minimize side effects became more important. To reduce the dose to lung and heart in the case of chest wall irradiation using an appositional electron beam, we used an individualized custom bolus which was accurately designed to compensate the difference of chest wall thickness. The benefits were evaluated by comparing the normal tissue complication probabilities (NTCPs) and dose statistics with boluses to those without boluses.

Methods: Boluses were made and the effects were evaluated for ten patients treated with the reverse hockey stick technique. Electron beam energy was determined in order to irradiate 80% of the prescription dose to the deepest lung-chest wall boarder, which was usually located at the internal mammary lymph node chain. An individualized custom bolus was made to compensate the chest wall thinner than the prescription depth by accurately measuring the chest wall thickness at 1cm2 interval on the planning CT images. Second planning CT was obtained overlying the individualized custom bolus to each patients' chest wall. 3-D treatment planning was performed using ADAC-Pinnacle3 for each patient with or without bolus. NTCPs based on "the Lyman-Kutcher" model were analyzed and the mean, maximum and minimum doses for heart and lung were computed.

Results: The average NTCPs in the ipsilateral lung were reduced from 80.2 ± 3.43% to 47.7 ± 4.61% when individualized custom boluses were used, which shows statistically meaningful reduction ($p < 0.01$). The mean lung dose also was reduced about 430 cGy from 2757 cGy to 2327 cGy. The reduction of NTCP and the mean lung dose appeared to have statistically meaningful correlation since 'p value' was < 0.01. The NTCP in the contralateral lung as well as the heart were 0% even in the case of no bolus due to the small effective radiation volumes, mean value 4.4% and 7.1% respectively.

Conclusion: The use of an individualized custom bolus in the radiotherapy of postmastectomy chest wall reduce the NTCP of ipsilateral lung about 30-35%, which can increase the complication free cure probability of breast cancer patients.

690 POSTER

Salvage peroperative hdr or PDR brachytherapy for chest wall or infraclavicular recurrence of breast cancer in post mastectomy patients - a feasibility study

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Introduction: For patients with a local recurrence of post mastectomy breast cancer after external beam radiation (EBRT), we investigated the feasibility of fractionated salvage HDR or PDR brachytherapy (BT).

Material and methods: Thirteen patients with a local recurrence after EBRT and 1 patient without previous EBRT were treated between 1996 - 2000 in the age of 37 -85 years (mean 59 years). For 11 patients it was the second or third local recurrence. The mean previous EBRT dose was 58 Gy (range 42 - 62 Gy) and the mean EBRT- BT interval was 42 months. Local recurrence was resected and the tumor bed was marked with surgical clips. Mean 7 plastic tubes were implanted to the target during the surgery. After CT based 3D inverse BT planning a mean dose of 29 Gy (10 -40 Gy) was applied to the target shaped reference isodose. Two patients received additional EBRT (40 and 50 Gy).

Results: After a mean follow up of 12 months (range 1-33 months) we observed 7 out of 14 patients without signs of local progress or recurrence. Seven patients had a local recurrence or progress after a mean interval of 6 months (range1-18 months). However, in 8 out of 14 cases we observed later a systemic progress. No RTOG III or IV side effects were developed. All 7 patients with a local control have a good cosmesis.

Conclusions: For patients with local recurrences in previous irradiated field salvage peroperative Brachytherapy seems to be offering a meaningful chance for local control and/or better quality of life.

Metastatic breast cancer

691 POSTER

Health-related quality of life (HRQL) in women with HER2-positive metastatic breast cancer: effect of treatment with trastuzumab (Herceptin) plus chemotherapy versus chemotherapy alone

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Purpose: The addition of Herceptin (H) to chemotherapy (CT) produces significant benefits in women with HER2-positive metastatic breast cancer (MBC), including a survival advantage (Slamon DJ et al, NEJM 2001;344:783). We have reported previously that HRQL is stable in women treated with H monotherapy and improves in those who respond (Cobleigh MA et al. JCO 1999;17:2639). HRQL generally worsens in women treated with CT. We have compared HRQL in patients with HER2-positive MBC treated with H+CT or CT alone in a pivotal phase III trial.

Methods: The pivotal trial included 469 patients, of whom 400 completed an HRQL questionnaire (EORTC QLQ-C30) at baseline and on one or more subsequent occasions at 8, 20, 32, 44 and 56 weeks. These 400 patients had been randomized to receive either H+CT (208 pts) or CT alone (192 pts). CT consisted of either doxorubicin (epirubicin in 36 women) and cyclophosphamide or paclitaxel. HRQL improvement or worsening were defined as a >/=10 change in scores (range 0-100) from baseline in each of 6 preselected domains: global QL, physical, role, social, and emotional functioning, and fatigue. Changes of <10 were defined as stable HRQL.

Results: Baseline scores were similar in the H+CT and CT groups. At 32 weeks, global QL, physical functioning and fatigue showed statistically significant improvement ($P<0.05$) over baseline scores in the H+CT group. In contrast, scores in these domains deteriorated in the CT group. Statistically significantly higher proportions of patients in the H+CT group reported improvement in global QL (51 vs. 36%, p=0.003) and in fatigue (52 vs. 42%, p=0.03) than in the CT alone group. Higher proportions of patients in the H+CT group also reported improvement in physical (37 vs. 29%, p=0.08) and role functioning (29 vs. 21%, P=0.08), but these were not statistically significant. Interestingly, the proportions of patients in the two groups that reported worsening were similar, but significantly fewer patients in the H+CT than in the C group had stable scores for global QL (9 vs. 21%, P=0.0003) and social functioning (11 vs. 19%, P=0.03).

Conclusions: The addition of H to CT did not cause the proportion of patients reporting worsening HRQL to increase. In contrast, significantly more patients experienced improvements in global QL and fatigue when treated with H+CT than when treated with CT alone. (Supported by Genentech, Inc.)

692 POSTER

Older (age >60 years) patients obtain survival benefit from herceptin plus chemotherapy

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Background: Entry to the pivotal phase III trial that demonstrated that adding Herceptin (H) to chemotherapy (C) (doxorubicin/epirubicin and cyclophosphamide [AC] or paclitaxel [T]) as first-line therapy for HER2-positive metastatic breast cancer (MBC) improves response rate (RR) (50% versus 38%, p=0.003) and survival (odds ratio, 0.80, p=0.046) was not restricted by age. Methods: We conducted a retrospective exploratory analysis to determine the influence of age on clinical benefit from H in this trial. Results: Of the 469 patients enrolled in the pivotal phase III trial, 360 (77%) were aged <60 years and 109 (23%) >60 years. Although baseline patient characteristics were similar between the 2 groups, patients aged >60 years had a worse baseline Karnofsky Performance Status (score <80, 41% vs 30%), higher initial nodal burden (>4, 52% vs 34%), longer disease-free interval from adjuvant therapy (26 vs 20 months), more frequent prior exposure to hormonal therapy (71% vs. 54%), and less frequent adjuvant exposure to anthracyclines (31% vs. 40%). Outcomes are shown below.

Response rate (<60 years): C alone, 33%; H + C, 52%
Response rate (>60 years): C alone, 28%; H + C, 44%
Survival (<60 years): C alone, 23 months; H + C 26 months
Survival (>60 years): C alone, 24 months; H + C 19 months

The survival benefit obtained by adding H to C in patients aged >60 years was statistically significant (odds ratio: 0.64 95% CI: 0.41-0.99).