

## Evaluation of the Clinical Utility of High B value Diffusion Weighted Abdominal MR Imaging in Patients with Malignancy

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**Purpose:** To evaluate the added value of single breath-hold diffusion weighted imaging in oncology patients undergoing abdominal MR imaging.

**Materials and Methods:** 170 patients with known malignancy underwent abdominal MR imaging at 1.5T (Philips Gyroscan Intera, Best, The Netherlands) with a phased array surface coil. Conventional unenhanced breath-hold T1 gradient-echo, and T2-weighted TSE imaging was performed followed by dynamic gadolinium-enhanced 3D THRIVE imaging and delayed high resolution 2D gradient-echo imaging.

DW Images were obtained in axial plane with a single shot SE EPI sequence (TR=2532, TE=58, flip angle=90), by using a b value of 500 s/mm<sup>2</sup>. 24 slices were obtained during a 20 second breath-hold with slice thickness of 7 mm and interslice gap of 1 mm.

The routine unenhanced and dynamic gadolinium-enhanced images were reviewed and reported. Next the DW images and reference echo planar images were reviewed for the presence of additional findings. Overall image quality and the presence of artifacts were noted.

**Findings:** DW image quality was rated as excellent in 149, acceptable in 19, and poor in 3 patients. Additional findings were noted on the DW images in 85/170 (50%). In 70/170 (42%) the additional findings were clinically significant. In 23 (14%) patients the additional findings on the DWI could change patient management. The additional finding included lymphadenopathy in 54 patients, peritoneal tumor in 11 patients, renal lesions in 2 patients, solid liver lesions in 11 patients, bone metastases in 2 patients, and bowel, and adrenal lesions in one patient each. In three patients findings on the other MR sequences were resolved as benign findings on the DW images. In 11 patients with otherwise normal MR exams, significant findings were only visualized on the DW images. DWI images suppressed the high signal from ascitic fluid in patients and showed partial suppression of signal from bowel contents in all patients, increasing the conspicuity of adjacent tumor in the peritoneum and lymph nodes. The addition of DW images increased overall confidence in diagnosis in 130 (79%) cases.

**Conclusions:** DW abdominal imaging is feasible in a single breath hold and provides additional clinically important information in oncology patients when added to routine abdominal MR sequences.