

with bone metastasis do not have pain and are asymptomatic. This is the first study that assesses the pattern of disease and outcome of breast cancer patients with asymptomatic bone metastasis.

Material and Methods: We did a retrospective study of all breast cancer patients with asymptomatic bone metastasis from January 2009 to December 2010. The inclusion criteria were females with breast cancer with bone scan or PET scan positive for bone metastasis. All patients were completely asymptomatic with respect to bone metastasis. In all 70 patients were analysed. In each case the decision for treating patients with systemic therapy/radiotherapy/bisphosphonates was taken by the Joint Clinic/Radiation Oncologist at the hospital. In general radiotherapy was given only when the involved area was weight bearing areas/with gross bony involvement.

Results: Out of 70 patients, 38(54.3%) were post menopausal. 44(62.9%) patients had bone metastasis at presentation while 26(37.1%) had these at some stage of their follow up for radically treated breast cancer. 36(51.4%) patients had a single site of bone metastasis while the rest had multiple sites of involvement. 44(62.9%) patients had ER and/or PR receptor positivity. Overall, bone metastasis were detected by bone scan in 57 (87.4%), PET scan in 11 (15.7%) and CT scan 2(2.9%). There was no other site of metastasis in 47(67.1%) while the rest of the patients had other site of metastasis including liver 8(11.4%), lung 11(15.7%) or multiple 4(5.8%). Only 8(11.4%) patients received immediate RT, while delayed radiotherapy had to be given in 12(17.1%). No radiotherapy was given in 49(70%) patients till last follow up. Overall, at median follow up of 8 months, only 16(22.9%) patients became symptomatic for their bone metastasis. 75 patients received some form of systemic chemotherapy during their overall course. At last follow up 63(90%) were alive.

Conclusion: The baseline clinical and pathological features of breast cancer patients with asymptomatic bone metastasis have been presented. Patients with asymptomatic bone metastasis are a favourable subgroup. Further prospective and randomised trials would confirm our findings and establish the optimal treatment in such patients.

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POSTER

Quality Indicators Used to Measure Adherence to Standards of Breast Cancer Care – a Single Institutional Study From Ukraine

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Background: Data of the Ukrainian National Cancer Registry were analyzed for purpose to evaluate the quality of operable breast cancer care in a tertiary care institution. Quality Indicators has been proven to detect breast cancer at an early stage and, when followed up with appropriate diagnosis and treatment, to reduce mortality from breast cancer as well as improvement of survivorship, over time. The purpose of this systematic research was to survey the range of measures assessing the quality of breast cancer care in women and to characterize specific parameters potentially affecting their suitability for wider use in Ukraine.

Material and Methods: Quality Indicators were based on an international consensus and review of 143 Indicators that have been developed by the University of Ottawa Evidence-based Practice Center for the Agency for Healthcare Research and Quality. Twenty-six quality indicators: 5 structure-related, 16 relating to process (6 diagnosis-related and 10 treatment-related indicators) and 5 outcome-related (e.g., quality of life) were used to measure the quality of care in 1461 breast cancer patients treated from 2000 to 2005. Data were abstracted from the charts of these patients. Adherence to each indicator was based on the number of procedures performed divided by the number of patients eligible for that procedure. This research explores whether 100% adherence to a set of quality indicators applied to individuals with breast cancer is associated with better survival, and was done in Ukraine the first time. The main analysis of adherence was dichotomous (ie, 100% adherence vs. <100% adherence). The outcome measures studied were 5-year overall survival and progression-free survival, calculated using the Kaplan–Meier method. The Cox's proportional hazard regression model was used for univariate and multivariate analyses.

Results: Most patients received care that demonstrated good adherence to the quality indicators. Multivariate analysis revealed that 100% adherence to entire set of quality indicators was significantly associated with better overall survival [hazard ratio (HR): 0.46; 95% confidence interval (CI): 0.34–0.63] and progression-free survival (HR 0.51; 95% CI, 0.39–0.68). One hundred percent adherence to treatment indicators alone was also associated with statistically significant improvements in overall and progression-free survivals.

Conclusions: Our study strongly supports that 100% adherence to evidence supported quality of care indicators is associated with better survival rates for breast cancer patients and should be a priority for practitioners. Our study demonstrated that the quality of breast cancer care

in this institution was below the accepted international standards. However, this study may be used to make interventions for improvement of quality in similar institutions all over the Ukraine.

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POSTER

Clinical and Pathological Prognostic Characteristic of Breast Cancer Patients With Brain Metastases

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Successful improvement in breast cancer patient's treatment leads to life prolongation. This is connected with rising incidence of brain metastases (BM) which occurs in up to one third of patients with metastatic breast cancer. The aim of this study is to analyze clinical and pathological factors in patients with BM.

This is a retrospective study of 247 breast cancer patients with brain metastases, treated with brain radiotherapy between 2005–2009 at two Cancer Centres, Gliwice, Krakow. Previously we presented data from patients treated between 2005–2007.

Patient's age at time of diagnosis ranged from 25 to 80 years, average 51 years. Patients' stages at time of cancer diagnosis were: T1–2: 38%, T3–4: 42%, N0–1: 54%, N2–3: 27%.

Majority of patients were treated primary with radical intent 81%. Most of patients underwent radical mastectomy 74% or breast conserving therapy 6%. Ductal invasive carcinoma was the predominant histology accounts for 65%. Lymph nodes metastases were present in 45% of patients with median lymph nodes ratio 17%. Tumours were ER, Pr receptor positive only in 31% and 26%, and only 13% for ER and 10% PR were highly positive. We are able to establish HER2 status in 54% of patients and in 22% HER2 was negative, and highly positive in 19%.

All patients were treated with radiotherapy, 58% underwent whole brain radiotherapy, 19% underwent metastasectomy, 36% stereotactic irradiation, in combination with WBRT 18% or alone 8%. Median time from diagnosis to BM was 2.8 years (range 0–21), to distant relapse 2.1 or local relapse 2.6. Single Bm was diagnosed in 28%, and multiple metastases in 32% of patients, remaining had 2–7 lesions.

Median time from treatment dissemination to brain relapse was 0.24 years. Median time to BM was 2.9 years. Median time to BM was longer in ER+ patients 3.8 years vs ER– patients 2.3, and PR+ patients 3.7 years vs PR– patients 2.3. A median time to BM shortened with T stage and N stage.

Advanced stages, ER–, PR–, are related to higher risk of BM. Major cause of death was brain metastases, therefore further studies are needed for early BM patients selection.

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POSTER

A Dosimetric Comparison of Inverse Intensity-modulated Radiotherapy and Forward Intensity-modulated Radiotherapy for Breast Cancer After Radical Mastectomy

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Background: To evaluate the dose distribution of target volume and normal tissues in forward intensity modulated radiotherapy (f-IMRT) and inverse intensity modulated radiotherapy (IMRT) planning for breast cancer after radical mastectomy.

Materials and Methods: Ten patients with breast cancer who received radical mastectomy were enrolled in this study. On each patient's CT images the supraclavicular, chest wall and internal mammary areas were delineated. fIMRT and IMRT plans were performed for each patient. The prescription dose was 50 Gy in 25 fractions. fIMRT plans for the supraclavicular and the chest wall area using 6 MV X-ray irradiation, internal mammary area with 9–12 MeV electron irradiation, according to the three regions of dose adjust the doses of cold and hot fit. IMRT plans were take supraclavicular, chest wall and internal mammary area as a whole target, using 6 MV X-ray, performing inverse optimal design. The dose distribution of target volume and normal tissues, conformal index (CI), and heterogeneous index (HI) were analyzed using the dose-volume histogram (DVH) for the two intensity modulated modes.

Results: The maximum dose of PTV in IMRT plan was lower than that of f-IMRT plan ($t = -3.23$, $P < 0.05$), the minimum dose and $V_{95\%}$ of PTV were higher than that of f-IMRT plan ($t = 4.08$, -2.69 , $P < 0.05$). About CI and HI, IMRT plan were better than f-IMRT plan ($t = -3.13$, 2.74 , $P < 0.05$). The differences of V_{10} , V_{20} , V_{25} , V_{30} and D_{mean} of ipsilateral lung were not statistically significant. However, the V_{15} of ipsilateral lung in IMRT was 4.2% less than that in f-IMRT, which was statistically significant ($t = 3.2$, $P < 0.05$). There was no significant difference in D_{mean} and V_{30} of heart, D_{mean} of contralateral lung and contralateral breast between two modes.

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.

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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 field 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.

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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 1st tumour ($P = 0.03$), the size of the 1st 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.

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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.

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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