Editorial Commentary

Stereotactic radiofrequency ablation for hepatocellular carcinoma

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Hepatocellular carcinoma (HCC) is the number 2 most common cause of death from cancer worldwide and overall a major global health problem. Moreover, albeit the incidence of HCC goes up gradually with advancing age, reaching a peak at 70 years, globally there is an increasing incidence of HCC worldwide (1).

The increased focus on the topic has brought agreed diagnostic criteria, allowing HCC detection in early phases, now on only radiological findings for the most part, making histological confirmation generally unnecessary, except for the less common cases without the classical radiological picture (2-4). Moreover, accurate screening of HCC makes an early HCC diagnosis possible in many cases (5), so allowing early treatment.

Many treatments can be provided for HCC, both curative ones and not (5,6). As a matter of fact, whilst the ideal treatment for HCC is liver transplantation (LT), curing both HCC and underlying cirrhosis, what can LT do is limited because of organ shortage (6). Moreover, many patients with HCC are treated with other curative therapies, both surgical and percutaneous, either as single or as a bridge to LT, with undeniable survival benefits (5).

Percutaneous local ablation is the standard of care for BCLC O-A HCC not suitable for surgery. In particular, radiofrequency ablation (RFA) is generally considered the first-line therapy for very early stage (BCLC-0). Moreover, for tumours ≤2 cm both RF and ethanol injection (EI) can achieve complete responses in more than 90%, making local ablation comparable with resection. Anyway, due to better results in terms of local tumor necrosis, RFA in nowadays preferred to EI, whose role is restricted to cases in which, for technical reason, RFA is not considered feasible due to the high probability of both treatment failure (that is, when HCC is very near to a main vein) or risks (for example, HCC near to gallbladder of bowel). Moreover, a promising alternative is microwave ablation, whose advantage over RFA is absence of thermal dispersion when the lesion treated is near to a main vein (4). Furthermore, interesting data were reported for external beam radiotherapy, whose role in early HCC treatment is still under investigation (7,8).

Recently, Bale *et al.* has performed a retrospective study (9) to assess the efficacy of 3D-navigated multi-probe RFA with intraprocedural image fusion for the treatment of HCC by histopathologic examination. Overall, 97 patients, who received transplantation after bridging therapy of 195 HCCs by stereotactic RFA (SRFA), were retrospectively included. Authors indicated from their discovery that even with tumor sizes larger than 3cm, and without combining with additional treatments, multi-probe SRFA with intraprocedural image fusion is an efficient minimal invasive therapy for HCC.

The study surely represents the mirror of an extremely skilled group in the field of both HCC management and interventional radiology (9). However, some main aspects need further comment. In fact, the study reports that higher was the rate of total necrosis after locoregional therapy, minor was the probability of HCC recurrence after LT. However, authors do not mention that the rate of HCC recurrence after LT could be affected, together with efficacy of local ablation, also by both differential status and other biological aspects of the tumor (6).

Moreover, a wide range of tumor size has been reported to be effectively treated by SRFA. However, further experience is awaited to provide appropriate information

on the opportunity of SRFA treatment of big tumors, in particular about the risks of both adverse events and liver decompensation after treatment.

Furthermore, it is interesting that, albeit only in a low rate (3%), some cases have received SRFA out of the common indications for curative treatment (that is, 1 BCL C and 2 BCLC D stage, respectively).

Finally, the results of the study would indicate that SRFA could have superior rate of response in respect to all the results published so far using conventional RFA. However, this could reflect either a better technique or operators and, being a single center retrospective study, further experiences are surely needed to provide confirmation.

HCC management should overall be observed, both for clinical and research purposes, from two different points of view. The former relates to technical success of a specific procedure, aiming at maximizing the rate of tumor mass necrosis, mainly to avoid recurrence. In this sense, successful experiences about technically advanced both per-cutaneous (as SRFA), endovascular, systemic, surgical or combined treatment are welcome and merit further investigation. However, the rate of complete necrosis of the single HCC treated remains a surrogate endpoint, especially in the era of widespread improvement of LT outcome, globally due to better management of post-LT complications.

In fact, the latter point of view regards both the outcome and quality of life of any single person with HCC, from the diagnosis trough any single treatment of HCC, including eventually LT, to death. In this sense, despite the likelihood of success of any local HCC treatment, at the present knowledge of the issue, no single both percutaneous, endovascular nor systemic treatment can provide sufficient protection about HCC recurrence, especially after LT, a condition invariably associated with poor prognosis.

In conclusion, a long way has to be done yet, and a new era is hopefully expected, to transform the technical successes of important and advanced treatments, like SRFA, into healing from HCC.

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