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A dosimetric comparison of the 3D-CRT planning of chest wall in post-mastectomy breast cancer patients, with and without breast board setup

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Purpose: Breast boards are used in breast radiation which increases normal lung and heart doses, when supraclavicular field is included. Therefore, in this study through dose volume histogram (DVHs), lung and heart doses comparison was done between two different setups i.e. with and without breast board, for the treatment of left chest wall and supraclavicular fossain postmastectomy left breast cancer.

Materials & Methods: In this study, CT-simulation scans of ten breast cancer patients were done with and without breast board, at Shifa International Hospitals Islamabad, to investigate the differences between the two different setups of the irradiation of left chest wall in terms of lung and heart doses. For immobilization, support under the neck, shoulders and arms was used. Precise PLAN 2.15 treatment planning system (TPS) was used for 3D-CRT planning. The total prescribed dose for both the plans was 5000 cGy/25 fractions. The chest wall was treated with a pair of tangential photon fields and the upper supraclavicular nodal regions were treated with an anterior photon field. A mono-isocentric technique was used to match the tangential fields with the anterior field at the isocentre. The dose volume histogram was used to compare the doses of heart and ipsilateral lung.

Results: Both the plans of each patient were generated and compared. DVH results showed that for the same PTV dose coverage, plans without breast board resulted in a reduction of lung and heart doses compared with the plans with breast board. There was significant reductions in V20, V<25 and mean doses for lung and V<9 and mean doses for heart.

Conclusion: In comparison of both the plans, setup without breast board significantly reduced the dose-volume of the ipsilateral lung and heart in left chest wall patients.

Biography

Ambreen Muzaffar alongside being an experienced Medical Physicist from the last six years is keeping her dream alive and currently progressing with her research work towards completion of MPhil. She is aiming towards excelling in the field of Medical Physics. Currently, she is an active participant in the overall initiative of her organization for achieving JCI accreditation. She is in possession of multidimensional technical and professional skills such as Precise Treatment Planning System 2.15 (3DCRT/IMRT), Eclipse Treatment Planning System 13.5 (3DCRT/IMRT), Multidata Treatment Planning System (Multi Slices) (2D), using ARIA 13.5 for VARIAN LINAC, Using MOSAIQ for Elekta LINAC. Her work was 3-D treatment planning of chest wall/breast using monoisocentric technique with junction verification, and Intensity modulated radiation therapy in organ confined/locally advanced prostate cancer. She has presented at conference in March 2013 held by PSCO. Her current ongoing researches include radiation of setup errors in SIB-IMRT of head and neck cancers as a part of her course work towards MPhil in Physics in "small field dosimetry-comparison of Monte Carlo simulations with experimental measurements".

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