

RESULTS OF AVERAGE CRITICAL ORGAN DOSE IN WHOLE BREAST RADIOTHERAPY WITH TOMOTHERAPY

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Introduction - Purpose : After breast-conserving surgery, adjuvant radiotherapy requires maximum protection for the lungs, esophagus, and heart especially in the left breast radiations, while achieving an acceptable dose distribution across the whole breast. With tomotherapy, all breast irradiation is done with intensity-adjusted radiotherapy, and critical organ doses can be drawn below the desired dose limits. In this study, we evaluated the mean critical organ doses of patients who underwent breast conserving surgery and who underwent whole-breast radiotherapy with tomotherapy.

Methods - Tools : Twenty patients' plans were evaluated retrospectively in our study. Eleven of the patients had left breast and 9 had right breast cancer. The treatment dose were 50 Gy in 25 fractions to be desired. Simulation CTs, which were fixed with breast board of patients with breast tumors, were sent to the treatment planning station. Target volumes and critical organ contours were drawn and CT and contour data were transferred to the planning system. In the planning system, dose volume histograms were generated for each critical organ and target volume. A cylindrical complete block was placed in the lower lobe of the side lung to reduce the side lung dose. In the treatment mode, the cross-sectional thickness 5 cm (Jaws width), modulation 3 and the pitch 0.287 were determined.

Findings : For a total of 20 patients; The mean duration of treatment was 4.4 minutes. For nine right breast patients, the mean dose of side lung was 4.18 Gy; for 11 left breast patients were 4.80 Gy. For all patients, when evaluating the side-lung volume received 5 Gy dose, The V5 value was 22.20%. When the average critical organ doses are evaluated; the heart was 5.04 Gy, the contralateral breast dose was 4.66 Gy, and the ophagus was 1.32 Gy

Discussion : When homogeneous dose distribution is achieved in target volumes in all breast intensity modulated radiation therapy with HelicalTomoterapy, very low doses can be achieved especially in critical organs such as the side lung.

Keywords: Breast cancer, IMRT, critical organ doses, helical tomotherapy