Purpose: To evaluate the dose distribution of target volume and normal tissues in forward intensity modulated radiotherapy (f-IMRT) and inverse intensity modulated radiotherapy (IMRT) plans for breast cancer after radical mastectomy.

Methods: Ten patients with breast cancer who received radical mastectomy were enrolled in this study. On each patient’s CT images the supraclavicular, chest wall and internal mammary areas were delineated. F-IMRT and IMRT plans were performed for each patient. The prescription dose was 50 Gy in 25 fractions. F-IMRT plans for the supraclavicular and the chest wall area using 6 MV X-ray irradiation; internal mammary area with 9-12 MeV electron irradiation, according to the three regions of dose adjust the doses of cold and hot fit. The supraclavicular, chest wall and internal mammary area were considered as a whole target in the IMRT plans, using 6 MV X-ray. The dose-volume parameters of target volume and normal tissues, CI and HI of f-IMRT and IMRT plans were analyzed, using paired t-test.

Results: The target volume coverage of f-IMRT plans were similar to that of the IMRT plans (93% and 94.5%). The mean CI and mean HI were 0.67±0.02/1.18±0.02 in f-IMRT and 0.75±0.03/1.14±0.01 in IMRT (P<0.05). The differences of V10, V20, V25, V30 and Dmean of ipsilateral lung were not statistically significant. However, the V15 of ipsilateral lung in IMRT was 4.5% less than that in f-IMRT, which was statistically significant (P<0.05). There was no significant difference in Dmean and V30 of heart, Dmean of contralateral lung and contralateral breast between two modes.

Conclusions: Compared with f-IMRT, IMRT plans resulted in better conformal dose distribution and homogeneity, with comparable target volume coverage and sparing of lung, heart and contralateral breast.