prospectively compare magnetic resonance imaging (MRI) response with pathological response assessment in patients completing neoadjuvant chemotherapy. We evaluated whether MRI can be used as a tool for determining the type of surgery. We tried to identify subgroups based on initial core needle biopsy that would benefit from MRI to predict pathological response.

**Materials and Methods:** MRI was performed before, during and after neoadjuvant chemotherapy (4 cycles of doxorubicin plus cyclophosphamide followed by 4 cycles of docetaxel) in 55 women with locally advanced breast cancer ineligible for primary breast conservative surgery. We compared tumour size on MRI after completing chemotherapy with final histopathological findings. MRI response was correlated with the type of surgery performed (mastectomy versus breast conservative surgery).

**Results:** Based on MRI, there were 14 non-responders (NR), 20 patients with partial response (PR) and 16 patients with a complete response (CR). Diagnostic accuracy for assigning patients to the NR group was 84%. In 75% of patients with partial response MRI proved to be reliable in determining incomplete pathological response. In 50% of patients in the CR group, histology revealed residual tumour. Mastectomy in the NR group was performed in 100% of the cases, in 50% of the PR group and in 18% of the complete responders. When analysing for biological markers on initial biopsy (tumour type, hormonal receptor and neu oncogen status) no subgroup was identified to benefit from MRI in predicting pathologic response.

**Conclusions:** In the NR group, MRI response correlates well with pathologic findings. In our view, mastectomy is indicated in this group of patients. MRI overestimates complete response in half of the patients. Therefore surgery after neoadjuvant chemotherapy remains obligatory to determine complete pathological response.

**37** Poster

**Incidental breast lesions found on computer tomography – what is their significance?**

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**Background:** The detection of incidental breast lesions on CT imaging is not uncommon and often results in referral for breast assessment. The aims of this study were twofold: to establish the rate of occult breast cancer detection by CT and to see if standardised analysis of lesion morphology and enhancement can predict malignancy.

**Material and Methods:** A retrospective review of 268 179 CTs at performed our institution between 19/03/1994 and 15/11/2007 yielded 392 radiology reports containing the keyword 'breast'. 56 of these patients had no current or previous history of breast cancer and were thus referred to the Cambridge Breast Unit (CBU) for standard triple assessment of the lesion seen on CT. The CT images were retrospectively reviewed by two experienced breast radiologists. Lesion morphology was analysed using the BI-RADS mammography template and enhancement characteristics using the MRI templates. The radiologists were blinded to the results and outcome of formal breast assessment.

**Results:** The overall malignancy rate (B5) was 30.3% (17 of 56 patients) with the most common malignancy being invasive ductal carcinoma (12 of 56 patients). 28 patients had an ultrasound guided biopsy and 28 did not need biopsy as they were deemed normal or benign following clinical and imaging (mammography and/or ultrasound) assessment. Positive predictive values (PPVs) for malignancy were obtained for each of the CT descriptive terms derived from BI-RADS.The term "spiculate" had a PPV for malignancy of 0.73 and "irregularity" a PPV of 0.57. Descriptors with low PPV for malignancy eg: "oval" (PPV 0.00), "round" (PPV 0.14) and "circumscribed" (PPV 0.00) were associated with benign lesions or normal breast tissue. The contrast enhancement characteristics of lesions will be described.

**Conclusion:** In our experience, occult breast cancer was found in 30% of patients referred for assessment following the detection of an incidental lesion on CT. Accurate analysis of such lesions using standardised descriptors may help in differentiating potentially benign from malignant lesions and therefore help clinicians in further management and appropriate referral.

**38** Poster

**Evaluation of a RT-PCR based routine screening tool for the detection of disseminated epithelial cells in the bone marrow of breast cancer patients**

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**Background:** Detection of disseminated tumor cells in bone marrow of breast cancer patients is an independent prognostic factor. The gold standard for the detection of disseminated tumor cells (DTCs) is immunocytochemistry (ICC). The aim of our investigation was to evaluate a newly established RT-PCR based assay and compare both techniques with respect to their sensitivities on the basis of 405 bone marrow aspirates from BC patients. 331 of all samples were obtained at the time of surgery for primary breast cancer. 55 patients with no evidence of the disease underwent secondary BM biopsy and 19 presented with a relapse at the time of BM aspiration.

**Materials and Methods:** 405 bone marrow aspirates from breast cancer patients were processed with both methods.

*Immunocytochemistry*: After Ficoll enrichment of 10ml bone marrow, cytospins were prepared and stained using the A45-B/B3 primary antibody for pCK. Cytospins were analyzed using the ACIS system (Chromavision) according to the ISHAGE evaluation criteria.

*RT-PCR*: mRNA was extracted and purified using the mRNA isolation for blood and bone marrow kit (Roche® Molecular Biochemicals). RT-PCR was performed on the LightCycler® system, using the RNAMaster Hybridization Probes kit and custom primers and probes. Primers were selected to amplify a 380bp fragment of the CK19 gene.

Positive and negative controls were included with each batch of samples for both procedures.

**Results:** Altogether, in 48% (196 out of 405) of the aspirates, at least one method detected disseminated tumor cells. Highly significant correlation between ICC and RT-PCR results was observed ($p < 0.01$). However, in 111 patients discordant results were found. 57 BM aspirates were positive by RT-PCR but negative by ICC whereas 54 samples were positive only by ICC. The positivity rates of ICC and RT-PCR were 34% and 35%, respectively. The highest combined (obtained by at least one method) positivity rate was observed in the subgroup of patients with relapse of the disease at the time of BM aspiration (74%), followed by primary cancer patients (51%), the lowest in patients with no evidence of the disease (27%).

**Conclusions:** Immunocytochemistry is the current gold standard with well-known correlation to the prognosis. However, it is observer-dependent and labor intensive. RT-PCR is time-efficient and may increase the sensitivity but it lacks a standard protocol. We conclude that RT-PCR-based assays have a potential to improve diagnostics in this field.

**39** Poster

**Screening for metastatic disease in newly diagnosed breast cancer patients**

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**Background:** Radiologic tests as bone scan (BS), chest radiography (CRX) and liver ultrasonography (LUS)) are commonly used as part of baseline staging of newly diagnosed breast cancers. However, in the absence of symptomatic disease, the usefulness of this routine diagnostic work-up is not evidence-based. So they may be overused.

The objective was to determine the yield of these radiologic tests in this population.

**Materials and Methods:** We evaluated 70 asymptomatic patients with newly diagnosed invasive breast cancer underwent an evaluation programme including CRX, LUS and BS. When metastatic disease was found, the suspicion was confirmed by other tests (bone X-ray, computerized tomography scan, magnetic resonance imaging) in order to identify true positive diagnoses.

**Results:** 10% of patients had pathologic tests. 4 out of 7 patients were correctly diagnosed by the initial staging investigations as having metastatic disease (true positive cases). BS detected true skeletal metastases in 4.2% of patients, CRX detected true lung metastases in 1.4% and in one in two suspicious CRX, two in two LUS and 0 out of 3 suspected BS were concluded false positive in terms of metastatic disease. Before imaging tests, all patients with BS evidence of metastases were previously classified as having stage III-B disease. The screening programme disclosed 5.7% of distant metastasis but due to false positive findings, 4.2% patients had to live with the psychological distress of suspected metastatic disease.

**Conclusion:** In newly invasive breast cancer patients without clinical signs of tumor spread baseline screening for metastases is not warranted because of low frequency of metastases and false positive findings.