Effect of diffusion weighted imaging for detection of prostate cancer-comparison between tissue types-

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Purpose DW imaging of cancer tissue have higher intensity than surrounding prostate tissues in very high b factors, and improves MRI detection of prostate cancer. But there is some false negative in this method. We performed ROC analysis of each tissue types of cancer and examine difference between them.

Materials and Method The study population consisted of 42patients who underwent radical prostatectomy or sextant biopsy probed prostate cancer and 31 patients with benign prostate hypertrophy (BPH), prostatitis and normal prostate shown by 2 or 3 biopsies and who had been followed up for over 8 months. All patients underwent MR imaging studies sequentially from January 2004 to October 2005.

Imaging was performed with a 1.5T MR imaging system (Excelart, Toshiba,Tokyo). Axial T2 weighted images with FSE sequence (TR 4000ms TE 102ms; flip angle90/160; field of view 25cmx25cm; matrix 192x320; excitations2; slice thickness 4mm)were obtained from the apex of the prostate gland to above the seminal vesicle. Axial diffusion weighted images were performed with gradually increasing b-factors(600 or 800,1000,2000,3000)

Three radiologists, blinded to the histo-pathological results, classified images into 6 categories (0.unreadable 1. normal 2. benign 3. benign, but malignancy cannot be ruled out 4. suspicious of malignancy 5. highly suggestive of malignancy). These evaluations were compared with resected specimens or biopsy specimens and were analyzed by means of receiver operating characteristic (ROC) analysis. ROC curve analysis of 3 readers were performed for each of the following combinations 1)benign prostate cases and well differentiated cancer 2) benign prostate cases and moderately differentiated cancer 3)benign prostate cases and poorly differentiated cancer

Results The areas under the ROC curve (Az) for each combinations were 1)0.512) 0.69 3) 0.84. These results showed that poorly differentiated cancer is most easy to detect cancer in prostate diffusion weighted imaging.

Conclusion and discussions DW images with very high b factors are useful to detect prostate cancer, and improves MRI detection of prostate cancer. But there is some false negative in this method. Especially, well differentiated cancer of prostate is sometimes falseegative.