Still be able to achieve 100% reduction, DIBH amplitudes of 1-5cm reduce cardiac mean dose by at least 50%.

PO-1004
Optimising breast dosimetry: improving homogeneity through the application of angled IMRT fields
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Purpose or Objective: Studies have demonstrated significant side effects associated with dose inhomogeneity and low dose integral splay. Several techniques seek to maximise dose uniformity whilst minimising regions of low dose. The angled segment technique offers two additional options, each allowing for control over homogeneity (HI) and low dose conformity (CI).

Material and Methods: Tangent fields of twenty previously optimised plans were copied. Two re-optimisation methods were applied. Firstly, a single medially angled off-inversely planned (I-IMRT) beam was appended to the existing beamset. The plans were further optimised and normalised (PTV V47.5 = 99.00%). Secondly, an additional acutely laterally angled I-IMRT beam was added, reoptimised, and normalised.

Results: The addition of the single I-IMRT beam resulted in a statistically similar average absolute maximum dose (Dmax 54.55Gy vs. 54.71Gy, p=0.33) but a markedly reduced V100% (14.71cc vs. 23.17cc, p=0.01). Low dose (V1) integral splay was maintained (6410.04cc vs. 6402.45cc, p=0.44), but was reduced marginally contralaterally (V1 splay over midline 6.60cm vs. 6.80cm, p=0.04). Dose to the ipsilateral lung was slightly reduced (5.23Gy vs. 5.33Gy, p=0.04). The additional dual angled off I-IMRT fields reduced the average maximum dose (Dmax 53.79Gy vs. 54.71Gy, p=0.03) and the V100% size substantially (1.90cc vs. 23.17cc, p=0.01). Homogeneity was improved (HI= 0.11 vs. 0.13, p=0.03), whilst the ipsilateral mean lung dose was unaffected (5.33Gy vs. 5.33Gy, p=0.48). The volume of the low dose (V1) integral splay increased by an average of 1.5% (6501.14cc vs. 6402.45cc, p=0.04), and appeared further contralaterally (8.40cm vs. 6.80cm over midline, p=0.02).

Conclusion: The application of additional acutely angled fields provides scope to reduce regions of high dose and improve breast homogeneity while controlling integral dose splay.

PO-1005
Dosimetric effect of US versus CT delineation on postplanning I-125 treatment
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Purpose or Objective: Since 2000 we have been treating low- and intermediate-risk prostate cancer patients with permanent Iodine-125 implants. After 6 weeks postimplantation dosimetry (PID) was performed using the Pro-Qura technique (Allen et al, 2008). In a previously performed study in our institute (cohort of 394 patients), we found that the dosimetric quantifier V100 was not correlated with biochemical relapse. Therefore, we examined the PID method to obtain more detailed information on the quality of the PID parameters. From the literature it appeared that in PID many uncertainties affect the quantifiers: delineation, source identification and imaging modalities (De Brabandere et al, 2012). In 2014 we started working with an automated seed reconstruction system (Elekta) to eliminate uncertainties in source identification. However, the other uncertainties still remained. Furthermore, the cranio-caudally length of the Ultrasound (US) prostate contour was distally more extended compared to the contour on the postplan CT-scan. This could be explained by the deformation of prostate by the US probe. The main purpose of this study was to determine the differences in PID based on US- or CT-contours.

Material and Methods: For 71 patients in supine position an axial CT-scan (1 mm slice thickness) was made of the prostate. One radiation therapist (RTT) performed the PID using the US prostate contour fused with the postplan CT-scan. The apex area was defined as the volume derived from a quarter of the base-apex distance. We analyzed the V100 of the apex area and selected the patients with a coverage of less than 67%. Thereafter, we randomly selected 2 groups of patients: Group A: 5 patients with an optimal postplan implantation in the apex area conform Pro-Qura. Group B: 5 patients with an inferior implantation result in the apex area, a coverage of less than 67%. For each patient, one radiation oncologist delineated the prostate on the CT-scan, trying to ignore the seeds. With that new delineated prostate the RTT performed a PID and these CT-based results were compared to the original results. To see the difference in length of the prostate on both modalities, we defined the last slice of the visible apex on both US and CT.

Results: Between the US- and CT-scan volume an absolute difference was found of 12% (SD 2%). In both groups we found, in four out of five patients, that the apex on CT was positioned less caudally compared to the US-scan, figure. This was 4 and 10mm for group A and B respectively.

PO-1006
A breath-hold friendly, hybrid 3DCRT/IMRT technique for locoregional breast irradiation
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Purpose or Objective: IMRT optimises not only the planned dose, but also the clinical preparation and treatment delivery. Until recently, our hospital used a standard 3DCRT for the breast, thoracic wall and lymph nodes ranging from level I to IV, including the parasternum. This usually leads to inconsistent OAR sparing, PTV coverage and conformity, abutting region from multiple fields and long treatment times due to many, high-MU fields. The objective of this study was to develop a hybrid 3DCRT/IMRT technique for locoregional breast irradiation, which is also “breath-hold friendly” i.e. fewer MUs and fields. This technique should optimise planning and treatment times, maintain or reduce dose to OAR, improve PTV homogeneity, avoid the use of wedges and minimise the number of abutting beams.