AbstractID: 6596 Title: Internal Mammary Lymph Node Irradiation after Breast Conservation Surgery: Analysis for the Correlation between Radiographic Pulmonary Change and Dose-Volume Histogram Parameters

Purpose: To evaluate the association between radiation pneumonitis (RP) and dose-volume histogram (DVH) parameters and to provide practical guidelines to prevent RP in radiation therapy (RT) for breast cancer including internal mammary lymph nodes (IMNs).

Method and Materials: Eighteen patients with early breast cancer who underwent partial mastectomy were involved in this study. Entire breast, supraclavicular lymph nodes, and IMNs were irradiated with total 50.4 Gy in 28 fractions. Partially wide tangential field technique and Photon-electron mixed field technique were used. Radiological pulmonary change (RPC) was examined according to modified Arriagada classification and symptomatic radiation pneumonitis (SRP) according to RTOG/EORTC morbidity scoring scheme. DVH parameters were compared between two groups, one with grade<2 RPC and the other with grade≥2 RPC.

Results: Of the 18 patients, 8 developed RPC with grade 2 (44%) and other 10 patients did not develop RPC with grade 0 (56%). Only one patient developed SRP with grade 1. For mean lung dose (MLD), V10 (percent lung volume receiving equal to and more than 10 Gy), V20, V30, V40, and normal tissue complication probability (NTCP), means values were 21.3±1.2 Gy, 37.0±10.4%, 30.1±7.1%, 26.4±6.7%, 20.2±6.1%, and 32.5±9.1% for the group with grade<2 RPC, respectively and 23.0±3.4 Gy, 41.0±10.1%, 35.1±6.3%, 31.3±5.1%, 24.9±5.1%, and 52.9±22.7% for the group with grade≥2 RPC, respectively. In the logistic regression test, V20, V30, V40, and NTCP showed statistically significant differences between two groups. MLD and V10, however, did not show significant differences between two groups.

Conclusions: Among DVH parameters, V20, V30, V40, and NTCP could be used as predictors of RPC after RT of IMNs in breast cancer. In clinical practice, we can suggest that RPC is not likely to be developed below the values of 28% for V20, 26% for V30, 19% for V40, and 30% for NTCP.