breast tumors as a consequence of random variations in the measurements of tumor size.

**Materials and Methods:** Unidimensional measurements (largest diameter, RECIST) and bidimensional measurements (product of largest diameter and its perpendicular, WHO) of tumor extent were performed on 159 lesions in breast cancer patients, using mammography, ultrasonography, and MRI. The random variations in these measurements were quantified using an analysis of variance technique, and were used to predict the fraction of false-positive calls for tumor regression and the fraction of false-positive tumor progressions that result from employing the WHO and the RECIST guidelines for monitoring tumor response to neoadjuvant treatment.

**Results:** Using the WHO criteria, the estimated fraction of false-positive calls for tumor regression is 13% (mammography), 10% (ultrasonography), and 13% (MRI). For tumor progression, the estimated fraction of false-positive calls is 29% (mammography), 26% (ultrasonography), and 28% (MRI). Employing the RECIST criteria results in an estimated fraction of false-positive calls for tumor regression of 13% (mammography), 12% (ultrasonography), and 11% (MRI). For tumor progression, the estimated fraction of false-positive calls is 23% (mammography), 22% (ultrasonography), and 19% (MRI).

**Conclusions:** Both the WHO and the RECIST guidelines overestimate tumor regression and tumor progression. In particular, tumor progression may be considerably overestimated, although somewhat less by the RECIST than by the WHO guidelines. If a lower fraction of false-positive calls is desired in monitoring the response of solid breast tumors to neoadjuvant treatment, the criteria may need to be refined using quantitative knowledge of the reproducibility in the measurements of tumor extent.

**128** POSTER

**Six-year experience of equivocal (B3) and suspicious (B4) breast core biopsies from screen-detected lesions: correlation with radiology, cytology and final excision**

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**Background:** To review our experience with equivocal and suspicious results on breast core needle biopsies (CNB) from screen-detected lesions between 01/07/1997 and 30/06/03.

**Methods:** The data were extracted from the National Health Service Breast Screening Programme (NHSBSP) screening office computer, cytology files and histopathology database. Radiology, Fine Needle Aspiration Cytology (FNAC) and CNB were reported according to the guidelines of the NHSBSP. B3/B4 CNBs were correlated with pre-operative Radiological and FNAC findings and subsequent pathology excision results.

**Results**: During the study period, 915 CNBs were received from screen-detected lesions. 70 (7.7%) were reported B3 and 40 (4.4%) were reported B4. 109/110 of the B3/B4 CNBs had concurrent FNAC. The radiological risk score was available for all 110 cases. 103/110 (93.6%) had excision biopsy (all histology reports available); the remaining 7 patients have radiological follow-up available for a mean of 45 months (range 12–75). The Positive Predictive Value for malignant histology on excision (PPV) of B4 was 87.5% and the PPV of B3 was 36%.

All B4 cases were excised and the 5 benign B4 CNB were derived from atypical ductal hyperplasia (ADH). The 38 cases with B3 CNB and a benign excision biopsy included ADH (6), radial scar/complex sclerosing lesion (18), atypical lobular hyperplasia (1), granular cell tumour (1), myofibroblastoma (1), Phyllodes tumour (1), papilloma (3), fibrocystic change (3), fibroadenoma (1), sclerosing adenosis (1), pseudoangiomatous stromal hyperplasia (1), and normal breast tissue (1).

During the study period, 2615 FNAC were performed on screen-detected lesions. FNAC statistics of this cohort of FNAC indicate a 59% absolute sensitivity for FNAC with a PPV of 99.8% for C5 cytology and 85.3% for C4 cytology. We had no C5 FNAC among the 25 cancers with B3 CNB. Only 14 of the 35 cancers with B4 CNB had a C5 FNAC.

**Conclusions:** There have been fears that the B3 category may lead to an increase in the benign biopsy rate, but our data support excision of lesions with B3 at CNB. There are no Mammotome biopsies in this study but this may be a viable second line of investigation. We speculate that cancers with a B3 or B4 CNB may be a sub-group in which it is difficult to obtain a pre-operative diagnosis by any diagnostic modality as the FNAC results in this subset are at variance with our overall cytology results. Excision is mandatory for any case with a B4 diagnosis.

**129** POSTER

**Breast duct micro-endoscopy does not diagnose pre-invasive malignancy**

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**Introduction:** We have previously demonstrated the feasibility of breast duct micro-endoscopy. We describe the early results of this technique when used to investigate nipple discharge.

**Procedure:** Duct endoscopy was carried out using micro endoscopes between 0.5 mm and 1.1 mm external diameter. (Polydiagnost GmbH). For the first time a micro-cytology brush was used to obtain samples in addition to duct aspirates.

**Results:** 28 patients were investigated, 20 had unilateral single duct discharge (16/20 bloodstained), and 8 unilateral multi-duct discharge (3/8 bloodstained). 12 cases were carried out under local anaesthesia. Good visualisation of the discharging ducts was achieved in 100% of cases to a maximum depth of 7.5 cm, (median depth 5.2 cm). A maximum of 8 duct bifurcations (median 3) were crossed during the examinations. We identified pathology in 15 patients (single papilloma in 6, multiple papilloma in 2, duct adhesions 2, inflammation in 5, obstructed duct in 2, foreign body in 1). 2 patients also had nipple aspirate cytology examined and 1 of these yielded cells. 4 had cytology by micro-brush, and 3 provided sufficient cells for analysis. All cases subsequently underwent excisional surgery. The findings on endoscopy were in agreement with the pathology in 20 cases. Endoscopy failed to diagnose papillomas in 4 cases where the lesions were in adjacent, non-discharging ducts. In 1 case multiple papillomas were seen but histology suggested that these were polypoid granulomas. Cytology (aspirate) showed papillary fragments. Cytology was in agreement with the histology in 3/4 cases. However, DCIS was diagnosed on histology in one case, DCIS/LCIS in one case and ADH in another. None of these 3 cases had visible macroscopic abnormalities within the discharging duct on endoscopy. Cytology was available in 1 of these patients (aspirate and micro-brush) but this provided insufficient cells for diagnosis (C1).

**Conclusion:** Breast duct micro-endoscopy provides clear pictures of the discharging ducts to a greater depth than would usually removed at surgery. Papillomas in adjacent ducts can be missed but these are probably not contributing to the discharge. In this small series breast duct micro-endoscopy on its own is not sufficient to diagnose pre-invasive malignancy.

**130** POSTER

**The role of axillary nodal staging during preoperative breast diagnostics**

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The ultrasonographic work-up of the axilla is part of the examination of the breast. This permits an imaging assessment of axillary nodal status and offers guidance for fine needle aspiration (FNA) of visualized lymph nodes (LNs). The presence and demonstration of metastatic LNs obviates the need for sentinel lymph node (SLN) biopsy even in the event of non-palpable axillary LNs.

During a period of 6 months, there were 64 patients who had axillary FNA cytology (FNAC) from enlarged LNs. LNs were categorised either as reactive or pathological by ultrasound (US). LNs were classified as pathological if they had an even or uneven enlargement of the cortical area, had a central area that had become hypoechogenic, or had become rounded. US-guided sampling was done from the cortical area of the LNs.

Of the 37 cases categorised as pathological by US, FNAC was reported as inadequate in 5, and as negative for metastasis in 8. Eleven patients had no axillary surgery either because of primary chemotherapy or because of negative breast imaging findings and FNAC of the axillary LN, whereas 26 patients had either diagnostic excision of the LN, or SLN biopsy or axillary dissection; 21 had metastatic disease in the axilla, 2 had nodal involvement by lymphoma, 1 had tuberculous lymphadenitis, and 2 patients had no relevant nodal pathology. Three inadequate and 3 negative FNAC specimens were found to have metastasis in the axilla; the tuberculous lesion and one of the lymphomas were reported as inadequate and negative, respectively. Of the 27 cases categorized as reactive by US, 8 were reported as inadequate, 1 as metastatic and the remaining as non metastatic by FNAC. Eleven patients had some type of axillary surgery, 8 had metastatic nodal involvement, and 1 had nodal involvement by a lymphoma. The sensitivity and specificity of axillary US to detect metastatic