

ABSTRACT

Endometrial cancer is one of the most common gynecological malignancies treated with a combination of external beam radiotherapy (EBRT) and brachytherapy. The success of brachytherapy depends on its ability to deliver an optimal dose to the High-Risk Clinical Target Volume (HRCTV) while limiting the dose to the Organs at Risk (OARs). This study aimed to evaluate the dose distribution to the HRCTV, bladder, and rectum using the Equivalent Dose in 2 Gy Fractions (EQD2) in patients with endometrial cancer treated with three-dimensional conformal radiotherapy (3D-CRT) brachytherapy using a cylindrical applicator at the Radiotherapy Department of Dr. Sardjito General Hospital, Yogyakarta. This descriptive quantitative study used secondary data from 21 patients who underwent HDR brachytherapy with a prescribed dose of 6 Gy per fraction for three fractions. Dose evaluation was performed using the HRCTV D90 and D2cc parameters for the bladder and rectum. EQD2 was calculated using the Linear-Quadratic model with an α/β ratio of 10 Gy for the tumor and 3 Gy for the organs at risk. The results showed that the mean total EQD2 for the HRCTV was 89.7 Gy, meeting the EMBRACE II recommendation (≥ 85 Gy). The mean total EQD2 values for the bladder and rectum were 68.0 Gy and 67.8 Gy, respectively, both remaining below the EMBRACE II hard constraint limits. Only one patient had an HRCTV dose below the planning target due to the close anatomical proximity of the rectum to the target volume. In conclusion, 3D-CRT brachytherapy using a cylindrical applicator provided adequate target dose coverage while maintaining OAR doses within the recommended safety limits.

Keywords: *endometrial cancer, 3D-CRT brachytherapy, organs at risk.*