

Radiofrequency ablation in hepatocellular carcinoma

→ Nahum Goldberg*

A new study supports the use of image-guided radiofrequency ablation as a first-line treatment for well-selected cirrhotic patients with early-stage hepatocellular carcinoma.

Over the past decade, there has been increased interest in image-guided radiofrequency ablation (RFA) of focal tumours using needle-like applicators, because of the minimal morbidity and mortality compared with conventional surgical resection [1]. Clinical interest has focused upon treating hepatocellular carcinoma (HCC), because most patients have underlying liver disease and/or coagulopathies, which substantially increase surgical morbidity, and most patients develop additional foci of disease [1–4].

The use of heat energy in the form of localised radiofrequency to coagulate and ablate tumour has begun replacing prior methods, such as ethanol injection. This is because of the reduced number of treatments required and at least equivalent efficacy of RFA compared with ethanol injection [2,3]. Although there are many optimistic preliminary reports with short-term follow-up, RFA has nevertheless been criticised by some as ‘untested’, owing to a paucity of long-term results, particularly the

absence of five-year survival data [1–3].

Lencioni et al. provide an initial report of promising longer follow-up data, as they demonstrate five-year survival similar to surgical series for similarly stratified patients (see opposite).

The authors performed a prospective, intention-to-treat clinical trial in patients with hepatic cirrhosis (Child-Turcotte-Pugh class A or B) and early-stage HCC in whom percutaneous image-guided RFA was the only first-line anticancer treatment.

In total, 206 nonsurgical patients with either a single HCC ≤ 5 cm in diameter or up to three HCCs ≤ 3 cm each were enrolled. RFA was performed in 187 patients (91%).

Safety of the procedure was demonstrated, as there were no periprocedural deaths and only 2% had major complications. Overall survival was 97% at one year, 67% at three years, and 41% at five years, by intention-to-treat analysis, with a 48% five-year survival rate for those undergoing RFA. Median survival was 57 months.

Overall, the one-year, three-year, and five-year recurrence rates were 14%, 49%, and 81% respectively for the emergence of new tumours, highlighting the noncurative nature of local resection, and 4%, 10%, and 10% for local tumour progression, confirming that RFA in skilled hands can be effective at eradicating focal, but not distant, disease. The authors further confirmed prior interventional oncology literature, noting that Child-Turcotte-Pugh class and tumour multiplicity were additional predictors of survival.

These results suggest there is probably enough evidence to justify using image-guided RFA as a first-line treatment for cirrhotic patients with early-stage HCC with limited, well-defined tumour burden. Indeed, this is the practice at our institution, where RFA is also used as an adjunct to liver transplantation.

Nevertheless, the need for further studies, including larger and longer series and ideally a randomised direct comparison between surgery and image-guided ablation (RFA and other), must be

The study

R. Lencioni et al. (2005) **Early-stage hepatocellular carcinoma in patients with cirrhosis: long-term results of percutaneous image-guided radiofrequency ablation.** *Radiology* 234:961–967

Background. Patients with cirrhosis are at high risk of developing hepatocellular carcinoma (HCC). Radiofrequency ablation (RFA) is a promising treatment for early-stage HCC, but there are few data on its long-term efficacy.

Objective. To assess long-term survival rates in patients with early-stage HCC and underlying cirrhosis treated with percutaneous image-guided RFA as a first-line therapy.

Design & intervention. This prospective, single-arm trial recruited consecutive patients with Child-Turcotte-Pugh class A or B cirrhosis and early-stage HCC between June 1996 and January 2003. Patients who were suitable for liver transplantation or tumour resection were excluded. Percutaneous sonography-guided RFA was performed using a 460 kHz generator of 50 W, 150 W or 200 W. Target intratumoural temperatures were 95°C for the 50 W generator, and 105°C for the 150 W and 200 W generators. Needle tracks were ablated after all procedures. Patients with CT evidence of incomplete tumour ablation 1 month after treatment received a further dose. Patients who failed to improve after two sessions or who developed metastases were offered segmental transcatheter arterial chemoembolisation. Patients were followed up and tumour recurrence was monitored by 3-monthly ultrasonography and 6-monthly spiral CT, for a mean follow-up period of 24 months (range 3–78 months).

Outcome measures. The primary outcome measure was overall survival.

Results. Of 206 patients (69% male; mean age 67 years) who entered the study, 187 (91%) underwent RFA. Of the

patients given RFA (70% male; mean age 67 years), 61 were treated using a 50 W generator and 126 were treated using a 150 W or a 200 W generator. After one or two sessions of RFA, complete tumour regression was observed in 169 of 187 patients (90%) and 222 of 240 tumours (92%) at 1 month. Respective survival rates in the intention-to-treat population and in the RFA-treated patients were 97% and 97% at 1 year, 67% and 71% at 3 years and 41% and 48% at 5 years, respectively. Survival did not differ significantly between the two groups ($P=0.5094$). Among patients treated with RFA, survival was significantly greater in those with Child-Turcotte-Pugh class A cirrhosis than in those with Child-Turcotte-Pugh class B cirrhosis ($P=0.0006$), and in those with one tumour compared with those with several tumours ($P=0.0133$). Local tumour progression occurred in 4% of RFA-treated tumours at 1 year, 10% at 3 years and 10% at 5 years; metastasis was seen in 14%, 49% and 81%, respectively. Serious adverse events (including one case of tumour dissemination via the needle track) occurred in three patients, and minor complications were reported in nine patients.

Conclusion. First-line anticancer treatment with percutaneous image-guided RFA is effective in patients with cirrhosis and early-stage HCC for whom surgical resection is not indicated.

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acknowledged, because the study was of short follow-up duration, with a mean of two years, with wide variation.

Furthermore, the best way to perform tumour ablation in terms of technique, device selection, and potential combination with other therapies, such as chemoembolisation and adjuvant treatments to improve local and distant disease control, requires further study. Each

of these variables can potentially influence the study outcome.

Better definition of indications and treatment guidelines is also needed, with caution being urged against overoptimistically translating these promising data for the treatment of more advanced HCC (i.e. larger tumours) or other types of tumour (e.g. intrahepatic colorectal metastases), which are more difficult to treat with ablative techniques [1,4].

Details of the references cited in this article can be accessed at www.cancerworld.org/cancerworld

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