and using the same patient anatomy and fractionation schedule virtual plans for intensity modulated radiotherapy (IMRT) were made. The PTV in IMRT plans was created by 5 mm volumetric extension around the PTV used in BT plans. PTV_EVAL was formed from PTV with geometrical limitation to the skin. Detailed dose-volume histogram analysis was carried out for the PTVs, breasts, lungs, skin, ribs and heart. Means, standard deviations were calculated and the corresponding parameters were statistically compared. Wilcoxon matched pairs analysis was performed for test of significance.

Results: The target coverage represented by V90 was better for IMRT (100% vs. 97%, p<0.05), but the D90 was higher for BT (103% vs. 100%, p<0.05). The conformity numbers were 0.73 for BT and 0.84 for IMRT (p<0.05). The V100, V90 and V50 for non-target breast were 1.7% vs. 0.2% (p<0.05), 2.8% vs. 4.3% (p<0.05) and 11.5% vs. 23.9% (p<0.05) for BT and IMRT plans, respectively. For ipsilateral lung the V5 was not significantly different in the two groups, but the V10 was lower for BT (11.7% vs. 20.5%, p<0.05). For contralateral breast and lung no significant differences in D0.1ccm were observed. For patients with left sided lesion the dose to heart was less with IMRT for D0.1ccm (15.3% vs. 22.7%, p<0.05). The most exposed skin volume (0.1 ccm) received significantly less dose with BT (64.4% vs. 92.4%). The same is true for ribs with values of 51.3% vs. 71.2%. With BT the ribs never received the prescribed dose, while with IMRT the D0.1ccm exceeded the prescribed dose in five cases.

Conclusion: With both BT and IMRT techniques acceptable target coverage can be obtained, but the conformity of dose distributions is better with IMRT. The dose to organs at risk is less with BT compared to IMRT, except for the heart. Generally, the BT and IMRT can be alternative techniques for partial breast irradiation, but in individual cases the recommended technique depends on the tumour location.

EP-1958 Treatment results of Mammosite catheter in combination with whole breast irradiation
A. Gitt1, H. Böse-Ribeiro1, C. Nieder1, P.G. Kup1, H. Hermann1, H. Bühler1, H.Y. Ergonenc1, D. Druppell1, I.A. Adamietz1, M. Fakhrian2
1Marien Hospital Herne, Ruhr-University Bochum, Radiation Oncology, Herne, Germany
2Nordland Hospital Bodø, Department of Oncology and Palliative Medicine, Bodø, Norway
3St. Anna Hospital Herne, Department of Semology, Herne, Germany

Purpose or Objective: To report the initial outcomes of patients treated with the MamoSite brachytherapy device (MSBT) as a boost followed by whole breast irradiation (WBI).

Material and Methods: From June 2011 to March 2014, 107 patients (typically pT1a, pN0-1, M0) were treated with breast-conserving therapy (BCT) and adjuvant radiotherapy with MSBT (15 Gy in 2.5 Gy fractions) followed by WBI (median 50.4 Gy). Toxicity was classified according to the Common Terminology Criteria for Adverse Events v3.0. The median follow-up was 21 months.

Results: So far no ipsilateral breast-tumor recurrences were observed, 102 patients (95%) were alive at last follow-up. Two patients (2%) developed distant metastasis. Five patients (5%) died during follow-up, only one as a result of breast cancer. The 2-year disease-free survival was 95 ± 3%. The incidence of asymptomatic and symptomatic seroma in 90 days after MSBT was 28% and 10%, respectively. Infectious mastitis was observed in 3 patients (3%), who were treated successfully with antibiotics. Only 3 patients (3%) developed a radiodermatitis > grade 2 after WBI.

Conclusion: The boost technique used in this study seems to provide excellent local control with acceptable toxicity, similar to the results observed with other forms of interstitial accelerated partial-breast irradiation as a boost. Long-term follow-up is necessary to refine the patient selection criteria and to assess efficacy and late toxicities.

EP-1959 Dosimetric consequences from minimal displacements in APBI brachytherapy using the SAVI applicator
S. Pella1, C. Sherreen1, D. Niculai1, H. Mikko1, P. Janeit1
1Florida Atlantic University, Physics-Medical Physics Graduate Program, Boca Raton, USA
2Florida Atlantic University, Physics, Boca Raton, USA
3Florida Atlantic University, Physics, Boca Raton, USA

Purpose or Objective: Evaluate the necessity of a complete CT scan before each treatment in the APBI and the use of additional immobilization devices.

Material and Methods: A retrospective study was performed on 25 patients treated in the 2013-2015 period with APBI brachytherapy. The CT scans of each patient taken before each treatment were imported in to the planning system. Each CT scan was registered with the initial one. Dosimetric evaluations respective to the initial CT scan image series were performed. The deviation of dose received by the skin and ribs in each treatment were calculated and minimum, maximum and average dose received by skin and ribs were recorded and compared to the initial plan’s results.

Results: Small deviations in displacements were observed from the SAVI applicator to the ribs and the skin surface. Dosimetric evaluations revealed, very small changes in the inter-fractionation position make significant differences in the maximum dose to these critical organs. As a result, the maximum dose varied between 10% and 32% in ribs and skin surface.

Conclusion: The CT scan before each treatment is necessary to minimize the uncertainty in setup and any intervention if deemed necessary. This study indicates, in 30% of the cases needed re-planning between treatments to minimize the risk of critical organs to be overdosed. We conclude that the physicist should evaluate the position of the device by analyzing the CT images before each treatment and consider re-planning if the deviations are high. Also this study reveals the urgent need of improving the immobilization methods when treating APBI with SAVI applicator. This type of treatment will benefit of deformable registration at each treatment and adaptive planning.
status performed in 72 (75%) pts. median 4 (0-40) in other 24 (25%) Nx; diameter of the cylinder used in 76 (84%) pts. was 3-4 cm remaining 20 (26%) diameter 1-2. Only 3 (3%) pts resulted disease progression. Psychological evaluation was performed on 69 pts (Median age 61; 44 - 71), the other 27 could not be estimated because not interested. In the first area test showed for a third of pts a change of social relations judged value "from much up to very much", 71% of women surveyed had been recommended to have therapeutic relationships, 73% of respondents reported painful intercourse and 91% of pts found it unsatisfactory. 13% of pts has explicitly requested psychological support

Conclusion: Apart from grading and lymph node status, BRT of vaginal cuff is effective in preventing local recurrence. Despite of use of larger diameter cylinders, remains problem of toxicity management post BRT. Analysis of impact on psychological evaluation was performed using 4 fractions of 7 Gy in 45 patients (95.7%) and ovoids high-dose rate tridimensional (HDR 3D BT) brachytherapy for HDR 3D BT of 47 cases of gynecological cancer (46 cervical and 1 endometrial cancer) were studied. The perforation rate (PR) was determined by software Oncentra MasterPlan V3.3 (Veenendaal, Netherlands). The categorical variables tested were: bladder filling (empty vs. full), age (≥60 years vs. >60 years), uterine lateral position (left or right vs. central) and uterine sagittal position (anterior vs central or retrograde). For statistical analysis, multiple logistic regression was performed (SPSS V.20).

Results: The study evaluated 186 insertions. The treatment was performed using 4 fractions of 7 Gy in 45 patients (95.7%) and 3 fractions of 7 Gy in two patients (4.3%). Median age was 47 years (range, 24 - 82). The total PR was 21.5% (40 events). The route of the perforation was: 67.5% posterior wall (27 cases), 17.5% left lateral (7 cases), 7.5% cranial (3 cases), 5% anterior wall (2 cases) and 2.5% right lateral (1 case). In forty-three cases (91.5%), the perforation occurred in the opposite direction of the uterus anatomic position. Factors that increased the PR in univariate analysis were: empty bladder (p=0.001), anterior uterine position (p=0.010) and age (p=0.010). In multivariate analysis, only empty bladder remained as an independent prognostic factor for perforation (p=0.002).

Conclusion: In our series, the modifiable factor empty bladder correlated with uterine perforation. Although uterine anatomic position did not influenced significantly the incidence of uterine perforation, it determined the direction of the perforation in more than 90% of the cases. Our data suggest a potential value of image guidance for brachytherapy insertion.

Purpose or Objective: To compare CT-based dose distribution to CTV and organs at risk (OAR) of HDR vaginal vault brachytherapy (VVB) with stump applicator according to 2 prescription modes: standard prescription to 5 mm from the applicator and individualised prescription according to the thickness of the vaginal wall.

Material and Methods: This study was performed between January 2013 and December 2014, on a cohort of 61 consecutive patients (pts) with endometrial cancer referred for a post operative HDR VVB. Mean age was 68 years. According to FIGO stage, 21% were Ia G3, 54% Ib, 10% II and 15% III. 24 Gy in 4 fractions were delivered as sole treatment in 33 pts; whereas 28 pts received 10 Gy in 2 fractions after 45 Gy pelvic irradiation. The CT was performed with applicator in situ before the first fraction. The size of the applicator was determined according to the clinical examination, but was modified if significant air gaps were observed on CT. CTV was defined as the vaginal vault and the upper third of the vagina; intestine as the lower third of the peritoneal cavity. Bladder and rectum were delineated entirely. Using brachyvision®, the Standard Plan (SP) was calculated for delivering the fraction dose (FD) on a reference line placed at 5 mm of the applicator surface irrespective of the location of OAR. The Individualised Plan (IP) was calculated from a line that conformed to the outer contour of the CTV with the following constraints: CTV90 = FD+/−5%, D2cc to rectum and bladderFD and D2cc to Intestine ≤ (FD-1Gy). The CTV90 and D2cc to OAR were used for the plans comparison.

Results: According to constraints (in, above, under), 6 different groups could be defined: Gp1 : D90 and D2cc in; Gp2 : D90 in and D2 cc above; Gp3 D90 and D2cc above; Gp4 : D90 above and D2cc in ; Gp5 D90 under and D2cc in ; Gp9 D90 under and D2cc above. Results of the comparison are summarised in the following table.

Conclusion: CT-based individualised single source line HDR VVB was feasible and resulted in optimisation of the dose distribution to CTV and/or OAR in the majority of cases. In only 20% of cases, individualisation didn’t change the dose distribution. Consequently, CT-based dosimetry became the standard procedure in our department since January 2015. The assessment of the clinical impact will be the next step.

Purpose or Objective: The aim of the study is to evaluate the differences in dosimetry between tandem-ovoid and tandem-ring gynaecologic brachytherapy applicators in image guided brachytherapy.