

CE 3-D US for differentiating focal liver lesions

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A research team from Japan and China examined the potential role of contrast-enhanced three-dimensional ultrasonography (CE 3-D US) in characterizing focal liver lesions. Their results showed that CE 3-D US provides a spatial perspective for liver tumor enhancement, and could help in differentiating focal liver lesions.

Recently, contrast-enhanced (CE) ultrasound (US) appeared as an important modality to show the vascularity in the areas of interest, and has been used widely in clinical diagnosis of liver lesions. Three dimensional ultrasonography (3D US) allows three orthogonal planes to spatially demonstrate the features of subjects, which has been frequently used in fetal US. Different from the 2D images, CE 3D US acquires the data in a volume of interest (VOI) by automatically scanning with a desired angle and allows reconstruction of tomographic images in three orthogonal planes and renders angiogram-like images. The combination of 3D US and CE US can present the enhancement of lesions in [three dimensions](#) and also in parallel slices by multiple-planar visualization. Although many studies on differentiation among various focal liver tumors have been conducted using CE 2D US and recently a few using CE 2D US with Sonazoid, the exact value of CE 3D US with Sonazoid in the differential diagnosis of various focal liver tumors has not yet been clarified.

A research article to be published on May 7, 2010 in the [World Journal of Gastroenterology](#) addresses this question. This authors retrospectively evaluated tumor enhancement patterns, and the diagnostic criteria

established using dominant enhancement patterns were then applied to differentiation among focal liver tumors in a prospective study.

In the study, with analysis of the combination of the enhancement in three phases at CE 3D US, the dominant patterns were used as the diagnostic criteria for individual category, and prospective differentiation yielded a good sensitivity, specificity, high Az value, and good to excellent inter-reader agreement, which revealed the potential usage of CE 3D US in differentiating various focal liver lesions.

Although there were no significant differences between the prospective diagnosis at CE 3D US and that at CE 2D US, CE 3D US created a spatial and easily understood view for both hemodynamic and morphologic evaluation of focal [liver tumors](#), which were formed only in the doctors' imagination by 2D imaging using complex acquisition methods. The good to excellent inter-reader agreement in the authors' previous study about CE 3D US demonstrating characteristic enhancement of hepatocellular carcinomas (HCCs) have indicated CE 3D US can exhibit the characteristic enhancement of HCC tumors objectively.

More information: Luo W, Numata K, Morimoto M, Nozaki A, Ueda M, Kondo M, Morita S, Tanaka K. Differentiation of focal liver lesions using three-dimensional ultrasonography: Retrospective and prospective studies. *World J Gastroenterol* 2010; 16(17): 2109-2119.

www.wjgnet.com/1007-9327/full/v16/i17/2109.htm

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