EDUCATIONAL FORUM

The Use of Ultrasound-guided Radiofrequency Ablation Therapy for Small Hepatocellular Carcinomas

Chien-Wei Su*

Division of Gastroenterology, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan

Hepatocellular carcinoma (HCC) is the second leading cause of cancer death in Taiwan. The primary liver cancer sequence in Taiwan starts with chronic infection with hepatitis B virus or hepatitis C virus, which is followed by cirrhosis and eventually the development of HCC. This is known as the trilogy of liver disease. In recent years, more patients with HCC have been diagnosed early and received curative treatment because of the gradual implementation of regular liver ultrasound to screen and monitor populations at high risk for developing HCC (e.g., patients with chronic hepatitis B, chronic hepatitis C, and cirrhosis). Hence, the prognosis of patients with HCC has improved substantially.

The selection of treatment modality for HCC is primarily based on the practice guidelines proposed by the American Association for the Study of Liver Diseases (AASLD) and the European Association for the Study of the Liver (EASL). For early stage HCC with the Barcelona Clinic Liver Cancer (BCLC) staging classification stage 0, stage A, or for HCC meeting the Milan Criteria (i.e., a solitary tumor smaller than 5 cm or 2–3 nodules smaller than 3 cm), curative treatment options include liver transplantation, surgical resection, and local tumor ablation therapies. Local tumor ablation therapies include percutaneous ethanol injection therapy (PEIT), percutaneous acetic acid injection, percutaneous microwave coagulation, and radiofrequency ablation (RFA). The 5-year survival rate exceeds 60% in patients with early stage HCC [1,2].

Among the ultrasound-guided local tumor ablation therapies, RFA performs better in causing tumor necrosis, compared to conventional PEIT. For tumors larger than 2 cm, it is noteworthy that the efficacy of RFA is significantly better than the efficacy of PEIT with regard to fewer treatment sessions, a higher rate of complete tumor necrosis, less local recurrence, better overall survival rate, and better recurrence-free survival rate [3]. Therefore, RFA has become the most common first-line local tumor ablation therapy for patients with small HCC.

The prognosis of patients with HCC after RFA is affected by factors such as liver functional reserve (e.g., serum albumin level, prothrombin time, and platelet count), age, and tumor characteristics [e.g., tumor size, number, vascular invasion, and serum alpha-fetoprotein (AFP) level] [4,5]. A change in the serum AFP level after RFA provides a clinical reference to tumor regression and recurrence [6,7]. In addition, in HCC patients with chronic hepatitis B or hepatitis C, postoperative antiviral treatment can inhibit viral replication, alleviate liver inflammation, regress fibrosis, improve liver functional reserve, and increase patient’s survival [8]. Thus, it can be recommended as an adjuvant therapy after RFA.

It is clinically important to compare the efficacy of RFA with surgical resection in treating small HCC. In the past few years, these treatments have been extensively investigated. According to studies published by the Taipei Veterans General Hospital (Taipei, Taiwan) and Kaohsiung Chang Gung Memorial Hospital (Kaohsiung City), which used multivariate analysis and propensity score matching analysis, both treatment modalities provided comparable long-term survival rates for patients with HCC within the Milan Criteria; however, patients who received surgical resection...
had lower tumor recurrence rates [9,10]. The current practice guidelines by the AASLD, EASL, and the Asian Pacific Association for the Study of the Liver for the management of HCC consequently all indicate that RFA and surgical resection are the first-line treatments for early stage HCC patients with good liver functional reserve [1,2]. However, surgical resection with its lower recurrence rate generally provides slightly better outcomes, compared to RFA. By contrast, RFA provides an ideal alternative if the patient is older, has poor liver functional reserve or performance status, or is unwilling to undergo surgery.

References