# Apparent Diffusion Coefficient Value for Differentiating Pathology in Cervical Cancer at 3 Tesla

**G. Lin[1], K. K. Ng[1], Y. Y. Wai[1], J. J. Wang[1], C. H. Lai[2], Y. T. Huang[1], K. C. Ho[3], and T. C. Yen[3]**

[1]Department of Radiology, Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Taipei, Taiwan, [2]Department of Obstetrics and Gynecology, Division of Gynecologic Oncology, Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Taipei, Taiwan, [3]Department of Nuclear Medicine and Molecular Imaging Center, Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Taipei, Taiwan

## BACKGROUND

We design this study to investigate the feasibility of using apparent diffusion coefficient (ADC) value generated from 3T MRI diffusion-weighted image (DWI) for differentiating pathology categories of cervical cancer.

## MATERIALS AND METHODS

A total of 126 patients with biopsy proven cervical cancers were enrolled, including 94 patients of squamous cell carcinoma, 22 of adenocarcinoma, 7 of adenosquamous carcinoma, 3 of small cell carcinoma. Diffusion weighted echo-planar sequence was performed in 3T MRI (Magnetom Trio-Tim, Siemens) with body coil. The imaging parameters were TR/TE = 3390 ms/79 ms, field of view 350 mm x 320 mm, slice thickness 5 mm, acceleration factor 2. The diffusion weighting gradients were applied in three orthogonal directions using b factors of 0 and 1000 sec/mm$^2$ respectively. The DWI and T2-weighted images were fused for detailed anatomical localization. Mean ADC values of main tumors were measured using a manually placed irregular region of interest (ROI) in axial plane. Mean ADC values of different pathology categories were compared with ANOVA test, and a P value $\leq 0.05$ was determined to be statistically significant.

## RESULTS

Diffusion imaging in the cervical cancer is feasible with satisfactory image qualities and without major artifacts noticed. Fig. 1 showed the ADC image (in color) fused with the T2W image (in grayscale). Mean ADC value of adenocarcinoma ($0.96 \pm 0.21$ x $10^{-3}$ mm$^2$/s) was higher than that of squamous cell carcinoma ($0.84 \pm 0.11$ x $10^{-3}$ mm$^2$/s), adenosquamous carcinoma ($0.79 \pm 0.10$ x $10^{-3}$ mm$^2$/s), or small cell carcinoma ($0.53 \pm 0.10$ x $10^{-3}$ mm$^2$/s). Significant difference (p<0.001) was noted between groups, as shown in Fig 2.

## CONCLUSION

ADC value from 3.0T MRI-DWI is promising in differentiating pathology types of cervical cancer.
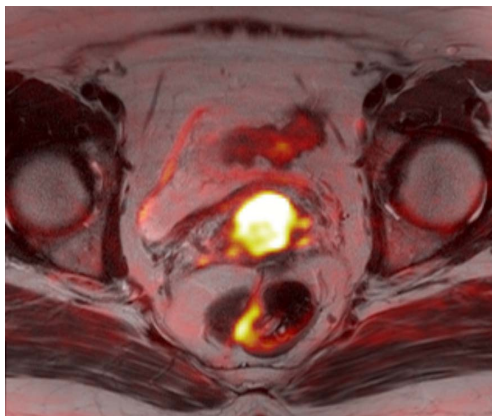
Fig 1.

Fig 2.