after adjusting for tumour size. The results were similar when adjusted for tumour grade and age of the patient. For year 1 only there was a statistically significant 2.35 fold increase in the odds of having an outcome of EG for patients in the TARGIT group relative to the EBRT group (OR = 2.35, 95% CI 1.02–5.45, p = 0.047) after adjusting for age of the patient, tumour size and grade.

Conclusions: These results demonstrate a significantly better cosmetic outcome with TARGIT compared to EBRT in the first year after surgery.

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Effect of Radiation Therapy on Local Control in Patients with Positive Surgical Margins After Breast-conserving Surgery

R. Nagaoka[1], J. Horiguchi[1], D. Takata[1], N. Rokutanda[1], A. Satou[1], H. Tokiniwa[1], K. Toduka[1], M. Kikuchi[1], I. Takeyoshi[1]. [1]*Gunma University, Thoracic and Visceral Organ Surgery, Gunma, Japan*

Purpose: The surgical margin status after breast-conserving surgery (BCS) has been associated with the risk of local recurrence. The purpose of study is to retrospectively evaluate the effect of a higher radiation dose on local control in patients with positive margins.

Patients and Methods: A total of 1,083 patients who underwent BCS followed by whole breast irradiation of 50 Gy between 1991 and 2009 were including in this study. 138 patients (13%) with positive margins were assigned to receive or not an extra boost dose of 10 Gy. **A positive margin was defined as tumor seen at 5 mm or less from the resection edge**.

Results: At a median follow-up of 8.5 years, the rate of local recurrence was 2.1% (23/1083). Positive margin status was found to be a significant risk factor for local recurrence. For patients with positive margins, the boost dose of 10 Gy reduced the local recurrence from 23% to 2%. There was no significant difference in local recurrence rate between patients with positive margin who treated with 50 Gy and boost and those with negative margin without boost. In addition, patients with positive margin who treated with 50 Gy and boost showed no significant difference in local relapse rate compared with patients who underwent additional local resection before whole breast irradiation.

Conclusion: Our results suggest that boost irradiation to the tumor bed in patients with positive margins after breast-conserving surgery reduces local recurrence.

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Patient Preferences for Adjuvant Radiotherapy in Early Breast Cancer − an Australian Sub-study of the International TARGIT Trial

T. Corica[1], A. Nowak[2], C. Saunders[3], M. Bulsara[4], D. Joseph[5]. [1]*Sir Charles Gairdner Hospital / University of Western Australia, Radiation Oncology / School of Medicine and Pharmacology, Perth, Australia;* [2]*University of Western Australia, School of Medicine and Pharmacology, Perth, Australia;* [3]*University of Western Australia, School of Surgery and Pathology, Perth, Australia;* [4]*University of Notre Dame, Institute of Health and Rehabilitation Research, Perth, Australia;* [5]*Sir Charles Gairdner Hospital / University of Western Australia, Radiation Oncology / School of Surgery and Pathology, Perth, Australia*

Background: The multicentre randomized TARGIT trial compares single dose intra-operative radiotherapy (IORT) with 6−7 weeks of conventional external-beam radiotherapy (EBRT) in women with early breast cancer (EBC) at low risk of local recurrence (LR). The primary endpoint is LR rates; the *a priori* hypothesis is that IORT will give a non-inferior risk of LR compared with EBRT. Early results suggest non-inferiority however mature results are not yet available. It is unclear what LR risk patients and clinicians consider 'non-inferior'. In order to guide women and their doctors making choices about radiotherapy for EBC, a Patient Preference study was performed to determine what increased risk of LR, without detriment to survival, women who have completed radiotherapy for EBC would accept, in return for the increased convenience and possibly decreased toxicity of IORT.

Methods: This is a cross-sectional study of patient preferences and their determinants in 209 women who had radiotherapy on the TARGIT trial in Western Australia. Preferences were obtained from 108 participants who received IORT and 101 who received EBRT. Preferences were determined by a self-rated questionnaire using validated trade-off methodology. Disease, treatment, and demographic details were collected, and quality of life during radiotherapy was self-rated by patients.

Results: While 36% of patients were prepared to accept a 4%-6% increase in risk of LR for the increased convenience of IORT, 22% would not accept IORT at all. Multivariate Poisson regression identified treatment received as the only significant determinant of patient preferences (p < 0.0001). This is despite significant differences found in two-sample Kolmogorov-Smirnov tests of quality of life scores during treatment all favouring IORT. Comparison of the treatment groups found that 60% of IORT patients would accept IORT at an increased risk of 4%-6% in contrast to 12% of patients in the EBRT group. Only 2% of IORT patients indicated they would not have IORT at all, in contrast to 43% of EBRT patients.

Conclusion: Willingness of patients to accept IORT was discordant between the two treatment groups. The EBRT group were risk-averse, whilst patients who had IORT valued the convenience of IORT highly. Participants of this study have justified the treatment they were randomly allocated to, which questions the validity of post-treatment patient preference studies. Further research targeting patients who have not yet received radiotherapy will now follow, in order to better inform future patients and their clinicians. Given the early results of the TARGIT trial however, it is unlikely that the clinical difference in LR between IORT and EBRT will exceed what patients will accept.

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Simultaneous Integrated Boost in Breast Conserving Radiotherapy − Is Replanning Necessary Following Tumor Bed Change?

Z.Z. Yang[1], J.Y. Chen[1], J. Xie[1], X.M. Guo[1]. [1]*Fudan University Shanghai Cancer Center, Radiation Oncology, Shanghai, China*

Background: Tumor bed (TB) change is well-known phenomenon during the whole breast irradiation (WBI) in early stage breast cancer patients. The aims of this study were to evaluate change in seroma volume on repeat Computed Tomography (CT) scans and to explore whether replanning is necessary in breast conserving radiotherapy (RT) using the intensity modulated radiotherapy with simultaneous integrated boost (IMRT-SIB).

Methods and Materials: Thirty patients underwent WBI with 84 CT scans (24 patients with three CTs and 6 patients without the third CT) during the five weeks of RT were reviewed. TB and other target volumes on all CTs were delineated and compared. IMRT-SIB treatment plans with 50.68 Gy to the whole breast and 64.4 Gy to the boost in 28 fractions were constructed in the first CT. Replanning and hybrid plan (without replanning) on the second CT were reproduced. Dosimetric difference between the replannings and hybrid plans were compared.

Results: The mean TB volumes for the 1st CT, 2nd CT and 3rd CT were 42.1 cm^3, 20.1 cm^3 and 17.0 cm^3, respectively. The mean TB reduction was 40.5% from the 1st CT to 2nd CT and 4.3% from the 2nd CT to 3rd CT. The difference of TB volumes between the 1st CT to 2nd CT was statistically significant (p < 0.001), but not significant between 2nd CT to 3rd CT (p = 1.000). For all patients, target coverage remained adequate with either hybrid plans or replannings. However, replanning can significantly decrease the whole breast mean dose (35.2 Gy vs.35.6 Gy, p = 0.026) and breast volume outside the boost receiving 95% of the boost prescribed dose (39.5 cm^3 vs. 68.2 cm^3, p < 0.001).

Conclusions: TB change existed significantly during the WBI. Although boost volume could irradiate adequately without replanning after the shrinkage of seroma with IMRT-SIB, replanning could avoid the undesired high dose irradiation to the breast volume.

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Late Radiation Toxicity After Intraoperative Radiotherapy (IORT) for Breast Cancer: Results From the Randomized Phase III Trial TARGIT A

E. Sperk[1], G. Welzel[1], A. Keller[1], U. Kraus-Tiefenbacher[1], A. Gerhardt[2], M. Sütterlin[2], F. Wenz[1]. [1]*Mannheim Medical Center University of Heidelberg, Department of Radiation Oncology, Mannheim, Germany;* [2]*Mannheim Medical Center University of Heidelberg, Department of Obstetrics and Gynecology, Mannheim, Germany*

Background: The first results from the randomized phase III trial TARGIT A (Vaidya et al., Lancet 2010) showed non-inferiority of intraoperative radiotherapy (IORT) compared to whole breast radiotherapy (WBRT) after breast-conserving surgery (BCS) regarding local recurrence. Here, we analyse long term toxicity.

Materials and Methods: Between February 2002 and December 2008, 109 patients were treated within the TARGIT A trial in a single center (Arm A (IORT, 20 Gy), n = 34 IORT, n = 20 IORT + WBRT (46−50 Gy); Arm B (WBRT 56 Gy) n = 55). Patients (n = 196) receiving an IORT boost followed by WBRT were used as a control. Follow-up was performed every six months during the first two years and yearly thereafter. Toxicity was assessed according to the LENT SOMA scales. Additionally mammography, ultrasound and photo documentation were done routinely. Cumulative incidences were calculated with Kaplan-Meier-estimates.

Results: In general long term toxicities were in range with the expected toxicities after radiation treatment of the breast. Fibrosis had a cumulative rate of 5.9% for Arm A IORT, 37.5% for Arm A IORT + WBRT and 18.4% for Arm B (38.2% for non-randomized control group) at 3 years. Chronic skin toxicities were very low after IORT alone (0% Arm A IORT vs. 17.5% Arm A IORT + WBRT vs. 17.7% Arm B). The calculated Hazard ratio