**Role of Post Mastectomy Radiation Therapy Boost in Invasive Breast Cancer Patients. Is It Needed?**

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**Purpose/Objective(s):** Despite the lack of evidence supporting the benefits of radiation boost dose (BD) for patients undergoing post mastectomy radiation therapy (PMRT), BD is still being used widely. The purpose of this study is to investigate the disease control effects of BD.

**Materials/Methods:** We retrospectively reviewed 1195 patients treated at our institution from 1990 to 2016. Patients were divided into 2 groups; PMRT with boost (705 patients) and PMRT without boost (490 patients). Patient demographic data, clinical data, pathological features and the treatments received were collected from the patients’ records. The patients were followed up to assess the difference between the 2 groups in the locoregional recurrence and disease free survival (DFS). The analysis was done comparing the two groups as well as the subgroup analysis for the patients with high-risk features including positive LNs, lymphovascular invasion (LVI), and positive margins.

**Results:** The median follow up was (72.3 months) for the boost dose group and (62.9 months) for the no boost dose group. The two groups were well balanced in terms of both demographic and pathologic features. There was no significant difference in the number of patients who received chemotherapy, hormonal therapy, and immunotherapy. 299 patients (42.4%) in the boost group and 162 patients (33%) in the no boost group received neoadjuvant treatment which was significant (p=0.0007). Patients in the no boost group had significantly more reconstruction (58.9% vs 48.9% p=0.001). Regarding the radiation therapy, the 2 groups had the same median tangential dose 50 Gy. supraclavicular and internal mammary fields were used more significantly in the boost group (82.5% vs 52% in the supraclavicular and 36.9%vs 18.4% in the internal mammary p=0.0001). The median radiation boost dose was 10 Gy and used en face electrons field covering the chest wall and scar. In the group, which received radiation boost, 6.7% developed locoregional recurrence compared to 8.4% in the no boost (P=0.27). On univariate analysis Adding boost dose did not significantly affect locoregional recurrence (OR=0.8p=0.268). Subgroups analysis for high risk patients including positive margin, positive LNs and LVI didn’t show significant difference in the locoregional recurrence (p=0.13, p=0.05, and p=0.23 respectively). On multivariant analysis there was no significant correlation in locoregional recurrence between the 2 groups (OR 0.8 and p=0.25). The 5-year DFS was 74.4% in patients receiving boost radiation and 73.6% in the no boost group (p=0.78). This demonstrates that receiving boost radiation does not influence DFS.

**Conclusion:** In breast cancer patients receiving PMRT, adding a radiation boost had no significant role in improving local disease control even in high-risk patients. A prospective randomized trial may be needed to confirm that omitting boost in the PMRT settings will not affect patient outcome.