Gantry angle started at 181 degree, stopped at 35 degree, and the 240-300 degree was set to be avoidance sector. Two half arcs were for left-side breast and axillary nodes. Gantry angle started at 153 degree, stopped at 282 degree, and the 0-90 angle was set to be avoidance sector. One quarter arc was for internal mammary node. Gantry angle started at 179 degree, stopped at 270 degree, and the 60-120 angle was set to be avoidance sector. The dose-volume histogram were evaluated the target homogeneity and conformity and normal tissue tolerance dose.

Results: MVMAT has significantly (p-value = 0.031) decreased right-side breast dose (V5Gy (%) = 39.9 ± 7.6), and has significantly (p-value = 0.005) decreased right lung dose (V5Gy (%) = 23.6 ± 7.3). Slightly less heart and left lung dose are found for MVMAT (heart V10Gy (%) = 45.7 ± 17.4, left lung V10Gy (%) = 48.6 ± 3.4) than in VMAT (heart V10Gy(%)=55.7 ± 19.9, left lung V10Gy(%)=53.4 ± 5.1). MVMAT for advanced left-side breast cancer retains target homogeneity and coverage when compared to VMAT.

Conclusion: MVMAT is suitable for advanced left-side breast cancer treatment. It retains target homogeneity and coverage and decreases the dose of right breast and right lung.

Purpose or Objective: Voluntary moderately deep inspiration breath hold (vmDIBH) reduces the heart dose for radiotherapy of left-sided breast cancer patients. For locoregional breast cancer patients, the application of vmDIBH requires high reproducibility to assure the absence of gap or overlay between tangential breast fields and supraclavicular irradiation fields. In this study we present a simple and fast visual method to quantify movement around the junction of the tangential and supraclavicular fields. The simple method is evaluated by testing the target volume reproducibility using two consecutive CT-scans during vmDIBH. Heart position reproducibility is assessed as well, with the resulting dosimetric consequences.

Material and Methods: For 80 consecutive breast cancer patients cranial-caudal (CC) displacement around the clavicle was quantified between five vmDIBHs. This was done in the CT room, before obtaining the planning CT scan. Intersecting CT laser lines were marked on tape and the maximum displacement was measured. This tape was positioned midclavicularly, with the horizontal laser lines on the junction line.

For 19 patients who would be irradiated locoregionally, a second CT scan was additionally acquired. The CC displacement of the left clavicle between the two breath holds was quantified by contouring the clavicle in both CT scans, and rigid registration of the two volumes in ProSoma (v.3.3.266, Medcom, Darmstadt, Germany) virtual simulation software.

The heart was delineated in both CT scans, excluding the great vessels. The two volumes were registered in ProSoma to measure CC, left-right (LR) and anterior-posterior (AP) displacements. Influence of the heart displacement on dosimetry was measured by superimposing the contoured heart volume of the second scan onto the treatment planning CT scan and calculating mean heart dose.

Results: Results of the tape test show a mean CC displacement of 3.3 mm (range 0.5-8.0 mm) for the midclavicular region. For the two breath hold CT scans mean CC clavicle displacement was 1.1 mm (range 0.1 - 2.8 mm). The measured CC displacements of the tape test were for all 19 locoregional patients larger than measured with CT.

Mean difference in contoured heart volume was 3.7% (range 0.5 - 11.2%). Mean heart dose differed on average 0.12 Gy (range 0.01 - 0.38 Gy), where planned mean heart dose varied between 0.59 and 3.58 Gy. Mean heart displacement was 1.7 mm (range 0-4.7 mm) CC, 1.5 mm (range 0.1-4.2 mm) AP and 1.9 mm (range 0.1-6.9 mm) LR.

Conclusion: A simple visual test is a good surrogate for CT scans in analyzing vmDIBH reproducibility. We showed that vmDIBH is reproducible with minimal gap or overlap between

Reproducibility breath hold

Conclusion: A simple visual test is a good surrogate for CT scans in analyzing vmDIBH reproducibility. We showed that vmDIBH is reproducible with minimal gap or overlap between
the tangential and supraclavicular fields, allowing for implementation of vmDIBH in locoregionally irradiated patients. Heart position variation is limited to 2 mm and dose variation to 0.4 Gy, between sequential breath holds for most patients.

OC-0169
Patient information through group sessions to improve knowledge regarding breast cancer radiotherapy
M.T.A. Tinggaard Axelsen1, M.J. Jensen1, B.H. Haislund2, H.M.N. Melgaard Nielsen1
1Aarhus University Hospital, Department of Oncology, Herning, Denmark
2Aarhus University Hospital, Department of Oncology -

Purpose or Objective: To inform early breast cancer patients about postlumpectomy radiotherapy (RT) in group session, and to evaluate their knowledge regarding side-effects and precautions compared with patients informed by doctors.

Material and Methods: From April 2015 to June 2015, patients referred for RT at a single institution were informed about RT during one hour group sessions (pilot group). These were held twice a month with up to six patients and their relatives. The patients and relatives were informed about RT preparation procedures, structure of the linac and beams effect, side effects, precautions and lifestyle recommendations during and after RT, by radiation therapists, using power-point presentations. After these group sessions, the patients had a 30 min individual consultation including an examination by a doctor. The patient’s knowledge regarding side-effects and precautions were evaluated using a questionnaire that they anonymously were asked to answer in connection with the following planning CT scan. The same questionnaire was filled in by patients before April 2015 (control group), thereby being able to compare knowledge of side-effects and precautions during RT among patients informed during group sessions compared with patients informed by doctors. The two groups were compared using chi-square statistics.

Results: 33 patients filled in the questionnaire after conventional information and 25 patients after group sessions. The following subjects were more often correctly answered by patients informed during group sessions: Acute toxicity (p< 0.001), sequence of acute events (p=0.16), precautions during RT (p=0.006), late toxicity (p=0.07), reasons for recommendation of non smoking (p=0.03) and use of skin care cream (0.002). The group sessions were timesaving for both the radiation therapists and the doctors and especially for left sided patients, information about respiratory gated RT resulted in reduced scheduled time for information. The patients were generally satisfied e.g. one said “I wish I was informed that way the last time I was given RT”. Participating patients were able to create personal relations to other participating patients. The radiation therapists were in general content and satisfied by the challenge of being responsible for RT information to these patients.

Conclusion: Patient’s contentment and level of knowledge before initiating RT can be improved by educating and preparing the patients for RT during group sessions. These group sessions are now implemented as standard information procedure for all breast cancer patients, and it is considered to expand these sessions to other groups of cancer patients.

OC-0170
Detection of setup errors with body surface laser scanning system for whole breast irradiation
P. Jiang1, Z. Liu1, J. Wang1, S. Zhou1, J. Li1, H. Sun1, S. Jiang1
1Peking University Third Hospital, Radiation Oncology department, Beijing, China

Purpose or Objective: To investigate the clinical application of a technique for patient set-up verification in whole breast irradiation after conservative surgery based on a surface laser scanning registration system

Material and Methods: Displacements from concurrent Sentinel™ (Sentinel®, C-Rad Positioning AB, Sweden) surface imaging and Elekta Axesse accelerator cone beam CT (CBCT) registrations were compared for 10 patients with breast cancer after conservative surgery for a total of 130 set-ups. As comparison, the patient outline extracted from the planning CT system (Oncentra®, nucletron/Elekta, Sweden) was used as Sentinel™ reference (Ctref) and also was used as a reference for the CBCT method. Patients were first scanned both with surface laser scanning and CBCT, shifted to the optimal isocenter position according to CBCT verification. And then another optical scan was performed to verify the matching in relation to CBCT. Position detection by both surface scan and CBCT acquired for the first five fractions of radiotherapy and then twice weekly. The data collected by both systems were statistical analyzed by paired t-test using SPSS 13.0.

Results: The absolute translational setup errors (mean ± SD) in X (Lateral), Y (Longitudinal), Z(Vertical) axes detected by CBCT prior radiation were 0.21±0.21cm, 0.29±0.26cm and 0.42±0.22cm respectively; rotational setup errors (mean ± SD) in Rx(Pitch), Ry(Roll), Rz(Yaw) axes were 0.83±0.7, 1.12±0.79 and 1.07±0.81. The absolute translational setup errors (mean ± SD) in six directions detected by Sentinel™ prior radiation were 0.14±0.18cm, 0.15±0.14, 0.13±0.13, 0.77±0.54, 0.76±0.61 and 1.23±0.95. The system accuracy was better than 1.5 mm and 1.1° when a Sentinel™ image was used as reference. Paired setup errors form Sentinel™ and CBCT showed no significant difference in five directions: X (t=1.827, P=0.07), Y (t=0.125, P=0.9), Z (t=1.595, P=0.112), Ry(t=–1.717, P=0.09) and Rz(t=2.382, P=0.6) axes, and significant difference in one direction of Rx(t=3.409, P=0.03) axes.