

ABSTRACT

This study aimed to evaluate the quality of Volumetric Modulated Arc Therapy (VMAT) treatment plans for lung cancer using ICRU Report 83 parameters at RSUD Prof. Dr. Margono Soekarjo Purwokerto, employing a retrospective descriptive-analytic method on 21 VMAT treatment plans created using TPS Monaco v5.40 on the Elekta Versa HD linac, encompassing the evaluation of D2%, D98%, D50%, Homogeneity Index (HI), Conformity Index (CI), and organs at risk (OAR) doses including lung V20, Mean Lung Dose (MLD), spinal cord Dmax, and mean heart dose. The results demonstrated that 95.2% of patients met the D2% threshold of <107% of the prescribed dose, all patients achieved 95% coverage, and the mean D50% of 61.11 Gy closely approximated the prescribed dose of 60 Gy, while all 21 patients (100%) presented HI values ≤ 0.2 (mean 0.1178) and $CI \geq 0.9$ (mean 0.9631), satisfying the recommended homogeneity and conformity standards, with OAR compliance rates highest for mean heart dose (90.5%), followed by lung V20 (85.7%), spinal cord Dmax (81.0%), and MLD (71.4%), where cases exceeding OAR constraints were generally associated with large PTV volumes or tumor locations in close proximity to the spinal cord. Overall, the VMAT treatment plans for lung cancer generated by TPS Monaco and the Elekta Versa HD linac at RSUD Prof. Dr. Margono Soekarjo Purwokerto met quality standards based on ICRU 83 parameters, and these findings may serve as a reference for the radiotherapy quality assurance program at the institution.

Keywords: VMAT, lung cancer, ICRU 83, Homogeneity Index, Conformity Index, organ at risk, Monaco, Elekta Versa HD