cosmetic outcome was good/excellent in 94% of patients. At one year skin toxicity was G1 in 13% of patients, 1 patient G2, 1 patient G3; cosmetic outcome was good/excellent in 93% of patients. After an early evaluation of clinical outcomes we have found 12 cases of progression disease, only one patient had an In-Breast-Recurrence.

Conclusion: The 3-week course of postoperative radiation using VMAT with SIB was well tolerated in acute and early late settings. Long-term follow-up data are needed to assess late toxicity and clinical outcomes.

### PV-0512

**Accelerated partial breast irradiation for Luminal-A breast cancer: analysis from a phase 3 trial**

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**Purpose or Objective:** Breast cancer (BC) could be classified into four major molecular subtypes: Luminal-A, Luminal-B, triple negative/basal-like, human epidermal growth factor 2 (HER2) enriched. This classification could be based on immunohistochemistry, and may allow the clinicians to optimize treatment management. Luminal-A tumors represent around 40% of BC and are characterized by: estrogen receptor (ER) and/or progesterone receptor (PgR) positive, HER2/neu negative, and low Ki-67 proliferative index. Early Luminal-A tumors tend to have an excellent prognosis, with high survival and low recurrence rates. The aim of this analysis was to observe Luminal-A outcome from a phase 3 trial comparing whole-breast irradiation (WBI) to accelerated partial breast irradiation (APBI) using intensity-modulated radiotherapy (IMRT) technique.

**Material and Methods:** In the whole trial 520 patients were randomized in 1:1 ratio to receive APBI versus WBI after breast conserving surgery for early BC. The primary endpoint was occurrence of ipsilateral breast tumor recurrence (IBTR); the main analysis was by intention-to-treat. This trial was registered with ClinicalTrials.gov, number NCT02104895.

**Results:** Luminal-A patients represented the 61.5% of the whole series (151 WBI versus 169 APBI). 5-year event rate according to allocated group showed no statistical difference in terms of IBTR (p=0.53). One case (0.9%) versus two cases (1.7%) were observed in the WBI and APBI arms, respectively. Survival events occurrences and IBTR curve are summarized in the Figures.

<table>
<thead>
<tr>
<th>Event</th>
<th>Total</th>
<th>WBI (n=151)</th>
<th>APBI (n=169)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBTR</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Local recurrence</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>New ipsilateral BC</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Locoregional recurrence</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Distant metastases</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*p-value from log rank test*

**Conclusion:** We observed a very low 5-year rate of IBTR for Luminal-A patients treated with APBI. Although these results should be confirmed at a longer follow up time, this approach should be considered for this subset of early BC patients.

### PV-0513

**The impact of chemotherapy on toxicity in the era of hypofractionated radiotherapy**

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**Purpose or Objective:** To evaluate toxicity in breast cancer patients treated with anthracycline and taxane based chemotherapy and whole breast hypofractionated radiotherapy, and to identify the risk factors for toxicity.

**Material and Methods:** From April 2009 to December 2014, 540 patients received radiotherapy after breast conservative surgery (BCS). The dose was 42.4 Gy in 16 daily fractions, 2.65 Gy per fraction. The boost to the tumor bed was administered only in grade 3 patients and in patients with close or positive margins. Acute and late toxicity were prospectively assessed during and after radiotherapy according to RTOG scale. The impact of patients clinical characteristics and dose inhomogeneities on the occurrence of an higher level of toxicity has been also evaluated by univariate and multivariate analysis.

**Results:** One hundred and nineteen patients received chemotherapy. Sixty-one patients (11.3%) underwent trastuzumab therapy and four hundred and forty-one (81.6%) hormonotherapy. The mean age was 74 (range 46-91 yrs). Forty seven (8.7%) and two hundred fifty eight (47.5%) patients were affected by diabetes mellitus and hypertension, respectively. G1 and G2/G3 acute skin toxicity were 53.7% and 28.5% in patients received chemotherapy and 63.2% and 18.5% in patients who did not receive it, respectively. No significant difference (p=0.092) was find
between the two groups of treatment. The boost administration (p< 0.01), the breast volume (p 0.04), dose inhomogeneities (p<0.01) and boost volume (0.04) were found to be statistically significant as concerns the occurrence of acute skin reaction at the univariate analysis; the boost administration (p< 0.01), and hormone therapy (p 0.01) at multivariate analysis. Other clinical factors such as diabetes or hypertension were not correlated with the development of acute skin reaction. G1 and G2/G3 late fibrosis were 15.3% and 8.1% in patients received chemotherapy and 12.3% and 3.1% in patients who did not receive it, with a significant difference (p=0.045) between the two groups. Diabetes (p 0.04) and boost administration (p <0.01) were also found to be statistically significant on the occurrence of late fibrosis, but a multivariate analysis adjusted also for clinical tumour characteristics did not show any factors correlated to late fibrosis.

Conclusion: The results of our study, according to the large randomized trials, confirmed that hypofractionated whole breast irradiation is safe, even in patients treated with chemotherapy. Chemotherapy didn’t impact on acute toxicity but only on late toxicity; however the percentage of G2-G3 fibrosis is low (8.1 vs 3.1%). Our study confirmed an increase of acute and late toxicity in patients who received additional boost.

Purpose or Objective: The effect of radiotherapy (RT) on the outcome of autologous reconstruction after mastectomy for breast cancer is unclear. Advances in technique such as the deep inferior epigastric artery perforator (DIEP) flap and IMRT may affect the complication rate. We seek to retrospectively evaluate the outcomes after flap reconstruction at our institution with a focus on radiotherapy variables.

Material and Methods: Patients receiving flap reconstruction after mastectomy at our institution from 2003-2014 were identified in a chart review. Analysis was limited to patients with a coded cancer status and who returned for at least one follow up visit. The outcome variables analyzed were flap loss or any complication (loss, ischemia, hematoma, infection). Descriptive data analyzed included age, tumor stage, flap type, chemotherapy, and radiation. RT specific variables included radiation at an academic medical center vs independent radiotherapy facility, 3D-CRT vs IMRT, and whether radiation was directed to the internal mammary (IM) region. Analyses was on a per-flap basis rather than per patient. Statistics were done in SPSS using logistic regression. Two prognostic models were generated. The first included all patients and analyzed age, stage, flap type, chemotherapy, and radiation therapy. The second model included only those receiving radiation therapy and included significant factors from the first model and the RT variables discussed above.

Results: 291 patients receiving 402 flap procedures met inclusion criteria. Mean age was 47.2 years with median follow up of 339 days. 93 (21.2%) had transverse rectus abdominis (TRAM) flaps, 178 (40.6%) had muscle sparing TRAM flaps, and 121 (27.6%) had DIEP flaps. 128 (29.2%) flaps were done after mastectomy for benign histology; 62 (14.2%) were for DCIS/ LCIS, 69 (15.8%) were for stage I, 88 (20.1%) were for stage II, 52 (11.9%) were for stage III, and 3 (0.7%) were for stage IV disease. 146 (33.3%) received RT and 187 (42.7%) received no adjuvant chemotherapy. Of those receiving RT, 42 (28.7%) received 3D-CRT, 38 (26.0%) received IMRT, and 66 (44.5%) had unknown RT technique. 28 (6.9%) flaps failed and 64 (15.9%) had a complication. The first model, which included all patients, identified increasing cancer stage (p<0.03) as the most important variable for flap loss with a hazard ratio of 3.4 for DCIS/LCIS, 2.1 for stage I, 7.3 for stage II, and 1.8 for stage III compared to benign pathology. Age was the only variable associated with increased overall complications. In the second model, location of RT, RT technique, and IM directed radiation were not significant predictors of flap loss or complications.

Conclusion: Cancer stage and age are important predictors for flap failure and complications. Use of chest wall radiation therapy was not a significant predictor of flap failure.

PV-0515

GTV delineation of laryngopharyngeal carcinoma on PET is more accurate than on CT and MRI


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Purpose or Objective: Correct GTV delineation is the basis for accurate radiotherapy treatment. It is important to determine which imaging modality (CT, MRI or FDG-PET) results in most accurate GTV delineation. For clinical assessment, both GTV delineations and target volumes adjusted for delineation inaccuracies were compared with histopathology.

Material and Methods: Twenty-seven patients with a laryngeal or hypopharyngeal tumor (T3/T4) were imaged with CT, MRI and FDG-PET followed by laryngectomy. Imaging was performed in radiotherapy positioning mask. GTV was delineated in consensus by three observers on CT and MRI, while a semi-automatic delineation was performed on FDG-PET using an intensity based threshold method. The true tumor volume was delineated by one pathologist on whole-mount histopathological sections. These slides were digitized and the specimen was reconstructed in 3-dimensions. The tumor contours were non-rigidly transferred to the imaging acquired before tumor resection. To cover 95% of the outer contour of all tumors, modality dependent target margins were derived and added to the GTV (Fig. 1a). GTVs and target volumes were compared between the modalities.

![Figure 1: a) A schematic representation of the target margin (blue dotted line) added to the delineated GTV (black) to cover 95% of the outer surface of the tumor (red). b) Examples of target volumes of all patients are shown for the three modalities.](image)

Results: The median tumor volume delineated on pathology was 10.5 ml (range: 3.4 ml - 68.6 ml). Median GTVs delineated on CT, MRI and PET were 17.5 ml, 15.2 ml and 14.8 ml, respectively. None of the GTVs fully covered the pathological tumor volume with a median tumor coverage of 93%, 90% and 87%. In several cases, the position of cartilage invasion was not recognized, which contributed to missing tumor volume.