Possibilities of contrast-enhanced ultrasound (CEUS) after percutaneous treatments of malignant liver lesions with perfusion software

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Aim: Using new perfusion software for evaluation of the success of treatments of malignant liver tumor lesions with CEUS.

Material and Methods: Retrospective analysis of 79 patients with 140 malignant liver lesions (size 9 mm-10 cm); 45 metastases, 95 HCC lesions. The success of percutaneous interventional treatments was evaluated by CEUS with perfusion imaging using special perfusion software. CEUS was performed after injection of 1-2.4 ml of sulfur hexafluoride microbubbles. Regions of interest (ROI) were manually placed in the center and the margins of the lesions as well as in the surrounding tissue. Using perfusion software Time to Peak (TTP), mean Transit Time (mTT), Rise-Time, wash-in rate were calculated.

Results: There were significant differences in all cases between the center compared to liver tissue for the main perfusion parameters (Peak, Rise Time, wash-in). There were also significant differences for Peak and wash-in when comparing defect and margins, also significant differences in Peak, Rise Time, and Wash-in when comparing liver tissue to the defect and the defect in comparison to the margins. For incompletely treated lesions there were only significant differences in Peak for the comparison between liver and defect as well as for defect versus margins.

Conclusion: Combination of CEUS with perfusion imaging with curve analysis and colour coded imaging enables a very critical analysis of successful treatment by percutaneous interventional procedures of malignant liver lesions.