

Applications of Diffusion-Weighted MRI in Uterine Tumors: Signal intensity and ADC value based ability in demonstration and differentiation

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Objective: To investigate the ability of DWI in demonstrating uterine benign and malignant tumors, and compare ADC values between these two kinds of tumor.

Materials and Methods: Total 73 lesions of 58 patients who underwent pelvic MR examinations in our hospital were included in the study. All were divided by pathologic results as benign group- 23 lesions (including leiomyoma, adenomyosis and endometrial polypus) and malignant group- 50 lesions (including cervical carcinoma, endometrial carcinoma, endometrial sarcoma). Take signal intensity ratio (SIR) and contrast to noise ratio (CNR) as the parameters in image evaluation of lesions' signal intensity contrast. Take normal uterine myometrium and obturator internus muscle as contrast areas. The signal intensities were compared between diffusion-weighted images and T2 weighted images. Signal intensity and ADC values of DWI were compared between benign and malignant groups. B value was 1000.

Results: In malignant group, SIR1(myometrium as contrast), SIR2(obturator internus muscle as contrast) and CNR1(myometrium as contrast) of DW images were higher than that of T2WI, with statistically significant differences. In benign group, however, only SIR2 was higher in DWI than T2WI. All four parameters of DWI in malignant group were significantly higher than that of benign group. ADC value of malignant group ($0.932 \pm 0.1909 \times 10^{-3} \text{mm}^2/\text{s}$) was significantly lower than benign group ($1.173 \pm 0.2232 \times 10^{-3} \text{mm}^2/\text{s}$) (see figure 1 on right), but the distribution of ADC value between endometrial adenocarcinomas and cervical squamous cancers had no difference.

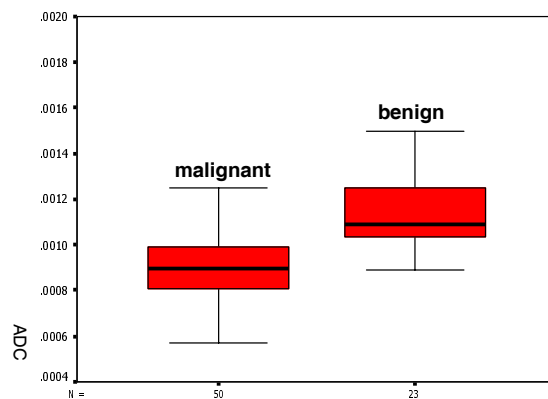


Fig. 1

Conclusion: Compared with T2 images, DWI has a stronger ability in highlighting malignant tumors of uterus, which is an advantage of DWI in demonstrating lesions. But such ability in demonstrating benign tumors is much weak. Malignant and benign uterine tumors have different ADC distributions, while that of endometrial adenocarcinomas and cervical squamous cancers are not different.

Keywords: diffusion-weighted imaging, uterine neoplasms, signal intensity

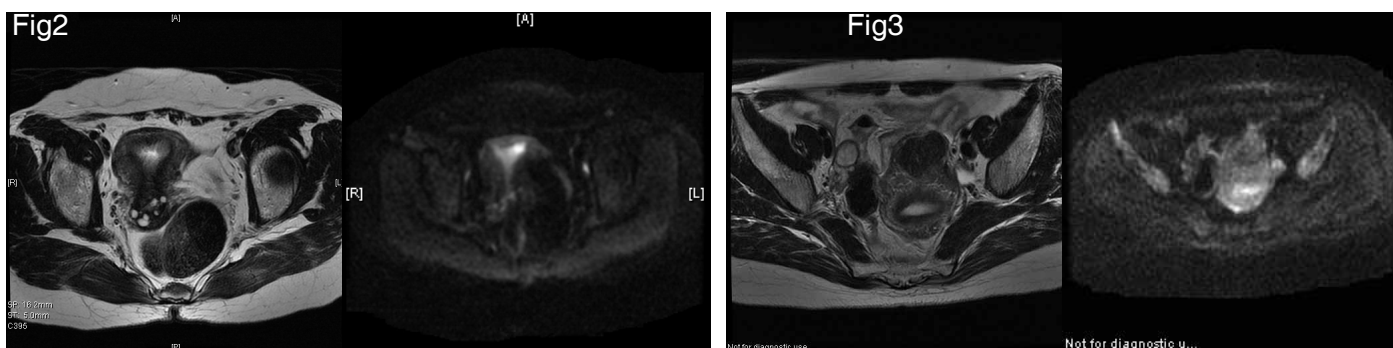


Fig2:Diffusion-weighted image(right) highlights the small lesion of endometrial carcinoma seen on T2WI(left).

Fig3:A leiomyoma clearly see on T2WI(left) is barely discerned on DWI(right).