Conclusion: In the light of the dosimetric results herein reported, the cardiac structures should be contoured for plans optimisation and evaluation, especially when high conformal techniques are employed.

Material and Methods: 10 radiation therapy treatment plans were prepared for both IMRT and VMAT. The prescribed dose was 45 Gy in 2.25 Gy per fraction (overall treatment time - 4 weeks). The dose distributions were evaluated in terms of: the volume of the CTV and PTV which receives 90% and 95% of prescribed dose; the volume of the left lung which receives 20 Gy or more (VL20); the mean dose to the left lung; the volume of the heart which receives 20 Gy or more (VH20); the mean dose to the heart; the volume of the both lungs which received 20 (VLR20) and 30 Gy (VLR30) or more; the mean dose to the both lungs; the number of monitor units (MU) per single fraction. To evaluate differences between techniques, the Wilcoxon matched-pair signed rank test was used.

Results: Radiation therapy plans for both VMAT and IMRT fulfilled all criteria required by the treatment protocol in dose constraints for target volumes and organs at risk (OAR). VL20 was non-significantly higher in VMAT (28%) than IMRT (25.8%). The mean dose to the left lung was 10.3 Gy in VMAT, and 15.7 Gy in IMRT. The mean dose to the heart was 11.5 Gy in IMRT and 11.6 Gy in VMAT. VH20 was higher in VMAT than in IMRT plans: 10.6% vs 7.8% respectively. VLR20, VLR30 and the mean dose to the both lungs were similar in both techniques (VLR20 IMRT: 11.5% vs VMAT: 12.4%; VLR30 IMRT: 5.8% vs VMAT: 6.3%; the mean dose to the both lungs IMRT: 9.7 Gy vs VMAT: 10.2 Gy respectively). There were no significant differences between IMRT and VMAT in doses to CTV, PTV and OAR. The number of MU was significantly lower in VMAT plans (VMAT: 641 MU vs IMRT: 1049 MU, p <0.007).

Conclusion: VMAT and IMRT produced similar dose distribution in the CTV and PTV, and similar OAR dose sparing. However, the number of MU in VMAT was significantly lower than in IMRT. The decrease in the number of MU, and consequently the treatment time, may reduce the influence of intrafraction movement on dose distribution. It also allows to treat more patients in the same unit of time.

EP-1704 Helical Tomotherapy for left-sided breast: dosimetric comparison to Volumetric-Modulated Arc Therapy

F. Ertan1, R. Tanriseven1, O. Yazici1, A.M. Kocer1, M.B. Altmundas2

1Ankara Oncology Hospital, Radiotherapy, Ankara, Turkey
2Oncology Hospital, Radiotherapy, Ankara, Turkey

Purpose or Objective: The aim was to evaluate the dose distribution of target volume and organs at risk (OARs) using helical tomotherapy (HT) and volumetric modulated arc therapy (VMAT) for left sided breast cancer patients.

Material and Methods: We compared two techniques for ten left sided breast cancer patients. Planning target volume (PTVchrestwall) includes left sided chest wall and PTVSCF-AKS contains supraclavicular, axillary lymph nodes. The delivered dose was 50Gy within 25 fractions. The generated plans were evaluated in terms of dose distribution of PTV, doses of left lung, heart, contralateral breast and total monitor units. During CT simulation, the patient was positioned supine on a breast board. The patient’s left arm raised above the head and the head turned to the right side. CT slices were obtained at 3 mm intervals extending from the chin to the upper abdomen during free breathing. Tomotherapy planning parameters; the field width, modulation factor and pitch, were assigned to 5cm, 2 and 0.287, respectively, for all plans. To decrease right lung dose, the complete block was applied. For VMAT planning parameters, two half arc were used and the angle was addressed according to patient’s anatomy. The plans were constructed using Anisotropic therapy (VMAT) is a combination of IMRT and the arc technique. The use of gantry rotation during irradiation allows for very fast and accurate delivery of the planned dose. The aim of this study was to evaluate the usefulness of VMAT for patients who receive a post-left-sided-mastectomy chest wall irradiation.