

was left to the discretion of the treating physician. Overall, 39% of patients experienced grade 3–4 pain and 46% grade 3–4 dermatitis. On univariate analysis, there was a significantly increased risk of grade 3–4 dermatitis for smokers, with higher BMI and chest wall separation >20 cm. On multivariate analysis, grade 3–4 dermatitis was significantly associated with higher BMI ( $p = 0.007$ ), smoking ( $p = 0.04$ ) and the use of boost ( $p = 0.04$ ).

**Conclusion:** Severe acute skin toxicity and pain occur in a significant number of women receiving PMR with chest wall bolus. This study continues to accrue patients and a more detailed analysis of the factors influencing skin toxicity is pending. Identification of the factors associated with severe toxicity will help in defining preventive measures.

366

POSTER

#### Isocentric shift in tangential field breast irradiation for three different breath-hold conditions and its impact on surrounding critical structures

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**Background and purpose:** Treatment of early breast cancer by radiotherapy after breast conservative surgery improves the local control, however improvement in treatment outcome must always be balanced with the potential risk of long-term complications such as late cardiac mortality and radiation-induced pneumonitis. The challenging parameters, which interfere in achieving the treatment outcome and complications are organ motion and setup-errors. In this study, an effort has been made to study the planned isocenter for three different breath-hold techniques and its impact on cardiac, lung and other normal structures during the treatment of tangential field radiotherapy.

**Materials and methods:** Twelve patients with early breast cancer who underwent conservative surgery (eight left-sided and four right-sided) were selected in this study. Prior to imaging, the patients were trained to hold their breath in deep inspiration and deep expiration. Thin Copper wires were placed along the medial and lateral field borders during the time of image acquisition, serving as guiding tools for field placement. Spiral CT scans were performed in Siemens Volume Zoom CT for all the three breathing conditions viz. Deep inspiration breath-hold (DIBH), normal breathing (NB) and Deep expiration breath-hold (DEBH). The average time for which the patients were asked to hold their breath was 18 sec. The CT image data sets were pushed to the Eclipse treatment planning through network. For each patient, simple tangential field plans were created for the three different CT data sets and DVH analysis were performed for the following structures: CTV, heart, ipsilateral lung, contralateral lung, liver and contralateral breast.

**Results:** The median cardiac volumes covered by the 50% CTV dose were 10.05 cc, 2.18 cc and 14.84 cc for NB, DIBH and DEBH respectively which clearly states that the cardiac dose was significantly reduced in DIBH. Similarly for ipsilateral lung, DIBH resulted in reduced dose. For right breast cancer, DIBH resulted in excellent liver sparing. The maximum 3D isocentric shift between NB and DIBH was 2cm with a median value of 1cm, which correlated with the cardiac dose.

**Conclusion:** Our results indicate that in carcinoma breast patients, delivering radiation in inspiration breath-hold condition can considerably reduce the dose to the surrounding normal structures, particularly heart and liver with a good correlation with isocenter shift between the three breath-hold conditions.

367

POSTER

#### Value of fine needle aspiration as a rapid diagnostic tool in a one-stop breast clinic

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**Background:** Breast cancer screening in the general population has been extensively studied. However, methods used in order to establish a definitive diagnosis once a breast abnormality has been described, remain highly variable. We have developed a one-stop diagnosis clinic that relies on fine-needle cytology for the immediate diagnosis of solid lesions. We therefore aimed at evaluating the value of cytology as a rapid diagnostic tool in this setting, with the expectation to be able to provide immediate diagnosis in more than 80% of such lesions, with a high reliability.

**Methods:** A median of 33 new patients with breast cancer abnormalities are seen during a dedicated day once a week at the one-stop breast

diagnosis clinic of our institution. A multidisciplinary team takes care of them during that day, which comprises four breast specialists (surgeon, oncologist, cytopathologist, radiologist). All decisions taken are concerted. Data regarding patients and lesions characteristics, as well as results of explorations performed are prospectively recorded. For the purpose of this study, cytological diagnoses given during the one-stop were compared to final consolidated diagnoses obtained either through surgery, complementary biopsy or further surveillance of benign lesions.

**Results:** During the first 12 months of the one-stop clinic, 697 fine-needle aspirations were performed for suspect solid lesions. Two thirds of them were ultrasound-guided. Median age of the patients was 56 (16–92). Median tumour size was 15 mm (2–20). Cytological diagnosis was cancer in 369 (53%), suspect in 59 (8.4%), benign in 247 (35%), and non significant in 22 (3%). Among patients with cytological diagnosis of cancer, only one appeared not to have cancer but a pseudo-tumoural adenosis (correct diagnosis 99.7%). Among patients with suspect diagnosis, 69% had cancer and 7% atypical hyperplasia. Among patients with a benign cytology, 8 had a final diagnosis of cancer (3%), as assessed rapidly because of discordance between cytologic result and clinico-radiologic features. 0% of 14 patients with Birad ACR2, 3.2% of 152 with ACR3, 43% of 171 with ACR4 and 97% of 353 with ACR5 lesions were cancers. The negative predictive value of cytology was 96.3%, while the positive predictive value was 99.7%. An exact definitive diagnosis could be given within the same day in 87% of the patients.

**Conclusion:** Fine needle aspiration appears as a very efficient diagnostic tool for use in one-stop breast clinic.

368

POSTER

#### The prognostic value of lymph node micrometastasis in patients with breast cancer

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**Background:** Since the introduction of the Sentinel Lymph Node (SLN) biopsy for management of breast carcinoma, lymphogenic micrometastases are diagnosed in 15–20% of the patients. These small amounts of tumour in the affected lymph node create confusion due to their unclear prognostic meaning. Is the prognosis comparable to patients with N1 disease and are micrometastasis thus an indication for adjuvant systemic therapy or should patients with micrometastatic tumour deposits be considered as N0-patients?

**Method:** Between 24–06–1999 and 12–09–2003 300 consecutive patients with a cT1/2 N0 breast carcinoma underwent surgery. The presence of lymphogenic node metastasis in the SLN was determined by H&E and immunohistochemistry staining following serial sectioning on the sentinel node with 250 micrometer intervals. Based on the presence of tumour in the SLN patients were divided in to three groups: N0: no metastasis ( $n = 167$ ), N1micro: 1 micrometastasis <2 mm ( $n = 50$ ) en N1: metastasis >2 mm ( $n = 83$ ). The median follow-up was 3 years.

**Results:** At the end of follow-up 16 patients had died and 26 had developed breast cancer recurrence: distant metastasis ( $n = 20$ ), a contralateral breast carcinoma ( $n = 3$ ) and locoregional relapse ( $n = 6$ ). The cumulative 1- and 3-years disease free survival was 97%, and 93% respectively. The 1- and 3-years disease free survival was 99% and 95% in patients with N0 disease, 100%, and 97% in the N1micro group and 91% and 86% for patients with macrometastasis ( $p = 0.008$ ).

**Conclusion:** After a limited follow up, it appears that disease free survival for patients with micrometastasis is comparable to patients without lymphogenic metastasis and consequently more favourable than patients with macrometastasis. The presence of micrometastatic disease in the SLN is in itself no indication for adjuvant systemic therapy.

369

POSTER

#### Outcome of early breast cancer (EBC) after conservative surgery and radiotherapy: a multicenter, observational study on 1176 patients treated in Lombardy (Italy) in 1997

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**Background:** A survey performed in 1996 showed that clinical practices concerning radiotherapy for EBC varied significantly across Lombardy.

A multicenter, observational study was therefore designed to correlate different treatment strategies and techniques with clinical outcome.

**Material and methods:** All patients irradiated during 1997 to the breast after conservative surgery in each of 12 participating Centers were included in the study, yielding a total of 1620 cases. However, 4 Centers were not able to update the follow-up after 2001, and all their cases were excluded from the present analysis, based on the remaining 1176 patients treated in 8 Centers. Relevant baseline patients' characteristics were the following: age was 25–50 years (y) in 32%, 51–65 y in 44%, and 66–80 y in 24% of cases; pT-stage was T1a in 3%, T1b in 21%, T1c in 54% and T2 in 19% of cases; pN-stage was N0 in 71%, N+(1–3) in 21%, and N+(>3) in 8% of cases; estrogen and progesterone receptor status was positive in 68% and 53% of cases, respectively. Surgical procedure was quadrantectomy in 97% of patients, with axillary dissection performed in 96% of cases. Adjuvant chemotherapy alone was given to 24%, chemotherapy and hormonal treatment to 11%, and hormonal treatment alone to 38% of the patients, while 27% of patients received no adjuvant medical treatment. Median interval from surgery to RT was 57 days; CT- or external contour-based 2-D treatment planning was performed in 89% of patients; total ICRU dose to the whole breast was 50 Gy in 85% of cases; a boost dose was given in 60% of cases (dose range, 5–18 Gy); total dose to tumor bed was 50 Gy in 31% and 60 Gy in 54% of cases; median RT duration was 42 days.

**Results:** With a median follow-up of 6.2 y (range, 0.2–8.2 y) disease-free, overall and disease-specific survival rates at 5 years are 90%, 95% and 96%, respectively; local, regional and distant control rates at 5 years are 98%, 99% and 92%, respectively (see Table). Factors significantly predicting for decreased disease-free survival in a multivariate analysis were high pN-stage ( $p < 0.001$ ), lack of adjuvant treatment ( $p = 0.001$ ), high grade ( $p = 0.004$ ), high pT-stage ( $p = 0.009$ ), multifocality ( $p = 0.039$ ), and pre-menopausal status ( $p = 0.043$ ). Factors that significantly predicted for decreased local control were younger age ( $p = 0.005$ ), lack of adjuvant treatment ( $p = 0.009$ ) and high pN stage ( $p = 0.03$ ).

	3 year	5 year	7 year
Disease-free survival	94%	90%	85%
Overall survival	97%	95%	92%
Disease-specific survival	98%	96%	94%
Local control	99%	98%	95%
Regional control	99%	99%	98%
Distant control	95%	92%	90%

**Conclusions:** In a multicenter, population-based setting, conservative surgery followed by RT was associated with excellent rates of local-regional control and disease-specific survival. Despite several differences in radiotherapy techniques, clinical outcome was comparable between Centers. Patient age, tumor-related factors and adjuvant treatment were significant predictors for both survival and local control.

370

POSTER

#### Left breast irradiation in breast conservative cancer treatment: analysis of doses in V20 in lung and heart

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**Introduction:** In the last few years, the incidence of breast cancer is increasing progressively. Simultaneously, the used of breast conservative treatments and new more cardiotoxic chemotherapy regimens are widely used in this group of patients. The risk of cardiac and pulmonary complications increases as the volume of and the dose to these structures increases. We analyzed the V20 dose to lung and heart using a CT treatment planning.

**Material and methods:** We analyzed 42 left side breast cancer patients, treated with breast conservative treatment and radiotherapy. We treated regional nodes (supraclavicular and axillary nodes) in 6 patients. All the structures (whole breast, tumor bed, lung and heart) were identifying using CT treatment planning, and 1 cm slices were taken through the whole breast. All the patients were treated with an isocentric technique with opposite tangential fields, and wedge filters, with photons of 4 MV in 30 patients and with 6 MV in 12 patients. All the patients received whole breast radiation therapy for a total dose of 50 Gy in 200 cGy daily, followed by a boost to the tumor bed. Chemotherapy was administered in 24 patients (57%), and this treatment was concurrently in 5 patients.

**Results:** The treatment planning system in 3D used were a Theraplan plus Median V20 dose in lung were 6.20 cGy (range 0–21.4) and median dose in heart were 1.35 cGy (range 0–5.4). None of the patients presented any

clinical cardiac or pulmonary toxicity (no fibrosis, edema or cardiac failure), included patients with concurrent chemotherapy. We analyze the factors that influence in these results, like technique of simulation, determination of target volume and selection of treatment planning.

#### Conclusion:

- The CT treatment planning in 3D in left breast cancer is a method that achieve an homogeneous doses in the target volume and simultaneously can accurately preserve the risk organs like heart and lung.
- In our series, the dose of radiation that achieves the cardiac muscle is very low, That's why the secondary effects and late toxicity are very rare and without any clinical repercussion.

We need more studies to demonstrate that we can use concurrent chemoradiotherapy treatments in breast cancer without increased the risk of cardiac or pulmonary toxicity

371

POSTER

#### Results and prognostics factors in patients with breast cancer treated with adjuvant radiotherapy after mastectomy

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**Objective:** To retrospectively evaluate the efficacy of the treatment and possible prognostic factors in patients treated with adjuvant radiotherapy after mastectomy.

**Materials and methods:** Between January 1994 and December 2001, 899 patients with a diagnosis of breast cancer were treated with adjuvant radiotherapy after mastectomy in Hacettepe University, Faculty of Medicine, Dept. of Radiation Oncology. Radiotherapy was routinely applied to patients with positive surgical margin, skin-fascia invasion, tumor size of more than 4 cm, more than 3 lymph node (LN) metastasis and incomplete axillary dissection (< 10 LN). Chest wall ± periferic lymphatics were irradiated with conventional daily fractionation to a total dose of 46–50 Gy.

**Results:** The median age was 47 years (range, 19–85 years). Seven hundred sixty (85%) patients had modified radical mastectomy, 74 (8%) had radical mastectomy, 65 (7%) had simple mastectomy before radiotherapy. Median follow up was 62 months (range, 4–136 months). The actuarial overall 5-year survival (OS) was 82%, whereas the actuarial 5-year disease-free survival (DFS), loco-regional relapse free survival (LRRFS), and distant metastasis-free survival (DMFS) rates were 67%, 90%, and 74%, respectively.

Univariate analysis for OS revealed significance for tumor size ( $\leq 5$  cm vs.  $> 5$  cm,  $p < 0.0001$ ), number of metastatic LN (0 vs. 1–3 vs.  $> 4$  LN,  $p < 0.0001$ ), percent positive nodal involvement ([metastatic nodes/total nodes removed]  $\times 100$ ; 0% vs.  $\leq 25$ % vs. 26–50% vs.  $> 50$ %), AJCC 2002 stage ( $p < 0.0001$ ), surgical margin status (negative vs. positive,  $p = 0.02$ ), surgery type ( $p < 0.0001$ ), neoadjuvant chemotherapy (present vs. absent,  $p < 0.001$ ), adjuvant hormoneotherapy (present vs. absent,  $p = 0.008$ ) and grade (grade I vs. grade II vs. grade III/IV,  $p = 0.05$ ). For DFS number of metastatic LN ( $p < 0.0001$ ), percent positive nodal involvement ( $p < 0.0001$ ), AJCC 2002 stage ( $p < 0.0001$ ), surgical margin status ( $p = 0.04$ ), vascular invasion (present vs. absent,  $p = 0.007$ ), perinodal fat tissue invasion (present vs. absent,  $p = 0.004$ ), neoadjuvant chemotherapy (present vs. absent,  $p = 0.0001$ ), adjuvant chemotherapy (present vs. absent,  $p = 0.05$ ) and surgery type ( $p = 0.0006$ ).

Multivariate analysis revealed importance for grade, tumor diameter, percent positive nodal involvement, hormonal treatment, and surgical margin status in OS. Age ( $\leq 40$  years vs.  $> 40$  years), grade, percent positive nodal involvement, neoadjuvant chemotherapy and stage were found to be significant for DFS.

**Conclusions:** In this study, we have revealed percent positive nodal involvement as a poor prognostic factor for all survival in end points and found the worst prognosis for patients having more than 50% nodal involvement. It seems that percent positive nodal involvement instead of crude number of metastatic LN more informative for prognosis.

372

POSTER

#### Breast cancer in the US, UK, France, and Germany: whom do patients see and how do they get medical information?

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**Background:** Breast cancer is the No. 1 cancer in women, and the No. 2 cause for death due to cancer. However, it is unknown if country-specific consultation patterns exist for these patients and how these patients obtain medical information.

**Materials and methods:** A comprehensive, cross-sectional survey of adults  $\geq 18$  years in the US, UK, France, and Germany was conducted in May-June 2004. Patients were drawn from nationally representative Internet panels through Harris Interactive (US, Europe). Invitations were sent to a