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TITLE
Long-Term Outcomes of Postmastectomy Radiotherapy: A 30-Year Experience

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HYPOTHESIS:
To assess long-term disease control and cardiovascular (CVD) and pulmonary events in breast cancer (BC) patients treated with postmastectomy radiation therapy (PMRT).

BACKGROUND/AIMS:
To assess long-term disease control and cardiovascular (CVD) and pulmonary events in breast cancer (BC) patients treated with postmastectomy radiation therapy (PMRT).

METHODS:
Under IRB approval, the medical records of 411 women (418 breast cancers) treated with PMRT at a single institution from 1984 to 2004 were reviewed. The chest wall (CW) and internal mammary nodes (IMC) were treated with en face electrons to reduce dose to underlying structures; for breast reconstructions, shallow CW tangents were matched to IMC electron fields.

Stage distribution was as follows: 0, 3%; I, 10%; II, 39%; III, 47%. Median age was 55 yrs (24-84). Median doses to the CW and boost fields were 50 Gy (30-60) and 10 Gy (6-25). Adverse events were scored per Common Terminology Criteria for Adverse Events v.4.0. SAS and JMP software were used for statistical analysis, the Kaplan- Meier product limit method for estimates of freedom from outcomes, the log-rank test for differences between prognostic strata, and the proportional hazards regression for multivariate analysis (MVA).

RESULTS & CONCLUSIONS
Median follow-up was 11.2 yrs (0.1-30.9). At 10 and 15 yrs, overall survival (OS) rates were 61.8% and 48.4%; cause-specific survival (CSS) rates were 70.6% and 62.3%, and disease-free survival (DFS) rates were 72.9% and 70.4%. At last follow-up, 43% of patients were alive (41% without disease and 2% with disease). Cause of death was BC in 26%, CVD in 5.6%, pulmonary disease in 0.5%, intercurrent disease in 11%, and unknown in 11%. Rates of recurrence in the CW, regional nodes, distant sites, and new contralateral breast primaries were 2.9%, 0%, 10.9%, and 0.0% in stage I; 3.3%, 1.4%, 24%, and 8.3% in stage II; and 7.2%, 5.4%, 37.5%, and 5.6% in stage III patients. Grade ≥3 CVD events occurred in 49 patients (12%) and pulmonary events in 15 patients (3.5%).

On MVA, DFS was correlated with stage (p=0.0043); OS with stage (p=0.0043) and age (p<0.0001); and freedom from post-treatment CVD with age (p=0.0965) and pretreatment CVD (p=0.0009). Breast laterality, race, receptor status, and treatment technique (tangents vs. elections) were not correlated with any long-term outcome.

DFS was stable after 10 yrs, but OS and CSS rates declined, consistent with age and late treatment effects. Associations have been noted between post PMRT CVD and cardiac DVH parameters and/or left-sided breast cancer. The techniques used in this study minimized cardiac and lung exposure in both right and left-sided breast cancer patients, suggesting that careful techniques may lessen the risk of late effects, but pretreatment CVD and age are risk factors that persist. The high rate of local-regional progression in stage III patients suggests an opportunity for radiation dose escalation and/or intensification to impact overall DFS and OS.