was associated with less risk of local relapse (HR 0.94, 95% CI; 0.91–0.98). Nodal and local relapse correlated significantly with distant metastases. After a median of 3.7 years (range 0.6−9.2) from CS 19/24 patients (79.2%) with nodal relapse and 12/27 (44.4%) with local relapse developed distant metastases (chi square test $p < 0.000$ for both). Nodal and local relapses were concomitant or followed metastases in 13 and 2 patients, respectively. Metastases were found in 8.4% patients without nodal relapse and in 9.7% without local relapse.

**Conclusions:** In patients with early stage breast cancer and 1−3 positive nodes the incidence of regional nodal failure is low after CS. Even though it appears to correlate with worse prognosis, we do not recommend RT of draining nodes until results are available from randomized trials.

**242** Poster

**Significantly better cosmetic outcome after intra-operative radiotherapy compared with external beam radiotherapy for early breast cancer: objective assessment of patients from a randomised controlled trial**

N.R. Williams[1], M. Keshtgar[2], T. Corica[3], C. Saunders[4], D. Joseph[3]. *[1]Clinical Trials Group UCL, Department of Surgery, London, United Kingdom; [2]Royal Free Hospital, Department of Surgery, London, United Kingdom; [3]Sir Charles Gairdner Hospital, Department of Radiotherapy, Perth, Australia; [4]Sir Charles Gairdner Hospital, Department of Surgery, Perth, Australia*

**Background:** The international randomised TARGIT Trial started accrual in 2000 to determine if there is equivalence between the novel technique of IORT [intra-operative radiotherapy with Intrabeam® (Carl Zeiss, Germany)] and conventional external beam radiotherapy (EBRT) in women with early, low risk breast cancer suitable for breast conservation as primary treatment. The main outcome measure is risk of local relapse within the treated breast. We report here the one-year data from a sub-protocol assessing cosmesis in a sub-set of 118 women over 50 years old participating in the TARGIT Trial from one centre (Perth, Australia).

**Materials and Methods:** Frontal digital photographs from 118 patients (60 IORT, 58 EBRT) taken at baseline and one year after completion of breast conserving surgery were assessed blinded to randomised treatment using specialist software (BCCT.core 2.0, INESC Porto, Portugal) which produces a composite score (Excellent, Good, Fair, Poor) based on symmetry, colour and scar. Statistical advice on logistic regression using Stata (StataCorp, USA) was given by the Biostatistics Group, The Joint UCL, UCLH, & Royal Free Biomedical Research Unit.

**Results:** Median age at randomisation was 61 (IQR 56−67) years; photographs were taken before and after surgery (median 11 months, IQR 11−12); all patients were free from recurrence. The composite scores were combined into Excellent/Good and Fair/Poor, see Table 1. 77% (46/60) of patients randomised to IORT had Excellent/Good cosmetic outcome at one year, compared with 60% (35/58) randomised to EBRT. The odds of Excellent/Good outcome at one year, adjusted for the baseline composite score, was significantly higher in the IORT group compared to EBRT, adjusted Odds Ratio = 2.38 (95% CI 1.04–5.43), $p = 0.039$.

**Conclusions:** These results indicate that the cosmetic effects of targeted radiotherapy using Intrabeam® are significantly improved compared to those obtained with conventional EBRT, one year after surgery.

Table 1. Cosmetic outcome by randomised treatment at baseline and one year (n = 118)

| Randomised Tx → | EBRT | | IORT | |
|---|---|---|---|---|
| After one year → Baseline | Excellent or Good | Fair or Poor | Excellent or Good | Fair or Poor |
| Excellent or Good | 32 | 20 | 42 | 9 |
| Fair or Poor | 3 | 3 | 4 | 5 |

**243** Poster

**Estimating contralateral breast exposure from breast cancer radiotherapy in clinical practice**

N. Bese[1], A. Iribas[1], E. Goksel[2], A. Dirican[3], O. Senkesen[2], H. Kucucuk[2], E. Tezcanli[2], C. Uras[4], M. Sengoz[2]. *[1]Istanbul University Cerrahpasa Medical School, Radiation Oncology Department, Istanbul, Turkey; [2]Acibadem University, Radiation Oncology Department, Istanbul, Turkey; [3]Istanbul University Cerrahpasa Medical School, Biostatistic Department, Istanbul, Turkey; [4]Istanbul University Cerrahpasa Medical School, Breast Surgery Unit, Istanbul, Turkey*

**Background:** Radiotherapy (RT) for breast cancer inevitably results in scattered radiation dose to the contralateral breast (CB). A recent paper has shown that the incidence of cancer in the CB was increased (RR 2.5) in women of less than 40 years of age who received a dose >1 Gy to the specific quadrant [1]. In this study we evaluated the CB doses of patients who received postoperative RT for breast cancer.

**Material and Method:** 26 patients who underwent only whole breast (WB) RT (Group 1) and 16 patients with internal mammary chain (IMC) + WBI/chest-wall + supraclavicular ± axillary lymph node RT (Group 2) were retrospectively analyzed for CB doses. All patients received RT after 3-d conformal planning using Eclipse planning system. The total RT dose for WB was 50 Gy in 25 fractions with a 60−66 Gy boost dose to primary tumor side and 50 Gy to chest wall and 46−50 Gy to regional lymphatics in 23−25 fractions. For this analyze 4 quadrants and nipple-areola complex (NAC) of CBs were contoured using treatment planning computerized tomography slices taken with 3−5 mm intervals. Maximum (D1; dose that 1% of the volume received) and mean CB and CB quadrant doses were estimated using Eclipse planning system.

**Results:** Results for group 1 and 2 and the statistical differences between the groups (Mann-Withney test) are shown in the table.

| | Group 1 (n = 26) | Group 2 (n = 16) | p |
|---|---|---|---|
| Maximum dose, mean (min–max) | 1.75 Gy (0.7−3) | 5.5 Gy (1.6–14.5) | <0.001 |
| CB dose, mean | 0.5 Gy | 0.9 Gy | 0.012 |
| Upper Medial (UM) dose, mean | 0.8 Gy | 1.5 Gy | 0.002 |
| Lower Medial (LM) dose, mean | 0.6 Gy | 0.8 Gy | NS |
| Upper Lateral (UL) dose, mean | 0.3 Gy | 0.4 Gy | NS |
| Lower Lateral (LL) dose, mean | 0.2 Gy | 0.2 Gy | NS |
| NAC dose, mean | 0.4 Gy | 0.5 Gy | NS |

Medial wedge was used in 13 patients in group 1 and in 11 patients in group 2. It was found out that the use medial wedge for treatment planning did not significantly increased the mean CB and contralateral quadrant breast doses significantly in both groups. Fisher's exact chi-square test $p = 1.0$).

**Conclusion:** Exposure to CB is found to be low and safe for patients who receive only WB irradiation after 3-d conformal treatment planning. For patients who receive IMC irradiation maximum, mean and UM CB doses found to be higher. Effort should be spend to reduce the mean UM doses for younger patients with IMC irradiation.

**References**

[1] Stovall M et al. Dose to the contralateral breast from radiotherapy and risk of second primary breast cancer in the Wecare Study. Int J Radiat Oncol Biol Phys 2008;72:1021−30.

**244** Poster

**The targeted intraoperative radiotherapy (TARGIT) trial for breast cancer: a review after the first 10 years of clinical application**

M. Baum[1], on behalf of the TARGIT Trialists' Group. *[1]Clinical Trials Group, Department of Surgery UCL, London, United Kingdom*

**Background:** Most early local recurrences occur in the primary tumour bed, despite the fact that multi-centric foci are found in over 60% of cases outside the index quadrant. Thus partial breast irradiation after breast conserving surgery may be an alternative to whole breast external beam radiotherapy (EBRT) for selected patients and is now recommended by many consensus guidelines. The work represents the first long term randomised safety and efficacy data of intra-operative radiotherapy (IORT) as an alternative to EBRT after breast conserving surgery for early breast cancer.

**Materials and Methods:** In July 1998, we pioneered the use of targeted intra-operative radiotherapy (TARGIT) with "INTRABEAM" that delivers therapeutic irradiation (~20 Gy at surface and ~5 Gy at 1 cm) delivered with a spherical applicator, inserted in the tumour bed at the time of surgery. We have established the safety and tolerability of the technique in phase II studies.

In March 2000 we launched an international trial comparing TARGIT vs. EBRT as a non-inferiority study with the primary outcome as local recurrence (LR). The recruitment goal of 2232 (powered to test non-inferiority, HR < 1.25) is expected to be complete by April 2010, by which time the maximum follow-up will be 114 months.

**Results:** An updated analysis of the first 300 patients in a phase II study where IORT was used as the boost, has demonstrated an actuarial 5 year local recurrence free survival of 1.5% in a group of unselected patients. Furthermore over the past 7 years, 77 patients deemed unfit for EBRT have been treated in this way, with median age of 66 years and a median follow-up of 37 months. To date there have been two local recurrences which gives an estimated annual local recurrence rate of 0.78%.

Our combined experience so far suggests that the technique is safe, well tolerated and virtually free of short-term toxicity.

**Conclusions:** If TARGIT is eventually shown to be non-inferior to EBRT then we could offer most women with small operable tumors complete