

**Efficacy of single breath-hold digital subtraction with multi-arteriportal MR images in hepatocellular carcinoma.**

K. Sasaki<sup>1</sup>, K. Ito<sup>1</sup>, T. Fujita<sup>1</sup>, A. Shimizu<sup>1</sup>, T. Tsukuda<sup>1</sup>, M. Hayashida<sup>1</sup>, N. Matsunaga<sup>1</sup>

<sup>1</sup>Radiology, Yamaguchi University Medicine, Ube, Yamaguchi, Japan

**Purpose:** This study was undertaken to determine visibility of hepatocellular carcinoma with single breath-hold digital subtraction of multi-arteriportal MR images.

**Materials and methods:** All examinations were performed with 1.5-T MR imaging system (Signa CVi; GE Medical Systems, Milwaukee, Wis) equipped with a phased-array torso coil. Fifty-two patients (114 lesions) with known hepatocellular carcinoma underwent six arterial phasic contrast-enhanced dynamic 3D gradient-echo sequences (TR/TE=3.4/1.1) with fat suppression at a routine abdominal examination. Lesion diameter was 4-30mm (mean, 14mm). We could obtain six arterial phase images with only single breath hold to coverage of the whole liver by using this sequences. Timing for starting first phase imaging was 10-second after intravenous administration of contrast agent. Sequential slice imaging was obtained in the transverse plane with a 10mm slice thickness and reconstruction with 5mm overlap. First phase imaging acquired during the same breath hold, was used as unenhanced imaging, and third phase imaging and sixth phase imaging was used as respective arterial and portal phase imaging. We obtained MR arterial perfusion images by subtracting first phase images from third phase images and MR portal perfusion images by subtracting third phases from sixth phase. We compared arterial phase (third phase) images and portal phase (sixth phase) images to MR arterial and portal perfusion images.

**Results:** The mean lesion-to-liver contrast ratio on the unenhanced phase, arterial phase, portal phase, arterial perfusion, and portal perfusion images was 1.14, 1.62, 1.29, 5.12, and 0.48, respectively. MR arterial perfusion images were statistically significant higher lesion-to liver contrast ratio than other images. The difference of lesion-to-liver contrast ratio between arterial perfusion images from portal perfusion images, were larger than the difference between arterial phase images from portal phase images.

**Conclusion:** This study suggests that MR arterial perfusion images were effective in detecting of hepatocellular carcinoma. Correct diagnosis of hepatocellular carcinoma might be achieved by high lesion-to-liver contrast ratio.