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ORIGINAL ARTICLE

# Apparent diffusion coefficient value in evaluating types, stages and histologic grading of cancer cervix



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## KEYWORDS

Apparent diffusion coefficient (ADC);  
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**Abstract** *Aim:* To determine whether the apparent diffusion coefficient (ADC) measurements calculated values were significantly different between cervical tumors with different histological characteristics (type, degree of differentiation, and stage of malignancy).

*Patients and methods:* MRI and DWI scans performed in 26 pathologically proved cancer cervix patients. ADC values of different pathological types of cervical cancer were compared. Student's *t* test was used for statistical analysis.

*Results:* There were 18 squamous cell carcinoma and 8 adenocarcinomas showed with biopsy results. Early stage (FIGO-Ib–IIa,  $n = 7$ ), (FIGO-IIb–IIIb–IVa,  $n = 19$ ). The mean ADC values for squamous cell carcinoma ( $n = 18$ ), and adenocarcinoma ( $n = 8$ ) were  $0.88 \times 10^{-3}$ , and  $0.91 \times 10^{-3} \text{ mm}^2/\text{s}$ , respectively. Statistical analysis showed significant difference in ADC value between both tumor types ( $P < 0.05$ ). There was also significant difference between the mean ADC values of the tumor grade I and the other grades (II, III) ( $p < 0.05$ ). The mean ADC values in early stage cervical cancer ( $0.83 \pm 0.05 \times 10^{-3} \text{ mm}^2/\text{s}$ ) were significantly lower than the mean ADC values in late stage disease ( $0.98 \pm 0.06 \times 10^{-3} \text{ mm}^2/\text{s}$ ) ( $p < 0.05$ ).

*Conclusion:* ADC value measurements can provide useful information in diagnosis of cervical cancer as well as in preoperative assessment of the tumor stage.

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## 1. Introduction

Uterine cervical cancer is the third most common malignancy affecting the female genital tract in middle age group between 45 and 55 years (1,2). Its incidence is increasing rapidly in developing countries. The International Federation

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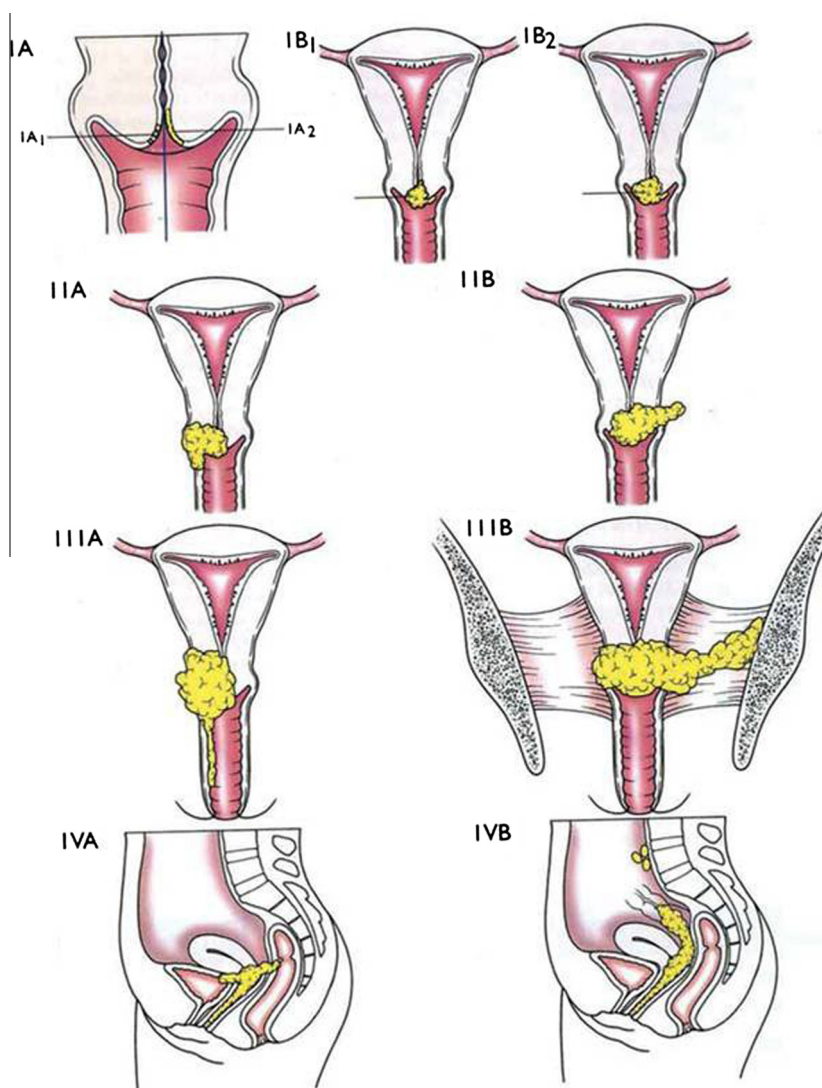
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**Table 1** FIGO staging for carcinoma of cervix (3). International Federation of Gynecology and Obstetrics (FIGO) Staging Systems.

• Stage 0:	Cervical intraepithelial neoplasia (CIN III)
• Stage I	Confined to cervix
Stage Ia	Invasive carcinoma only diagnosed by microscopy
Ia1:	Stromal invasion < 3 mm in depth and < 7 mm in extension
Ia2:	Stromal invasion > 3 mm depth and not > 5 mm and extension > 7 mm
Stage Ib:	Clinically visible lesions limited to the cervix or pre-clinical cancers > stage Ia
Ib1:	Clinically visible tumor > 4 cm in greatest dimension
Ib2:	Clinically visible tumor > 4 cm in greatest dimension
• Stage II:	Beyond cervix though not to the pelvic sidewall or lower third of the vagina
Stage IIa:	Involves upper 2/3rd of vagina without parametrial invasion
Stage IIa1:	Clinically visible tumor > 4 cm in greatest dimension
Stage IIa2:	Clinically visible tumor > 4 cm in greatest dimension
Stage IIb:	With parametrial invasion
• Stage III	
Stage IIIa:	Tumor involves the lower third of the vagina with no extension to pelvic sidewall
Stage IIIb:	Extension to pelvic side wall or causing obstructive uropathy
• Stage IV:	Extension beyond pelvis or biopsy proven to involve the mucosa of the bladder or the rectum
Stage IVa:	Extension beyond pelvis or rectal/bladder invasion
Stage IVb:	Distant organ spread

**Fig. 1** Staging of uterine cervix carcinoma according to FIGO (4).

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