The role of contrast-enhanced ultrasonography in image-guided liver ablations

ULTRA SONO GRAPHY

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LETTER

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We read with great interest the paper by Kim et al. [1] entitled "Local ablation therapy with contrast enhanced ultrasonography for hepatocellular carcinoma: a practical review," recently published in *Ultrasonography*. We think that contrast-enhanced ultrasonography (CEUS), together with the development of reliable navigation systems, is likely to represent one of the most important advances in image-guided ablations in recent years. Thus, we offer some considerations on the topic.

Percutaneous ablations, performed with different technologies, are increasingly used to treat a variety of conditions, including liver, kidney, and even neck tumors [2,3]. Whatever the technology, most procedures are performed under sonographic guidance, which provide a reliable, real-time, and cheap guidance method even in extremely complex conditions. However, in some cases, lesions may be not clearly detectable on ultrasonography, due to low conspicuity or when visibility is impaired by bones or aerated organs (i.e., the lungs and bowel). In these cases, the use of more complex guidance modalities, such as computed tomography (CT), magnetic resonance imaging (MRI), or even positron-emitting tomography (PET), have been reported [3]. However, all these methods imply an increased level of technical difficulty, longer procedure duration, and higher costs. Kim et al. [1] highlighted how the use of CEUS may help in performing liver ablations in cases of lesions not clearly visible on standard ultrasonography. We consider the intra-procedural use of CEUS of paramount importance for image-guided ablations. In our experience, CEUS has allowed for the immediate retreatment of patients with incomplete ablations. This implied a dramatic decrease in rate of repeat visit and repeat ablation, thus also remarkably reducing the overall costs per patient [4]. Unlike Kim et al. [1], we generally perform post-ablation CEUS after 5–7 minutes, as soon as the gas that developed during the procedure has disappeared. At 20–40 minutes, a peripheral hyperemic halo may be present, potentially mimicking the presence of a residual peripheral tumor.

However, even CEUS may not be sufficient to fully depict the lesion with full conspicuity in certain patients. Under these conditions, fusion imaging between ultrasonography and pre-acquired CT, MRI, or PET images, together with virtual navigation, may represent a valuable option [5]. In our experience, we were able to achieve correct targeting of lesions not thoroughly detectable at ultrasonography or CEUS in more than 90% of cases, thanks to the availability of a fusion system [5].

In conclusion, we think that CEUS, virtual navigation, and fusion systems may enable the application of minimally-invasive image-guided procedures to a larger population, potentially avoiding major surgery in a selected subset of patients.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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