Editorial

Editorial on "Role of thermal ablation in the management of colorectal liver metastasis"

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The last 30 years have shown the increasing role of Ablation in the treatment of malignant liver tumors. By the introduction of percutaneous ethanol injection (PEI) as first ablation tool for percutaneous treatment of hepatocellular carcinoma (HCC) in cirrhosis that firstly showed very high efficacy (1), several ablation techniques (mainly thermal) have been introduced in clinical practice aimed at destroying primary and secondary hepatic tumors as alternative or substitute tools to surgery. Radiofrequency ablation (RFA) was the first thermal technique that showed a good efficacy to ablate liver metastases (2). Among the secondary liver tumors, colorectal liver metastases (CRLM) represent the unique indication for ablation (2). Unlike HCC in cirrhosis where the role of RFA is well defined as first line therapy for HCC nodules < or equal to 2 cm or as alternative to surgery in 1–3 HCC nodules with the maximum diameter <3 cm (3), in the case of CRLM it is not possible to reproduce the same paradigm. Liver resection remains the standard of care for CRLM and the indications to ablation remain confined to nonresectable patients (4). The review article by Takahashi and Berber recently published in *HBSN* wells illustrates the current role of ablation in treatment of CRLM (5).

In their article in *HepatoBiliary Surg Nutr* 2019, the two authors revised and discussed current literature reporting the role of the most used thermal ablation techniques in treatment of patients with CRLM (5). In their article, Takahashi and Berber clearly report when ablation is indicated; the different approaches to perform ablation (open, percutaneous or laparoscopic); the characteristics of main thermal techniques used in clinical practice, such as RFA and microwaves ablation (MWSA); the complications of each technique; and the outcome of RFA and MWSA reported in the literature (patient and tumor characteristics for clinical outcomes, local tumor control and obviously survival, that remains the primary oncologic end point) (5). Takahashi and Berber begin their review with the results of CLOOC phase II trial by Ruers *et al.* aiming to compare palliative chemotherapy to RFA alone ± resection of resectable lesions in treatment of unresectable CRLM patients with maximum 10 lesions (6).

This is the first randomized study demonstrating that aggressive local treatment using RFA can prolong overall survival (OS) in patients with unresectable colorectal liver metastases compared to chemotherapy (6).

The article by Takahashi and Berber has the merit to be very clear on the following points:

(I) Authors clearly state that current RFA technology is stagnant.
Vice versa, they emphasize the role of MWSA that represents the real new tool to be considered as the first line technique in treating CRLM with ablation. This new role is due to the intrinsic characteristics of recent approved high-powered MWS: most powerful effect in inducing larger volumes of necrosis and faster ablation time compared to RFA; absence of the so-called sink-heat effect; capability to induce spherical areas of

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necrosis and therefore more predictable volumes of necrosis; and, mainly with respect to RFA, the possibility to induce 0.5–1 cm of ablation margins from the tip of MWS antenna (5).

(II) Takahashi and Berber rightly state to channel all patients to a multidisciplinary tumors boards before choosing the tailored treatment (5).

(III) The authors of the review make it clear that the main indication for ablation remains CRLM patients unfit for resection with maximum 8 lesions lesser than 4 cm, taking care to have a liver involvement of less than 20% (5).

Moreover, the authors suggest that it is also true that ablative treatments can have an important role when patients have limited recurrent diseases after a previous ablation or liver resection, owing to less morbidity and favourable recovery (5,7).

Furthermore, ablative techniques and liver resection should not be mutually excluding. In fact, ablation techniques and resection can be utilized together in case of bilobar diseases with improved perioperative outcomes (7).

(IV) Authors correctly report the characteristics, the techniques performance and the results of the 3 standard approaches for ablation: open, percutaneous and laparoscopic. Obviously, as the authors are both surgeons, they prefer the laparoscopic approach instead of a percutaneous approach (5).

It must be said that the percutaneous approach under ultrasound (US) guidance under unconscious sedation is very simple in expert hands and by now widely diffused in the world. Compared to laparoscopic approach, using the percutaneous approach, all liver segments can be easily reached (8). The use of percutaneous contrast-enhanced US (CEUS) easily allows the detection of the hepatic disease, the vascularization of the lesions before ablation and the control of the ablated area at the end of ablative procedure (9,10). In case of incomplete ablation, a new intra-procedure CEUS allows the detection of the untreated area that can be easily re-treated in the same session so to achieve a complete ablation of the lesion and to assess the presence and the size of the ablation margin (10). More so, this should be also the normal protocol in case of open approach and laparoscopic approach. Compared to an open approach, the laparoscopic approach has the advantage to be mini-invasive. Very recently, an Italian large series on laparoscopic MWSA (though in treating of HCC in cirrhosis) confirmed the high efficacy and safety of laparoscopic US guided MWSA (11). Nevertheless, the advantage of open and laparoscopic approaches is based on the possibility to perform intra-operative US (IOUS) that is the best detection tool in HCC and CRLM patients (12,13). It is well known that the use of IOUS can change dramatically the detection of liver lesions allowing the recognition of further lesions not detected preoperatively (13). Obviously, such detection of further lesions modifies the treatment planning and resection can be extended if necessary (13).

To this end, it is possible to add also the CEUS-IOUS to IOUS to control the volume of the ablated area and the size of the ablation margin with great efficacy (11).

Finally, there are two considerations to be made:

First: from an oncological point of view, the article does not clarify if the revised studies on ablative therapies in the management of CRLM are related to synchronous or metachronous lesions and at what stage they are treated (at diagnosis? after chemotherapy or when patients were responsible to chemotherapy).

The results of two ongoing trials comparing ablation and liver resection [the COLLISION phase III randomized trial comparing thermal ablation and liver resection in patients with <3 cm CRLM (14) and the LAVA trial, designed to compare liver resection and ablative therapy in CRLM patients (15)], might provide more power evidence for an ever increasing role that ablation will have over time.

From an interventional point of view, certainly, the main message of the review is that MWSA must replace RFA in the management of CRLM without further adieu. MWSA will be performed with any of the 3 currently used approaches in clinical practice (open, percutaneous or laparoscopic), thanks to the aforementioned advantages of MWSA on RFA, together with the concomitant and effective help of IOUS and IO-CEUS.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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