

Analysis of the Utility of MR-DWI-lymphography in Detecting and Distinguishing Lymphoma from other Lymphadenopathies in the Body

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INTRODUCTION

Lymph nodes show high signal intensity on diffusion-weighted imaging (DWI) images with most of other organs suppressed with low signal intensity. As a new MR lymph nodes imaging technique, most of all studies about DWI-lymphography were focus on detecting and differentiating various lymphadenopathies in head and neck, seldom on lymphadenopathies in the body. Our study was to elucidate whether or not DWI is useful in detecting and differentiating lymphomas from other lymphadenopathies in the body.

MATERIALS AND METHODS

Thirty-three patients (16 males and 17 females, 29-70 years old, mean age=52.3 years) with suspected lymphadenopathy (10 malignant lymphomas, 16 lymph nodes metastases and 7 tuberculoses proved by surgery after MR examination) in the body were enrolled. All images were obtained on a 1.5-T MR scanner (Gyrosan Intera Master, Philips Medical Systems) using a four-channel body-coil phased array with Sensitivity Encoding (SENSE) technique and without breath-holding. Axial diffusion-weighted imaging (DWI) was obtained using a short T1 inversion recovery-spine echo-echo planar imaging (STIR-SE-EPI) sequence with the following parameters: TR/TE=6800/70 msec, T1=180 msec, b value=0 and 800 sec/mm², shot mode=single shot, EPI factor=47, SENSE factor=2, matrix=160×256, slice thickness/gap=4mm/0mm, NSA=14. The apparent diffusion coefficient (ADC) values of 122 lymph nodes (27 lymphomas, 78 lymph nodes metastases and 17 lymph nodes tuberculoses) dissected in surgery were calculated, and the ADC values obtained from the solid portion of the lesions was used to represent each lesion. The ADC values of three types of lymphadenopathies were compared.

RESULTS

The respective value of ADC for malignant lymphomas, lymph nodes metastases and lymph nodes tuberculoses were as follows: $0.652 \pm 0.09 \times 10^{-3} \text{mm}^2/\text{s}$, $1.008 \pm 0.191 \times 10^{-3} \text{mm}^2/\text{s}$ and $1.105 \pm 0.573 \times 10^{-3} \text{mm}^2/\text{s}$. The ADC value of the malignant lymphoma was significantly lower than that of lymph nodes metastases and tuberculosis ($p < 0.01$). When an ADC value of $0.846 \times 10^{-3} \text{mm}^2/\text{s}$ was used as a threshold value for differentiating malignant lymphoma from other lymphopathies, the best results were obtained with a sensitivity of 92.6%, specificity of 80%, positive predictive value of 56.6% and negative predictive value of 97.26%.

CONCLUSION

The addition of DWI to routine MRI provides useful physiological and functional information of lymph nodes lesions. Lymphoma seemed to have marked restriction in diffusion coefficients, and have the lower ADC value than other lymphadenopathies. MRI-DWI-lymphography may be a useful adjunct to conventional imaging in detecting and diagnosing lymphoma in the body.

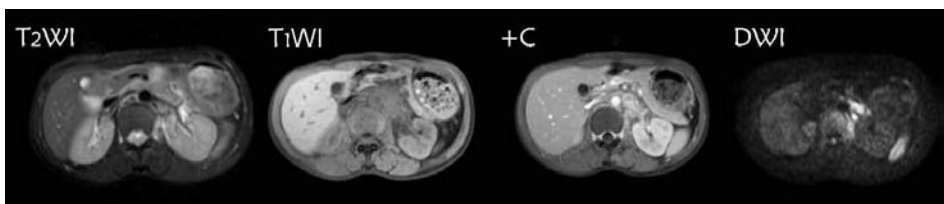


Figure1. 40-year-old man with retroperitoneal lymph nodes metastases from lung cancer. The ADC was $1.292 \times 10^{-3} \text{mm}^2/\text{s}$.

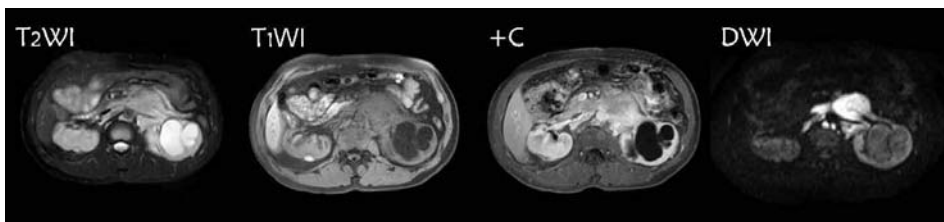


Figure2. 34-year-old man with retroperitoneal non-Hodgkin's lymphoma. The ADC was $0.677 \times 10^{-3} \text{mm}^2/\text{s}$.