AbstractID: 5440 Title: Simultaneous Integrated Boost Utilizing IMRT for the Treatment of Breast Cancer

Introduction:
We compare the dosimetric characteristics of simultaneous integrated boost (SIB) technique utilizing IMRT vs. conventional treatment consisting of medial and lateral tangents followed by an electron boost.

Materials and Methods:
To date, 5 women at our institution have been enrolled and treated using IMRT with SIB. Patients were treated using 25 fractions of 1.8 Gy to the whole breast (45Gy) while concurrently receiving 25 fractions of 2.4 Gy to tumor bed (60Gy). Conventional treatments were planned using the standard fractionation of 1.8 Gy x 25 fractions to the whole breast followed by 2 Gy x 8 fractions to the tumor bed.

The patient data was used to compile population dose volume histograms (pDVH), based on the mean values and include error bars which represent the 1σ uncertainty of the mean.

Results:
The mean percent of the BoostPTV volume receiving 60Gy, was slightly higher for the conventional technique compared to SIB (Conventional = 98±1.4%, SIB=95.0±1.0%). The mean volume of the treated breast outside the BoostPTV, PTV45-Boost, that received greater than 120% of the prescribed dose was more in the Conventional technique then SIB (Conventional=15.9±3.4%, SIB=6.1±1.6%). The mean volume of lung receiving 20Gy was equivalent in both techniques (Conventional=19.8±5.8%, SIB=17.1±5.2%). The mean ipsilateral lung dose was equivalent between techniques (Conventional=10.7±2.2 Gy, SIB=11.9±4.2 Gy). The mean dose to contralateral breast was systematically higher in SIB technique compared to the conventional technique (Conventional=69±39 Gy, SIB=191±126 Gy). The mean volume of the heart that received greater then 30Gy was small for both plans (Conventional=2.8% and SIB=0.4%).

Conclusion:
IMRT with SIB is feasible and allows patients to complete EBRT in about 20% less time than the standard treatment course. It offers improved dose homogeneity to treated breast, comparable normal tissue sparing, and excellent short term cosmesis.