaneous treatments such as radiofrequency ablation, microwaves (MW), and electroporation seem to be among the best local treatments. Indeed, they are minimally invasive and are associated with fewer complications than surgical resection [14]. Percutaneous ablation techniques have improved during the last few years, in particular MW, which have the advantage of being a simple and rapid ablation technique requiring a single session, while multipolar radiofrequency ablation allows reliable ablation in a wide range of situations. Electroporation, which is non-thermal technique, is now available to treat tumors in challenging locations [14–16]. In the same time, imaging guidance techniques have made considerable progress with the development of ultrasound fusion and more recently cone-beam computed tomography (CBCT). The combination of these advances makes amenable more patients with technically challenging situations to percutaneous approaches.

The goal of this study was to retrospectively evaluate the potential role and the results of imaging-guided percutaneous ablation treatments in patients with controlled intrahepatic HCC with limited extrahepatic disease.

Materials and methods

Patients and treatments

A total of 818 patients with HCC were treated in our center between March 2002 and April 2015 using percutaneous ablation technique. Of these, the indication of percutaneous treatment was an extrahepatic location in 11 BCLC C patients (Table 1). There were nine men (82%) and two women (18%) with a mean age at the time of

treatment of $67.4 \text{ years} \pm 10.2$ (SD) (range: 54–85 years). All patients had Child-Pugh A cirrhosis and were in good general condition with a performance status of 0. A mean number of 3.9 individual HCC lesions per patient (range: 1–12) had previously been treated when extrahepatic disease was detected. The decision to perform percutaneous ablation was based on the presence of isolated extrahepatic disease and/or if a complication was anticipated such as a short-term risk of debilitation or a life-threatening complication.

All therapeutic decisions were based on a multidisciplinary meeting including hepatologists, oncologists, hepatobiliary surgeons and interventional radiologists. During the period of inclusion period, various percutaneous techniques were used [17]. Between 2002 and 2004, monopolar radiofrequency ablation was the only available method for tumor ablation. Multipolar radiofrequency ablation started in 2004, and gradually became the reference percutaneous technique for HCC because of the better predictability of the safety margins [17]. MW was added to the available technical options of tumor destruction in 2010 and irreversible electroporation in 2012.

Curative percutaneous ablation was performed in 9 patients. Patient 1 had a retroperitoneal lymph node metastasis after liver transplantation that was treated using ultrasound-guided monopolar radiofrequency ablation. Patient 2 was treated in 2010 by ultrasound-guided MW for a lymph node metastasis (Fig. 1). Patient 3 had peritoneal tumor seeding, secondary to bipolar radiofrequency ablation of recurrent invasive HCC following a right hepatectomy. He was treated in 2011 by ultrasound-guided bipolar radiofrequency ablation. Five patients with single metastases were treated by electroporation with dual ultrasound and CBCT guidance after 2012: three for lymph node involvement (patients 4, 5 and 6), two for diaphragmatic deposits secondary to multiple percutaneous ablations due to intrahepatic recurrence of HCC (patients 7 and 10). Patient 11 had a single lung metastases treated by CBCT-guided radiofrequency ablation.

In other two patients, tumor ablation was indicated for palliation only because of clinical symptoms. Patient 8 with adrenal gland involvement extending into the inferior vena cava was treated by electroporation, then bipolar CBCT-guided radiofrequency ablation (Fig. 2). Patient 9 had vertebral involvement associated with epiduritis treated by CBCT-guided bipolar radiofrequency ablation.

Treatment evaluation

Early and late complications after each session of percutaneous treatment were reported. All patients underwent imaging follow-up using computed tomography (CT) or magnetic resonance imaging (MRI) one month after the procedures to evaluate whether ablation was partial or complete. Patients underwent follow-up imaging every three months thereafter. In case of partial treatment, or disease recurrence, the treatment strategy was further discussed and decided during a multidisciplinary meeting. For all patients, survival and tumor progression was evaluated until the final follow-up in April 2015.

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