Brachytherapy in Cervical Cancer: Accuracy in Point Dose Demarcation

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Brachytherapy dose specification point A, located 2 cm superior to the external cervical orifice and 2 cm lateral to the cervical canal, is a geometrical concept that represents the anatomic position where the uterine artery crosses the ureter. The study aimed to determine how well the Manchester point A represents the true anatomical point A (APA). The relationship between high - risk-clinical target volume (HRCTV) dimensions and the position of APA is also assessed to discuss the possibilities of individualizing the point-based brachytherapy. In this quantitative study, diagnostic contrast-enhanced computed tomographic scans of 48 patients with Carcinoma of the cervix/ endometrium were reviewed retrospectively. The same geometric coordinate system as Manchester point A was established; APA and HR-CTV were located and contoured on the CT data. Maximum HR-CTV dimensions on AP projection and coordinates of APA were recorded to assess correlations. The mean APA of the sample was at a vertical level of 1.18±0.35 cm from the external-orifice along the uterine axis and 3.63±0.52 cm laterally to either side. A significant moderate positive correlation exists between HRCTV dimensions and APA position. An approximate individualized Point A is defined using this correlation as a function of HR-CTV dimensions, which can easily be measured from radiotherapy planning CT scans. The proposed model is useful in a 3D-brachytherapy setup for individualized dose recording and can be used in a 2D-brachytherapy setup to individualize dose prescription if proven applicability.

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