ONCODAILY MEDICAL JOURNAL

abstract

Dosimetric evaluation of organs at risk in moderate hypofractionation (43.5 Gy) VS conventional (50 Gy) in postmastectomy locally advanced breast cancer radiotherapy

Hareem Khalid, Karim Bakhsh Bhutto, Sehrish Abrar, Sabeen Zafar

DOI: 10.69690/ODMJ-018-3101-6558

AMSTRO
Asia and Middle East Society of Therapeutic Radiation and Oncology
Affiliated with ASTF

abstract

Dosimetric evaluation of organs at risk in moderate hypofractionation (43.5 Gy) VS conventional (50 Gy) in postmastectomy locally advanced breast cancer radiotherapy

Author: Hareem Khalid[1], Karim Bakhsh Bhutto[1],Sehrish Abrar[1], Sabeen Zafar[1]

Affiliation: [1]Sindh Institute Of Urology and Transplantation, Pakistan

DOI: 10.69690/ODMJ-018-3101-6558

Introduction: Conventional postmastectomy radiotherapy (PMRT) delivers 50 Gy in 25 fractions. Comparable tumor control, reduced toxicity, and shorter treatment duration is offered by Moderate hypofractionation (43.5 Gy in 15 fractions). This study evaluates dosimetric variations between the two regimes in chest wall and nodal irradiation.

Methodology: Sixteen postmastectomy patients with locally advanced breast cancer (May–Aug 2025) were included in this cross-sectional study. Separate IMRT and 3DCRT plans were generated in Monaco for both fractionation schedules, targeting chest wall and regional nodes. Organs at risk (heart, esophagus, spinal cord, ipsilateral lung, contralateral breast, humeral head) were contoured, and plans were evaluated using QUANTEC constraints. Dose–volume histograms were analyzed.

Results: Both regimens achieved adequate target coverage and met dose constraints. For 43.5 Gy/15 vs 50 Gy/25, heart Dmean was 3.76 vs 3.43 Gy, esophagus Dmean 4.60 vs 4.93 Gy, ipsilateral lung V20 28.05% vs 31.02%, contralateral breast Dmean 2.64 vs 1.80 Gy, spinal cord Dmax 12.03 vs 12.84 Gy, and humeral head Dmax 24.98 vs 30.37 Gy. Reduced ipsilateral lung and humeral head doses observed in hypofractionation with comparable heart and esophagus exposure but slightly higher contralateral breast dose. IMRT showed improved conformity and OAR sparing compared with 3DCRT, though both were clinically acceptable.

Conclusion: This dosimetric study demonstrates that moderate hypofractionation (43.5 Gy/15) achieves organ-at-risk sparing comparable to conventional 50 Gy/25 with reduced treatment duration. These findings support its safe integration into postmastectomy breast cancer radiotherapy using IMRT and 3DCRT. Future prospective studies will be directed toward clinical validation and patient outcome assessment.

Conflict of interests: The authors declare no conflict of interests.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.