used schedule for whole breast irradiation after breast concerving surgery is 2 Gy daily fractions given 5 times a week to a total dose of 50 Gy over 5 weeks with the optional addition of a boost to the primary site to 10 Gy in 5 daily fractions over 1 week. We present our clinical trial utilizing radiation therapy to deliver accelerated hypofractionated whole breast irradiation in patients with early-stage breast cancer treated with breast conserving therapy.

Methods and Materials: Between March 2002 and March 2003, 70 patients with Stage 0−3 breast cancer were enrolled at National Cancer Center Hospital, Japan, institutional review board-approved. Eligibility criteria included invasive ductal and lobular histologies as well as ductal carcinoma in situ, lumpectomy, and written patients consent. The prescribed dose was 40 Gy in 16 fractions given over 3 weeks to whole breast using 4MV or 6MV X-ray. Addition of a boost to the primary site to 10 Gy in 5 daily fractions over 1 week was delivered patients with closed surgical margin (<5 mm). All patients were treated once a day.

Table: Patients and tumor characteristics

Characteristic	
Median age (range)	54 yrs (30−76)
Clinical stage	
0	7 patients
1	24
2	33
3	3
Pathohistology	
Intraductal carcinoma	7 patients
Invasive ductal carcinoma	53
Others	7
Median pathological tumor size (range)	19 mm (5−67)
Surgical margin	
Negative	45 patients
Close or positive	22
Axillar dissection	
yes	60 patients
Sentinel lymph nodes biopsy	
Yes	6
No	1
Lymph node metastasis	
no	62 patients
1−3	7
4−	0
Grade	
1	8 patients
2	36
3	23
Estrogen receptor status	
Positive	48 patients
Negative	19
Systemic chemotherapy	
No	46 patients
Preoperative	8
Postoperative	13
Hormone therapy	
No	47 patients
Yes	20

Results: The median follow-up after radiotherapy was 85 months (range, 3−92 months). 3 patients without protocol treatment were excluded the analysis.

Baseline characteristics including age, tumor size, estrogen receptor status, tumor grade etc were presented in table.

Three patients experienced a local breast cancer recurrence as a first event.

At 7 years, local recurrence-free survival was 94.4%. Any recurrence was noted as a first event − 11 events were identified. (3 local recurrences, 2 regional recurrences, and 6 distant recurrences). At 7 years, disease-free survival rate was 82.3%. At 7 years, overall survival rate was 98.3%.

In late radiation toxicity of the subcutaneous tissue, no grade 2, 3 was observed. Incidence of grade 0 was 70% and grade 1 was 30%. No skin telangiectasia was observed. One patient developed rib fracture at 23 months.

Conclusion: Hypofractionated whole breast irradiation for breast conserving therapy is a highly effective and safe treatment for Japanese women.

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Prognostic factors in patients treated with radiotherapy for bone metastasis from breast carcinoma

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Background: The aim of this study was to evaluate prognostic factors and to analyze the overall survival of patients with bone metastasis due to breast carcinoma.

Materials/Methods: We performed a retrospective review of 137 patients with bone metastasis (BM) from breast cancer who were treated with radiotherapy (RT) between 1999–2008. All patients had histologically confirmed breast cancer. Median age was 49 (range 26−83). At the time of BC diagnosis: 72 (53%) patients were premenopausal, 64 (47%) were postmenopausal. ER+, PR+ and HER2 phenotypes were represented by 67%, 64%, 69% of this group, respectively. Fourty patients (29%) had one bone metastasis, 25 (18%) had two, 14 (10%) had three and 58 (42%) had more than four bone metastases. Due to first bone metastases, RT was mostly applied to thoracal vertebra region (26%). Most patients (80%) had received a total dose of 30 Gy in fractions of 3 Gy.

Results: Median follow-up was 57 (3–279) months. At the time of analysis, 65 patients had died with disease, 72 were alive. The median time from BC to BM was 35 (1–192) months. The median overall survival after diagnosis of bone metastasis was 43 months. Overall survival rate at 2 and 5 years was 87% and 63%, respectively. Age, menopausal status, clinical stage, Karnofsky performance status, grade, ER, PR and HER-2/neu status, alkaline phosphatase (ALP) and calcium levels, RT fields, number of bone metastases, the presence of distant metastasis before BM and interval from BC diagnosis to BM were investigated as a prognostic factors. Univariate and multivariate analysis demonstrated that ER, PR, HER-2/neu and ALP level in serum were statistically significant predictors of survival.

Conclusions: This study demostrated that ER, PR positivity and HER-2/neu negativity and low level of ALP were significantly associated with better survival in bone metastasis due to breast carcinoma.

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Four times weekly adjuvant breast radiotherapy with a moderately intensified boost to the tumour bed − feasibility and acute toxicity

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Background: Standard safe schedules for adjuvant breast radiotherapy (RT) after breast conserving surgery use a dose of 45−54 Gy with fraction doses of 1.8−2.5 Gy in an overall treatment time of 35−38 days to the whole breast [1]. A boost of 16 Gy to the tumor bed improves local control but leads to increased fibrosis in the boost area [2]. The optimal dose and technique for the boost remain unclear. Biological considerations such as the low α/β ratio in breast cancer [3−5] and accelerated proliferation as well as the possibility of selecting resistant residual tumor cells are in favour of a dose intensification of the boost after whole breast RT (WBI). We chose a moderate intensification to avoid fibrosis and hypothesize that four times weekly adjuvant breast RT with a moderately intensified boost to the tumour bed is feasible and yields acceptable acute toxicity in patients $\leqslant$70 years.

Material and Methods: 50 consecutive patients $\leqslant$70 years with ductal carcinoma in situ or pT1−2 (ypT0included) pN0−1 invasive breast cancer after breast conserving surgery with or without chemotherapy and/or hormonotherapy were studied. Treatment consisted of 21×2.25 Gy WBI followed by a boost of 6×2.5 Gy to the tumor bed during $6\frac{1}{2}$ weeks by two tangential photon beams (6−18 MV) for WBI and photon or electron beams for the boost depending on tumour location. Acute RTOG-EORTC skin toxicity in the breast and the boost region was assessed weekly during treatment and six weeks after the end of RT.

Results: The median age of the patients was 57 (33−69) years. Seven patients had ductal carcinoma in situ, 43 patients invasive carcinoma. Median overall treatment time was 44 (42−46) days. Acute G1, G2 and G3 skin toxicity occurred in 13 (26%), 30 (60%) and seven patients (14%) in the boost region and in 18 (36%), 30 (60%) and two patients (4%) outside the boost. At a median follow-up of six weeks after the end of RT, remission of skin toxicity ($\leqslant$G1) was seen in all but two patients with G2 toxicity.

Conclusions: On the basis of biological considerations and promising results of hypofractionated schedules [6−9], an intensified boost to the tumour bed after WBI may improve local control. Our schedule using four times weekly WBI followed by a moderately intensified boost to the tumour bed is feasible and well tolerated at short term in patients $\leqslant$70 years

and expected to be well tolerated at long term. It facilitates acceptance by patients because of a limited number of treatment sessions and may contribute to a more efficient use of treatment facilities.

References

[1] Van de Steene J, Radiother Oncol 2000.
[2] Bartelink H, J Clin Oncol 2007.
[3] Cohen L, Br J Radiol 1952.
[4] Douglas BG, Prog Exp Tumor Res 1984.
[5] Bentzen SM, Radiother Oncol 1991.
[6] Bentzen SM, Lancet 2008.
[7] Bentzen SM, Lancet Oncol 2008.
[8] Whelan T, J Natl Cancer Inst 2002.
[9] Whelan T, Abstract, SABCS 2007.

255 Poster

The tolerance and efficacy of intraoperative radiotherapy (IORT) after conservative treatment in breast cancer

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Background: IORT after conservative treatment in breast cancer allow to raise total radiation dose in tumor bed and ought to reduce local recurrence risk. The aim of the study was to estimate tolerance and efficacy IORT with whole breast irradiation after breast-conserving treatment.

Material and Methods: Between 2003 and 2004, 112 patients with early stage breast cancer (T1−2, N0−1) were treated in Center of Oncology Maria Sklodowska-Curie Memorial Institute, Branch Gliwice in Poland. All patients had breast conservative treatment (wide tumor excision with regional lymph nodes) followed by Intraoperative Radiotherapy using Low-Energy X Rays. The total dose was 5−7.5 Gy and was specifed 0.5 cm depth from tumor bed. After surgery patients received external beam radiation therapy to the whole breast. The total dose was 50 Gy delivered in 25 fractions. The radiotherapy included also regional lymph nodes if pathological stage was classified as N+.

Acute and late toxicity of treatment was evaluated according to RTOG/EORTC criteria. The evaluation of normal tissue early reactions included also the analysis of wound healing time. A Kaplan-Meier method was used to plot survival curves.

Results: Extended wound healing time after operation with IORT was the most frequent and occured in 16% of patients. Wound infection was observed in 15%, fistula or necrosis in 10% and hematoma in tumor bed in 9% of patients. 66 patients (59%) developed Grade I, 12 patients (11%) Grade II and 17 patients (15%) Grade III early skin toxicity. Late skin toxicity in Grade I was observed in 31 patients, Grade II developed 9 patients. Late toxicity from subcutaneous tissues in Grade I, II, III properly developed 56 (50%) patients, 8 patients (7%) and 1 patient (1%). The median follow up was 5 years. 5-year disease free survival was in 88%. In 3 patients (2%) occurred local recurrence. Distant metastases occurred in 7 patients (6%).

Conclusions: The results of the study have shown that IORT with whole breast conventional radiotherapy after conservative treatment in early stage breast cancer was well tolerated. The risk of local recurrence and distant metastases in those group of patients was low.

Thursday, 25 March 2010 18:15–19:15

POSTER SESSION

Surgical management (including reconstructive surgery)

256 Poster

Resection margins in breast conservation surgery: what is an adequate margin?

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Background: Adequate surgical margins are the strongest predictors of local recurrence following breast conservation surgery (BCS). Involved margins carry a significant risk of local recurrence despite radiation therapy. However, there is no consensus as to what is considered an adequate margin. We therefore sought to determine the incidence of residual tumour following BCS, and to identify factors predictive of residual tumour and local recurrence.

Materials and Methods: A retrospective review was performed of 550 patients who underwent BCS at our institution from January 2001 to December 2008. In most cases, wide excision extended from beneath the skin to the pectoralis fascia. The presence of residual tumour and local recurrence was correlated with the closest surgical margin and standard clinicopathological parameters.

Results: Forty-seven of 185 patients (25.4%) who underwent repeat surgery were found to have residual tumour. Twenty-six percent (44 of 170) of patients with involved or close margins had residual tumour, compared to 10% (1 of 33) of those with margins of 1 mm; this was not statistically significant. Two patients with margins of more than 1 mm were found to have separate foci of tumour on repeat surgery. The anterior or posterior margins alone were close or involved in 46 patients; 8 of whom underwent repeat surgery. No residual tumour was found in all cases, although a separate focus of invasive carcinoma was found in 1 patient. None of the 38 patients who did not have repeat surgery developed local recurrence. No factors predicting for residual tumour were identified; notably, margins status did not correlate with the presence of residual tumour or the risk of local recurrence. Only lymphovascular invasion and oestrogen receptor status were independent predictors of local recurrence on multivariate analysis. There were no difference in the local recurrence rate between margin status of 1 mm, 2−5 mm and more than 5 mm (4.5%, 5.7% and 7% respectively).

Conclusions: Our study finds that radial margin of 1 mm result in acceptable and similar local recurrence rate when compared with larger margins and thus re-excision is not necessary. Furthermore, anterior or posterior margins status does not affect local recurrence if the excision had been taken from the skin down to the pectoralis fascia. In addition, factors other than margin status affect local recurrence in BCS.

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Quality of care through the eyes of breast cancer patients: an assessment before and after implementation of a short stay programme following breast cancer surgery

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Background: Short admission following breast-cancer surgery is an established and safe care protocol that has not, as yet, been widely implemented across Europe. Aim of this study was to assess breast-cancer patients' opinions on quality of breast-cancer care before and after implementation of a short stay protocol, including disease-management principles, and to formulate patient-inspired targets for further quality improvement.

Material and Methods: Patients were asked to complete a self-administered validated questionnaire on quality of breast-cancer care six weeks after surgery. The study was conducted in four hospitals in the Netherlands, following a before-after design, and included two six-month measurement periods between December 2005 and June 2007. These measurements were performed after implementation of the short stay programme and in the care as usual situation, i.e. before implementation of the short-stay programme.

Results: Among 421 eligible patients, 324 (77%) signed informed consent and 281 (87%, before implementation: 137/161; after implementation: 144/163) completed the questionnaire. Scores on quality of patient education regarding postoperative treatment-related aspects showed a slight deterioration (e.g. education on drain care and education on a prosthesis). Services by the breast nurse remained stable, while services by the surgeon, patient education regarding activities at home, and patient education regarding postoperative treatment-related aspects remained stable on average with a greater variation: some aspects showed improvement and other deteriorated somewhat. Although several separate quality of care items not belonging to a specific factor had improved slightly after introduction of the short stay programme (such as the availability of