Materials and Methods: One left-sided breast cancer patient treated with adjuvant radiotherapy after a breast-conserving operation in November 2012 was chosen randomly. The patient was scanned with 2.5 mm slice thickness without contrast. Oncentra® External Beam v3.3 (Nucletron, An Elekta Company) was used for delineation and planning (collapsed cone algorithm). The individual delineations (IDs) of the CTV, heart and LADCA were performed by six experienced radiographers and one experienced radiation oncologist according to our written clinical guidelines. Finally, two experienced radiographers and two radiation oncologists agreed on consensus delineation (CD) of all three volumes. The dice similarity coefficient (DSC) was used to evaluate the overlap accuracy between the CTV and the heart for each ID using the CD as a reference. Treatment plans for each of the seven IDs and the CD were optimised according to the clinical guidelines by one radiographer. The volume of the CTV receiving 95% of the prescribed dose (50 Gy/25 fractions) or higher (V95) and dose to heart and LADCA from each treatment plan were found for the CD structures.

Results: The volumes of the CD CTV and heart were 664.5 cm³ and 550.8 cm³, respectively. For the seven IDs the median value for the CTV and heart were 672.1 cm³ (range 641.4 – 692.5 cm³) and 546.7 cm³ (539.9 – 561.5 cm³), respectively. Median values of DSC for the CTV and heart were 0.96 (0.94 – 0.98) and 0.97 (0.95 – 0.98), respectively. All ID structures were delineated in the same slices as the CD ± one slice except for one LADCA delineation that differed by two slices. Delineations in one slice are shown in Figure 1. For the seven treatment plans, the median V95 for the ID CTVs was 97.8% (97.1 – 98.0%). Evaluation of dose to CTV as defined on the CD from each of the seven treatment plans resulted in a median V95 of 97.9% (97.8 – 98.0%). Dose constraints for the heart (V20<10%, V50<5%) and LADCA (Dmax<20 Gy) were not violated in any of the seven treatment plans.

Conclusions: The results of DSC for the delineated CTV and OARs for a left sided breast cancer patient show only a slight variation in delineation. No clinical relevant differences in delineation of CTV were seen between radiographers and the oncologist when using the same clinical guidelines. This is believed to be due to the precisely described guidelines and education. Furthermore the small variations in delineations is believed to have no clinical influence on the treatments as seen from the very small differences in dose coverage for the CD CTV as well as the dose to the CD OARs in the treatment plans based on the IDs.

Figure 1. Delineations of CTVs, heart and LADCA: black consensus delineation, white: individual delineations.

EP-1045
Quality of life and cosmetic results in breast cancer patients after whole breast or partial breast irradiation
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Purpose/Objective: In early breast cancer patients conservative therapy followed by whole breast radiotherapy (WBI) offers a good quality of life (QoL). Although partial breast irradiation (PBI) is increasingly used as an alternative to WBI in selected groups of patients, its impact on QoL has not been extensively studied. This study assessed patients’ QoL after PBI with high-dose rate interstitial brachytherapy (BRT) compared with WBI.

Materials and Methods: QoL was evaluated in 39 PBI patients, enrolled in a phase II prospective study (32 Gy in two daily fractions over 4 days) and in 78 matched WBI controls (50 Gy standard fractionation ± 10 Gy boost). Ten-item self-administered close-ended questionnaire, exploring body image, fear of recurrence, satisfaction with treatment and cosmetic results, was administered twice during follow-up at a mean of 20 and 80 months after treatment. Italian version of questionnaire was asseverated. Physicians’ and patients’ cosmetic assessment was done. Chemotherapy and hormonal therapy effect on cosmetics was analysed. The Mann-Whitney test and Wilcoxon test compared the results. The X² test was used for categorical data. For concordance between judgements was used Cohen’s k-test of inter-rater agreement. Strength of agreement was interpreted according to the Landis and Koch’s gradation. P <0.05 was considered significant.

Results: The two groups were well matched, except higher chemotherapy-treated patients in WBI group (41% vs 15%, p <0.004). At first analysis no significant difference emerged on body image and fear of recurrence scales. PBI patients were more satisfied with treatment (p=0.019) and cosmetic outcome (p=0.0001). Second analysis included 96 patients, 33 in the PBI group, 63 in the WBI group. No significant differences were found on body image or fear of recurrence scales. Cosmetic outcome was better in PBI group (p=0.002). Results from the first and the second analysis were compared into each treatment group. Body image scale was significantly better at the second analysis in both groups (p=0.001 for PBI; p=0.0001 for WBI). Fear of recurrence scale was unchanged. No differences were found in cosmetic outcome as assessed by patients. In the first analysis physicians assessed cosmetic outcome as significantly better in PBI group (p=0.0001) and confirmed it at second analysis. Physicians’ and patients’ opinions on cosmetics diverged (k = 0.148 at 2 years, 0.023 at 5 years) with physicians judging outcomes better than patients. Adjuvant chemotherapy had no impact on of cosmetics in either group according to physicians and patients assessments.

Conclusions: Even at longer follow-up, QoL is similar after BRT PBI or WBI in terms of body image, fear of recurrence and satisfaction with treatment; PBI provides a significantly better cosmetic outcome.
Conclusions: According to ICRU 83 report, to correctly evaluate PTV volumes extended outside the body surface, several methods have been proposed, for example by extending the beam intensity values from the breast periphery to the regions outside the body. By attributing a density value to PTV-SQG we were able to achieve this same goal even without the use of any inverse IMRT tools.

**EP-1047**

**Purpose/Objective:** Different techniques of accelerated partial breast irradiation have been described in the literature. Using a volumetric modulated arc therapy technique (VMAT) allow a better target coverage and better protection of critical organs compared to three-dimensional conformal radiotherapy (3DCRT). We present here the dosimetric results of the first patients treated with CRLC Val dAurelle in Montpellier for an accelerated treatment (IPAS).

**Materials and Methods:** Between may 2011 and July 2012, ten patients were treated by IPAS for breast cancer using a VMAT technique. Dose was 40 Gy, 4 Gy per fraction twice per day in Montpellier for an accelerated treatment (IPAS).

**Results:** The average volume of the PTV was 99.9 cc [39.8 to 219.5] (mean and range). An average of 95% of the PTV received 99.7% of the prescribed dose [99.4 to 99.9]. Hotspots: V<sub>100</sub> uncovered represented 0.34% [0 to 1.42] PTV. The homogeneity index defined as: HI = (D<sub>2</sub> - D<sub>98</sub>) / D median was 0.056 [0.040 to 0.065]. The dose to healthy tissues (OAR) was optimal. For the ipsilateral lung V<sub>20Gy</sub> was 0.27% [0 to 2.67]. The V<sub>5Gy</sub> was 1.60% [0 to 10.47]. 6.17% V<sub>5Gy</sub> [0 to 19.94]. Regarding the contralateral lung V<sub>20Gy</sub> and V<sub>5Gy</sub> are equal to 0% and V<sub>5Gy</sub> < 0.28% [0 to 2.78]. For the heart V<sub>5Gy</sub> was 3.10% [0 to 23.59], all other constraints were largely reached. The average number of monitor unit was issued 580UM [473-655] and the processing time was 3.2 minutes for two arcs.

**Conclusions:** IPAS by Rapidarc provides excellent coverage of the PTV while preserving healthy tissues. Processing speed improves its quality because intrafractions movements are reduced. We have not observed severe acute toxicities.

**EP-1048**

**Purpose/Objective:** To evaluate compliance of patients with carcinoma breast to cancer directed therapy in multidisciplinary cancer care setting.

**Materials and Methods:** The study included a total of 117 patients. Patients were assessed as per patient, disease, & treatment related factors. Surgery included modified radical mastectomy or breast conservation surgery. Chemotherapy comprised of 6 cycles of FEC or 4 FEC/4Docetaxel in neoadjuvant & adjuvant setting respectively. Hormon therapy was offered to patients with HER/neu overexpression. Radiation therapy delivered was 50 Gy/25/5 wks, a boost of 16Gy/8/1.5 wks was delivered to the lumpectomy cavity for patients undergoing BCS. All patients were considered for tamoxifen/ aromatase inhibitors depending upon receptor & menopausal status. For the purpose of study compliance was defined as all patients who were able to complete the stipulated treatment (excluding the hormone therapy) as intended at the primary multidisciplinary clinic. The key factors evaluated for compliance and overall treatment time were date of initiation of cancer directed therapy, surgery date, chemotherapy initiation & completion dates, radiation start & completion date. Overall treatment time was calculated from the day of initiation of cancer directed therapy to completion of therapy (before the initiation of hormone therapy).

**Results:** Seventy percent of the patients presented in loco-regionally advanced disease. Most of the patients (66%) were between 40-69 years of age group. Receptor status positivity for Estrogen and progesterone receptor were 43% & 36 % respectively whereas Her-2/neu was over-expressed in 36% of the patients. Eighty nine percent of the patients were subjected to curative therapy whereas 11% of the patients were subjected to palliative treatment. Modified radical mastectomy was performed in 72% of the patients whereas only 14% of the patients underwent breast conservation therapy. Neoadjuvant chemotherapy was administered in 51% of the patients while 34% of the patients received adjuvant chemotherapy. Sixty eight per cent of the patients received 50Gy/25R/5 wks whereas 14% received further lumpectomy boost. Eighty six per cent of the patients were compliant to cancer directed therapy. The overall median treatment time was 262 (92-335) days.

**Conclusions:** Eight six per cent of the patients were compliant to cancer directed therapy whereas fourteen per cent of the patients failed to comply to the stipulated treatment before the initiation of hormonal therapy. For compliant patients the median overall treatment time was 262 days.

**EP-1049**

**Purpose/Objective:** Although electronic health records are currently more common place, not all the information can be used in automatic processes, mainly due to the use of free text structured to abstract certain values in a table related to the health records. The objective of this study is to test a simple natural language processor (NLP) for automatic identification of tumor size from the pathology report (PR) before adjuvant radiotherapy for breast cancer (BC).

**Materials and Methods:** Consecutive PRs were identified by searching a database of BC patients treated with surgery and adjuvant radiation therapy between January - April 2012. The inclusion criteria included: (1) patients having an unstructured free-text PR; (2) non-metastatic BC; (3) non simultaneous contralateral BC. Our approach starts with the detection and extraction of the tumor's size characteristics in unstructured free text from an electronic health record source (PR) using a simple NLP. Secondly, based on the data extracted, we applied different classification trees from the java data-mining open source software: weka. Three data mining algorithms were used: J48 based on C4.5 algorithm, LADtree, and NaiveBayes. A classification algorithm not based on data-mining was also applied. The PRs were reviewed and annotated by a 3rd year radiation oncology resident according to the 7th edition TNM staging system. Finally, an expert senior radiation oncologist revised the divergent classification results found between the resident and the different algorithms.

**Results:** A total of 68 PRs (test set) met the inclusion criteria. The pathological tumor size classification is shown (Table). The median PR length was 88 words (range, 69-244). Compared to human classification (resident), the coincidence rates with the non-data mining based algorithm and the J48, LADtree, and NaiveBayes algorithms were 86%, 83%, 82%, and 77%, respectively. After the expert revision, the coincidence rates between algorithms and human classification were: 96%, 93%, 87%, and 82%, respectively. There were only 3 errors when using the non-based on data mining algorithm, being 5, 9 and 12 when using J48, LADtree, and NaiveBayes algorithms, respectively. The errors in the classification by the algorithms were mainly due to two reasons: (i) lack of recognition of multiplicity status and inflammatory disease. The resident’s classification errors mostly resulted from use of the clinical T stage when the PR revealed a complete response after neoadjuvant chemotherapy.