**ULTRASOUND MONITORING OF VASCULARITY IN MURINE TUMORS**

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**Introduction –** This study developed contrast-enhanced ultrasound imaging techniques to monitor post-therapy reductions in tumor vascularity.

**Methods –**Imaging (7 to 15 MHz probe; HDI 5000, Philips) was performed on murine melanomas before and after their insonation [1 to 3 min; 1 to 3 MHz; continuous; $I_{SATA}$ = 2W.cm $^{-2}$]. In contrast-enhanced (0.02 mL Definity) power Doppler images, the percentage area of flow (PAF) was calculated as *n.100/N* (*n* = number of colored pixels; *N* = total number of pixels in the image). Also, delta-projection images of the tumors were constructed by tracking the running maximum of the grayscale difference between a contrast-enhanced (0.2 mL Definity) B-mode image sequence and a baseline.

**Results –** Following insonation, both contrast imaging techniques clearly showed qualitative and quantitative losses of tumor vascularity; PAF was significantly reduced. Delta-projections revealed microvessels (≥250 μm diameter) and better resolved the progressive filling of the neovasculature with the contrast agent. The delta-projection PAF measurements correlated linearly with those from the contrast-enhanced power Doppler images.

**Discussion –** The agreement between the two ultrasound imaging techniques is evidence that they were assessing the same tissue property: how well a region is perfused by the contrast agent. The delta-projection images better resolved the progressive filling of the neovasculature with the contrast agent. The difference may in part be due to the larger sample volume of the ultrasound pulses used in power Doppler images. Contrast-enhanced ultrasound is a useful tool for monitoring tumor vascularity and the role of antivascular therapies in small animals.

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