Conclusions: Compared with fIMRT, IMRT plans resulted in more PTV coverage ,conformity index and uniform dose distribution, with comparable sparing of lung,heart and contralateral breast.

5038 POSTER

Bilateral Breast Cancer: Review of Literature With Focus on the Role of Radiotherapy After Breast Conserving Surgery

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Objective: Despite the recent increase in interest in bilateral breast cancer (BBC) research, this topic continues to raise several striking questions. At one level; it remains unknown whether BBC represents increased susceptibility to cancer or simply a second occurrence of a breast primary. In like manner, there are scant information on the appropriate management alternatives and technical aspects of radiotherapy delivery in these patients. Herein, we present a detailed report addressing bilateral breast cancer with focus on the role and technique of radiotherapy after breast conserving surgery.
Methods: Review of relevant literature addressing bilateral breast cancer with special focus to the role and technique of radiotherapy after breast conserving surgery. We performed an exhaustive MIDLINE database search using the following keywords; "bilateral", "breast cancer", "breast conservation surgery" and "radiotherapy".
Results: The time interval used to differentiate synchronous from metachronous cancer varies widely, however, 6 months is most frequently used. The estimated incidence of metachronous breast cancer ranges from 0.1 to 1%. Risk factors for BBC include strong family history, lobular histology and sedentary lifestyle. A diagnosis of BBC carries a twofold increase in disease-specific mortality over patients with unilateral breast cancer. Breast conserving surgery followed by breast irradiation is an established treatment for patients with early-stage BBC. The rate of locoregional recurrence does not appear to be higher than in patients with unilateral breast cancer. Radiotherapy delivery can prove difficult. On one hand, overlapping breast tangent fields should be avoided for fear of heightened skin reaction. On the other hand, maintenance of adequate radiation filed coverage is of paramount importance in an attempt to decrease the risk of locoregional recurrence.
Conclusions: This literature review represents a detailed report addressing bilateral breast cancer with special emphasis on the role of breast conserving surgery and the consequent need for bilateral breast irradiation. Numerous difficulties are encountered in radiotherapy delivery in these cases. As consequence, these patients are probably more appropriately managed at a tertiary care facility.

5039 POSTER

Thoracoscopic Internal Mammary Lymph Node Dissection: Diagnostic and Therapeutic Value

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Background: The role of IMN removal in breast cancer is still controversial. There is evidence that removal of IMN does not improve the survival of patients treated for breast carcinoma. The prognostic value of IMN status is high and a biopsy on a selected lymph node should be considered for staging.
Material and method 50 patients with operable breast cancer located in the central or medial quadrants or patients who had positive axillary lymph nodes were collected.
Patients underwent modified radical mastectomy or breast conservative surgery initially, then the skin incision of the MRM or that of ipsilateral axillary dissection of BCS were used to introduce 10 mm thoracoport into the pleural cavity at the midaxillary line in the 4th intercostals space. Artificial pneumothorax was achieved by allowing the air into the pleural space. 2 more 5 mm thoracoports were placed in the 3rd and 5th space anterior to midaxillary line. After parietal pleurotomy along the internal mammary vessels, disconnection of the internal mammary vessels just below the subclavian vein and at the 5th space was done. Then the internal mammary vessels, the surrounding fat, and associated IMNs were removed en-block.
Results: The mean age of patients was 44 years. 40 patients had central tumour, 10 patients had lateral tumour. 35 had clinically involved axillary nodes.
44 patients underwent MRM and 6 patients underwent BCS. No intra-operative complications occurred. Atelectasis was the only postoperative complication and was treated conservatively. The average chest drainage period was 1.2 day.
The frequency of IMN metastasis was significantly correlated with; the patient's age ($P = 0.03$), the site of the 1^{ry} tumour ($P = 0.03$), the size of the 1^{ry} tumour ($P = 0.05$), and the number of positive axillary LNs ($P = 0.001$).
As a result of histopathological analysis, all 18 IMN positive patients showed N migration. Stage migration occurred in 7 patients.
The median follow up period was 22 months. For the 18 patients with positive IMN, 5 developed metastasis and/or loco-regional recurrence, 2 died of breast cancer, while one patient died due to chemotherapy induce heart failure. For the 35 patients with negative IMN, 5 developed metastasis and/or loco-regional recurrence, 3 died of breast cancer. No patient had pleural dissemination or port-site metastasis.
Conclusion: Thoracoscopic IMN lymphadenectomy is a safe procedure that can be done with insignificant risk, without increasing morbidity, or any cosmetic compromise. Thoracoscopic IMN lymphadenectomy had inhibited those who had disregarded the status of the IMNs, by offering a clear diagnostic tool for metastasis.
On the other hand, it had satisfied those who supported IMNs dissection by offering a clear therapeutic tool for dealing with these metastases as well.

5040 POSTER

Is SLN Biopsy Alone a Therapeutic Tool in Breast Cancer?

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Background: In international and national guidelines, completion axillary lymph node dissection (ALND) still is the standard of care after a positive sentinel lymph node in breast cancer. However, developments in pathologic staging and the proven benefit of adjuvant therapy undermines the need for ALND in all patients. The purpose of this retrospective study was to evaluate disease free survival and recurrence in patients undergoing SLN biopsy alone versus SLN with ALND.
Materials and Methods: Patients with a positive SLN were identified from 2 hospital breast cancer databases. Locoregional recurrences and disease free survival were examined.
Results: We identified 488 patients with a positive sentinel node; 62 (12.7%) underwent SLN biopsy alone and 426 (87.1%) underwent SLN biopsy with ALND. The median follow up was 34 months. Patients were more likely to undergo SLN biopsy alone if they had a smaller metastasis size ($P < 0.05$).
In patients with isolated tumour cells and micrometastases there was no significant difference in disease free survival between the patients that underwent SLN biopsy alone compared to those with SLN and ALND. However, survival in patients with macrometastases was significantly worse in the group undergoing SLN biopsy alone compared to those undergoing SLN and ALND.
Conclusions: Axillary lymph node dissection should not be omitted in patients with macrometastatic disease in the sentinel node. Omission of ALND in patients with micrometastases or isolated tumour cells in the sentinel node seems to be a safe option and should therefore be discussed with patients.

5041 POSTER

Axillary and Supraclavicular Recurrences Are Rare After Axillary Lymph Node Dissection in Breast Cancer

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Background: Our aim was to evaluate the incidence of and risk factors for axillary recurrence (AR) and supraclavicular recurrence (SR) in breast cancer patients with axillary lymph node dissection.
Material and Methods: The study was based on 1180 patients with unilateral invasive breast cancer operated between January 2000 and December 2003. The median duration of follow-up was 84 months.
Results: The 7-year AR incidence was 0.7% and SR incidence was 1.3%. No risk factors for AR were identified. Patients with histological grade III tumours had a higher SR incidence (2.2%), than patients with grade II tumours (1.6%) and patients with grade I tumours (0%), $p = 0.031$. Patients with estrogen receptor positive tumours had a lower SR rate (0.9%), when compared with the 3.4% in patients with estrogen receptor negative tumours, $p = 0.009$. Also patients with progesterone receptor negative tumours had more often SRs (2.5%), than patients with progesterone receptor positive tumours (0.6%), $p = 0.003$. SR, but not AR, was an independent risk factor for poor breast cancer specific survival, HR 10.116, $p < 0.0001$.
Among N1 patients, the extent of radiotherapy (RT) had no influence on regional recurrences. Among N2 patients, the 7-year regional recurrence

rates were 34.3% in patients without RT, 0% in patients with local RT and 1.2% in patients with locoregional RT, $p < 0.0001$.
Conclusions: AR and SR are currently rare events and often detected concomitantly with distant metastases. SRs are associated with aggressive disease and poor survival. Regional RT significantly reduced regional recurrences in N2 patients but not in N1 patients.

5042 POSTER

Clinical Implications of Palliative Surgery in Patients With Suspicious Versus Proven Metastatic Breast Cancer Under Current Staging System

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Background: According to staging guidelines, patients are considered to have stage IV breast cancer if they have clinically or radiographically detectable metastases, with or without biopsy. However, this definition of distant metastasis could make the population of metastatic breast cancer heterogeneous. Though recent studies suggest that surgical removal of the primary tumour improved the prognosis of patients presenting with stage IV disease, these findings can be overestimated owing heterogeneity. Therefore, we classified stage IV breast cancer into suspicious metastatic breast cancer (SMBC) and metastatic breast cancer (MBC), and assessed the impact of palliative surgery on survival.
Methods: Among 2998 breast cancer patients treated at Seoul National University Hospital between January 2000 and February 2009, we consecutively enrolled 201 patients with newly diagnosed stage IV breast cancer. The patients were classified into SMBC and MBC groups; if they had detectable metastasis, which was confirmed either by biopsy, involvement in multiple organs or involvement in a single organ as shown by at least two different imaging modalities (CT, MRI and PET), they were considered to have MBC; all others were classified as SMBC group. The impact of palliative surgery on overall survival (OS) was evaluated by multivariate analysis.
Results: Among 201 patients, 66 were classified into the SMBC group and 135 into the MBC group. 65 of 66 patients (98%) in the SMBC group and 65 of 135 patients (48%) in the MBC group received palliative surgery during their treatment period. With a median follow-up time of 43 months, median OS for the SMBC group who received surgery was 7.0 years; median OS for the MBC group receiving surgery was 3.5 years and for the MBC group not receiving surgery 2.1 years ($p < 0.001$). The 5-year OS rates were 75.5%, 41.8%, and 16.2% respectively. Among the MBC group, palliative surgery appeared to be an independent prognostic factor for OS, adjusting for age, co-morbidity, hormonal receptor, HER-2 status, number of metastatic lesions and organs, use of systemic therapy (chemotherapy, hormonal therapy) and use of radiation therapy in multivariate Cox regression analysis (HR = 0.38; 95% CI 0.23–0.65).
Conclusion: The significant difference of OS in patients receiving surgery between SMBC and MBC group suggests that the current category of stage IV breast cancer includes a heterogeneous population. Interestingly, we also found that primary tumour resection in patients with MBC was associated with improved OS. Therefore, a more precise definition of stage IV breast cancer is necessary to define the population who can benefit from palliative surgery. A well-designed prospective study is necessary to assess the prognostic value of palliative surgery.

5043 POSTER

Positron Emission Tomography With Computed Tomography Scanning as a Predictor of Pathological Complete Response After Neoadjuvant Chemotherapy

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Background: To determine accuracy of preoperative positron emission tomography (PET) to detect residual disease after neoadjuvant treatment.
Material and Methods: Population included 33 patients after neoadjuvant treatment for local advanced breast cancer with axillary metastasis at time of diagnosis. Mammography, sonography, magnetic resonance (MRI), positron emission tomography (PET-CT) were performed. PET-CT considerations: Cuts: Coronal, sagital, transverse, Correction of atenuation: TAC 90 kV 165 mA, Radiotracer: 18F, FDG (Fluoro-desoxi-glucose), Dose: 7.81 mCi. Comparison between mammographic, sonographic, MRI and PET-CT findings and correlation with gold-standard (pathological report).
Results:
- Correlation with tumour size after neoadjuvant treatment: The most accurate tool for tumour assessment was PET-CT (p=n.s.).
- Percentage of unnecessary mastectomies (no residual tumour in pathological report in mastectomy specimen after chemotherapy) that could be avoided due to PET-CT= 24% ($p < 0.05$).
- Capability of PET-CT to predict tumour vitality: Tumour vitality was detected in 21 cases (95.4%).
- Prediction of tumour complete response to chemotherapy: Mammography: 20%, sonography: 60%, RMI in 40% and PET-CT in 84% ($p < 0.05$).

Conclusions:
- Tumour size: PET-CT alone can reach equal results as a combination of mamography, sonography and magnetic resonance.
- Tumour viability: PET-CT is the most reliable tool to predict tumour viability after chemotherapy.
- Pathological complete response: PET-CT predicts complete histological response in 80% of patients, better than other studies.

5044 POSTER

A Simple Risk Score to Predict the Presence of NSN Metastases in Breast Cancer Patients With a Positive Sentinel Node

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Background: Completion axillary lymph node dissection (ALND) remains the standard of care for patients with a positive sentinel lymph node (SLN). However, in 40−60% of patients the sentinel node is the only positive node. The aim was to develop a simple risk score to identify the patient's individual risk for non-sentinel node (NSN) metastases.
Materials and Methods: The risk score was developed on data of 182 breast cancer patients from one hospital, who underwent successful SLN biopsy and a completion axillary lymph node dissection, and was based on the predictive factors of NSN metastases, identified in a previous meta analysis. The risk score, consisting of pathological tumour size ($\leqslant$20 mm/ >20 mm), lymphovascular invasion (yes/ no), extracapsular extension (yes/ no), size of the SLN metastases ($\leqslant$2 mm/ >2 mm) and number of positive SLNs (1/ >1) was subsequently validated on an external population from another hospital (n = 180). A receiver operating characteristic (ROC) curve was drawn and the area under the curve was calculated to assess the discriminative ability of the nomogram. A calibration plot was drawn showing the actual versus the mean predicted probabilities for each interval.
Results: The area under the ROC curve was 0.78 (range 0.71- 0.85) in the original population and 0.78 (range 0.70–0.85) in the validation population. The risk score accurately predicted the low risk groups (<40%).
Conclusion: A simple risk score was successfully developed integrating just 5 clinicopathological variables to provide an individualized risk estimate of the likelihood of NSN metastases in breast cancer patients with a positive sentinel node. This risk score may assist in individual decision making regarding axillary lymph node dissection in sentinel node positive patients.

5045 POSTER

Outcomes of HER2+ Metastatic Breast Cancer (MBC) Patients (PTS) Treated With Continuous Inhibition of HER2 Activity: a Single Institution Study

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Background: Anti-HER2 therapies are effective in HER2+ breast cancer; even if resistance occurs, continued HER2 inhibition is required for antitumour effect. There are no definitive data on the clinical benefit of continued trastuzumab (T) beyond progression in MBC and the optimal duration of T in pts with long-term control of disease. This study explores outcomes of MBC pts treated with T in multiple sequential lines.
Methods: From 2001 to 2009 we evaluated OS and cardiac toxicity in 50 pts with HER2+ (ASCO/CAP criteria) MBC who received T-based therapy for $\geqslant$ 12 months. OS was measured from the beginning of T-based CT to the last follow up visit or death. Cardiac event was any decline in LVEF by >10% from baseline or drop to <50%, III/IV NYHA CHF, new onset angina myocardial infarction, significant arrhytmias or sudden cardiac death.