detected cases with micrometastases with tumours ⩾10 mm, metastatic axillary nodes were found in 17/75 (23%).

In an independent cohort from Helsingborg hospital including 173 primary breast cancer patients, 14 of them had micrometastases in the sentinel node biopsy. Screening detected cancers constituted 8 of them, whereas 6 were clinically detected. None of the screening detected cancers had non-sentinel node metastases in the axilla in contrast to the clinically detected cases where 3/6 patients had metastatic non-sentinel nodes.

Conclusion: Despite the small number of cases with micrometastases in this large cohort of breast cancer patients, these results favour that completion axillary dissection can safely be avoided in screening detected breast cancer cases with micrometastases in sentinel nodes. The finding is not explained by smaller tumour size in screening detected patients.

103 Poster

Avoiding Frozen Sections of Sentinel Nodes in Breast Cancer Patients. Is it Possible by Using Preoperatively Known Characteristics of the Patient?

D. Grabau[1], L. Dihge[2], M. Fernö[3], C. Ingvar[2], L. Rydén[2]. [1]*Department of Clinical Sciences Oncology, Pathology, Lund, Sweden;* [2]*Department of Clinical Sciences Surgery, Surgery, Lund, Sweden;* [3]*Department of Clinical Sciences Oncology, Oncology, Lund, Sweden*

Background: Avoiding frozen sections of sentinel nodes will save time in the operative theatre. Due to false negative frozen sections about 10% of women receiving sentinel node biopsy will need a second operation in the axilla after the definitive pathological report.

Purpose: To find a subgroup of women offered sentinel node biopsy where the risk of non-sentinel node metastases is 10% or less. Only preoperatively identified data was considered.

Material: All consecutive women offered sentinel node biopsy with frozen sections in combination with breast surgery at the Skåne University Hospital, Lund, during 2009–2010.

Methods: Sentinel nodes were classified into node negative (including patients harbouring isolated tumour cells), containing micrometastases measuring 0.2−2.0 mm or having macrometastases of more than 2.0 mm. Preoperative data was extracted from individual files: Age, screening status, BMI, results of cytology and/or needle core biopsy and tumour size on mammography and ultrasound.

Results: Sentinel node biopsy was offered to 477 women. Of these 419 (88%) had invasive carcinoma, 49 (10%) had ductal carcinoma in situ and 9 (2%) had benign conditions.

Age: Women of 75 years or more had metastases in 41% (33/81) and no low risk group could be found.

Screening: In the screening population 40−74 years 285 of 386 (74%) cases was screening detected and of these 80 (28%) had metastases in the sentinel node.

Preoperative diagnosis on biopsies: A preoperative diagnosis of ductal carcinoma in situ on needle core biopsy was found in 25 (5%) cases of which none had sentinel node metastases. Result of the fine needle aspiration or needle core biopsy was normal or with atypia in 31 (7%) women of which 2 (6%) had metastases in the sentinel nodes.

BMI: About half of the patients had BMI above 25 and metastases appeared with the same frequency irrespective of BMI.

Radiologic tumour size: Radiologic tumour size of 10 mm or less appeared in 173 patients. Two of 17 (12%) cases with radiologic tumour size of 5 mm or smaller had metastases and 43 of 156 (28%) cases with radiologic tumour size >5 mm and ⩽10 mm Of the 173 patients with radiologic tumour size of ⩽10 mm, only 73 (42%) had a corresponding histopathological tumour size of ⩽10 mm.

Conclusion: Frozen sections of sentinel nodes in breast surgery can only be safely avoided in 12% of the patients with either a diagnosis of benign, atypia or ductal carcinoma in situ on needle core biopsies or fine needle aspirations.

104 Poster

The Ultrasound Images of Ductal Carcinoma in Situ − Frequency of Non-mass Abnormalities

K. Tanaka[1], K. Takahashi[1], A. Ogiya[1], Y. Tadokoro[1], N. Nishikawa[1], M. Sato[1], Y. Kubo[1], K. Nanri[2], T. Uematsu[2], M. Kasami[3]. [1]*Shizuoka Cancer Center, Department of Breast Surgery, Shizuoka, Japan;* [2]*Shizuoka Cancer Center, Department of Clinical Physiology, Shizuoka, Japan;* [3]*Shizuoka Cancer Center, Department of Diagnostic Pathology, Shizuoka, Japan*

Background: Although many believe that the usefulness of ultrasound is limited in ductal carcinoma in situ (DCIS), ultrasound has been found to be useful in some DCIS cases, and, recent ultrasound equipment provides better images. According to the ultrasound breast imaging guidelines of the Japan Association of Breast and Thyroid Sonology (JABTS), ultrasound images of DCIS are classified into 'mass' and 'non-mass' abnormalities. Mass abnormalities are classified into two types: (1) solid tumors; and (2) intracystic tumors. Four types of non-mass abnormalities have been proposed after long deliberation: (1) hypoechoic areas within mammary glands; (2) abnormalities of the ducts; (3) clustered microcysts; and (4) architectural distortions. In order to evaluate and improve the JABTS guidelines, we studied the frequency of non-mass abnormalities observed by ultrasound in DCIS cases.

Material and Methods: Ultrasound reports of all DCIS surgery cases at Sizuoka Cancer Center during 2008 and 2009 were classified according to the JABTS ultrasound breast imaging guidelines.

Results: Among the 75 DCIS cases, 71 showed ultrasound findings. Non-mass and mass abnormalities were reported with 56% (40/71) and 40% (28/71) of the cases, respectively. Four percent (3/71) of the cases showed only hyperechoic spots, suggesting calcifications. With non-mass cases, hypoechoic areas were observed in 53% (38/71) of the patients, and abnormalities of the ducts were seen in 3% (2/71) of the cases. Neither clustered microcysts nor architectural distortions appeared in any of the 71 cases. Among mass cases, 26% (18/71) showed solid tumors, and intracystic tumors were found in 14% (10/71) of the patients.

Conclusions: The most common ultrasound finding with DCIS cases was the presence of non-mass hypoechoic areas (56% of DCIS cases). However, it is difficult to provide an appropriate term for vague hypoechoic areas in mammary glands. Among the four types of non-mass abnormalities suggested in the JABTS guidelines, clustered microcysts and architectural distortions were very rare compared to the other two types. To improve the ultrasound breast imaging guidelines for DCIS cases, further investigation is needed. We are planning a multi-institutional study in the near future.

105 Poster

Do We Need to Biopsy Young Women with Clinically and Radiologically Benign Breast Lumps?

K. Goonetilleke[1], D. Vijayan[1], N. Sharma[1], K. Virdee[1], M. Sintler[2]. [1]*Walsall Hospital Nhs Trust, Surgery, Birmingham, United Kingdom;* [2]*Sandwell and Birmingham City Nhs Trust, Surgery, Birmingham, United Kingdom*

Background: Of all breast lumps in young women, very few are malignant. In women under 30 years breast cancer contributes to 0.39% of all cancers. Diagnostic assessment of patients with breast symptoms should be based on triple diagnostic method. However, some patients may not require all elements of triple assessment including those with clearly identified benign conditions with no other suspicious features identified clinically and radiologically. Women under 30 years undergo large number of fine needle aspiration (FNA) or core biopsy (CB) for benign breast disease. It is important to strike the correct balance between ensuring patient safety and optimising resource use.

Materials and Methods: Retrospective study of women under 30 years presenting with breast symptoms between December 2000 to January 2010, having a biopsy/ fine needle aspiration who had both ultrasonography and cytology data available at a University Teaching Hospital in Birmingham United Kingdom. The patient records were accessed on a computerised database. There clinic letters, imaging results and cytology were inspected manually.

Results: Total number of patients were 864. 612 had FNA and 252 CB. 544 met the requirement of having there imaging results in the database. There were 496 (U2), 39 (U3) and 9 (U3+) on ultrasonography. Of the 496 U2, 495 patients pathology was benign (B1/B2). All U3 patients pathology was confirmed as benign. All U3+ patients pathology confirmed cancer. The data table below gives a summary of all U3 (Uncertain ultrasonography) along with final pathology.

Overall there were 9 cases of U4/5 (Likely malignant) which all confirmed cancer on pathology. However there was 1 reported U2 which was reported as a C4(Cytology likely cancer).

Number	ClinicalDiagnosis	UltrasoundGrade	Biopsy grade
10	Benign mass	U3	B2
18	Fibroadenoma	U3	B2
1	Fibroadenoma	U3	Phylloides
2	Indeterminate	U3	B2
1	Indeterminate	Vascular mass	C2
2	Multiple lumps?benign	U3	B2
2	Nipple change	U3	B2
1	Mass increasing size	U3	B2
1	Thickened tissue	U3	C2
1	Silicone implant? lump	snow storm effect	silicone granuloma

Conclusions: The study corroborates the current Association of Breast Surgeons UK guidelines that women under the age of 25 years who clinically and radiologically have a benign breast lump (ie. Fibroadenoma, Fat necrosis, lipoma, harmatoma) they do not require needle biopsy. All 495 who behaved clinically and radiologically bening (P2/U2) in our study were proven to have benign disease on FNA/CB. This study shows the guidelines are valid up to 30 years. If there is a discrepency between clinical and radiological findings there should be a low threshold for biopsy. Otherwise it may be safe to opt out of needle biopsy as it avoids unnecessary morbidity and use of precious resources in terms of cost, man power and time.

106 Poster

Efficacy of One-Step Nucleic Acid Amplification (OSNA) for Intraoperative Diagnosis of Breast Cancer Metastases

T. Mizoo[1], T. Shien[1], T. Nogami[1], T. Iwamoto[1], T. Motoki[1], N. Taira[1], J. Matsuoka[1], H. Doihara[1]. *[1]Okayama University Hospital, Breast and Endocrine Surgery, Okayama, Japan*

Background: OSNA (One-step Nucleic Acid Amplification) is new useful examination modality to detect the sentinel lymph node metastases using CK19 mRNA. The efficacy and safety of OSNA is controversial. We analyzed the benefits and problems retrospectively.

Materials: From November 2009, we started to use OSNA. Initial 3 months, the sentinel lymph-node was divided into two sections right after resection, one side is examined by the OSNA method, the other side is examined by pathologists using intraoperative frozen section (H&E). The cases diagnosed node positive by OSNA and/or pathology added axillaly dissection. After this period, we examined whole sentinel lymph nodes by only the OSNA method. We analyzed differences between two methods retrospectively (accuracy and the time for examinations).

Result: For initial 3 months, 27 primary breast cancer cases (36 sentinel lymph nodes) were examined. The total positive nodes were 5. The positive rate of OSNA and pathology were 13.8% and 5%. An overall concordance rate between the pathology and OSNA was 91%.Later periods, 59 primary breast cancer cases (86 lymph nodes) were examined. 14 nodes (15.3%) were detected metastases by OSNA. The lymph nodes with micrometastases (+) were 8 and those with macrometastases (++) were 6. In the OSNA- positive 17 cases, positive non sentinel node (non-SN) cases were 7 cases (41%), negative non-SN cases were 10 cases (59%), positive non-SN cases rate was (4/11)36% in OSNA micrometastases and (3/6)50% in macrometastases.

The average time for examination by OSNA was 38.9 minutes. (34.9 minutes for one node, 46.4 minutes for two nodes, 55 minutes in 3 or 4 nodes). There was no significant difference in examination time between OSNA and pathology.

Conclusion: The OSNA method was useful and convenient method comparing with pathology. Moreover, it could save the time for intraoperative frozen examination of pathologist and laboratory technician's labors.

107 Poster

Diffusion Weighted MRI as a Biomarker for Breast Cancer Malignancy

H. Bickel[1], K. Pinker[1], W. Bogner[1], S. Gruber[1], M. Weber[1], T. Helbich[1]. *[1]Medical University Vienna, Radiology, Vienna, Austria*

Background: To evaluate differences in apparent diffusion coefficient (ADC)-values of different types and grades of malignant breast tumors and the influence of these differences on the diagnostic accuracy of diffusion weighted (DWI) MRI at 3T.

Materials and Methods: 233 patients with 279 pre-detected focal breast lesions were included. All scans were performed on a 3T MR imager, before the application of any therapy. A T2-weighted sequence, a diffusion weighted single-shot echo planar imaging diffusion weighted sequence with (b-values: 0/850 s/m^2) and a dynamic, contrast enhanced (DCE)-T1 sequence were applied. Lesions were identified on the DCE-sequence and ADC was measured in the corresponding ADC-maps, using 2-dimensional regions of interest. An ADC-threshold of 1.25×10^{-3} mm^2/s was used to differentiate benign from malignant lesions. All lesions were biopsied and histopathologically classified using the TNM-system.

Results: While ADC-values were significantly lower in all subtypes of malignant tumors, than in benign lesions, ADC-values of non-invasive lesions were significantly higher than those of invasive ones. Tumor grades inversely correlated with ADC-values, but the difference was only significant between grade I and grade III lesions. While the overall sensitivity (89.9%) and specificity (90.0%) of DWI were good, analysis of the different tumor subtypes revealed a sensitivity of only 60.9% for non-invasive tumors, while for invasive tumors, 98.5% (invasive ductal) and 92% (invasive lobular) could be obtained.

Conclusion: Non-invasive breast tumors may present significantly higher ADC-values than invasive ones. This may lead to many false negative results, which has to be considered when using DWI as a diagnostic tool.

108 Poster

Different Expression of Cyclin D1 in Normal Tissues and Normal Adjacent in Breast Cancer

R. Esmaeili[1], K. Majidzadeh-A[1], N. Abdoli[1], A. Olfatbakhsh[1], S. Mohammadi[1]. ***Background:*** *The role of tumor margin in breast cancer recurrence is one of the most important issues affecting prognosis and survival of the patients. Some observations have showed that pathologically confirmed tumor free tissues around the excised tumor may have some differences with normal tissue. identification of gene expression differences that may occur between 'normal tissue adjacent to the tumor', ' tumor tissue' and 'absolute normal tissue obtained from non-affected women' may help to confirm possible differences between normal tissue adjacent to the tumor and normal tissue.*

Material and Method: mRNA was extracted from 90 breast tumors, 90 normal adjacent and 15 normal tissues from cosmetic reductive surgery, cDNA was prepared using 1ug of total RNA (Qiagen, GmbH). mRNA expression of ki67, CDKN1B, CDKN1A, CCND1, CCNE was measured by Real-Time PCR (ABI7500) using ACTB and TFRC as endogenous control. Raw data was analyzed by Applied Bio Systems SDS software v.2. Gene expression analysis was done with REST 2009 software (Qiagen, GmbH).

Results: Comparison of gene expression between tumor and normal adjacent reveal that KI67 is up-regulated in tumors by mean factor of 3.025 with P (H1) =0. Same analysis between tumor and normal breast tissue shows up-regulation in Ki67 and down-regulation in CDKN1B by mean factor of 6.192 and 0.131 and P (H1) = 0.001 and 0.014 respectively. At last CCND1 is up regulated in normal adjacent in comparison with normal breast tissue by mean factor of 4.687and P(H1)= 0.039.

Conclusion: Although differences in gene expression profile of the tumor tissue vs. normal tissue are obvious, those of normal adjacent vs. normal breast tissue may spot to the fact that molecular analysis of surgical normal adjacent tissues can help to detect non-clear adjacent tissues which may change to tumor in the future. Obviously Excision of these tissues will reduce recurrence and improve prognosis and survival of the patients. Inclusion of more normal tissues, experiments with more genes and further analysis in protein level can help to verify this result.

109 Poster

Digital Mammography Screening − Evidence of Incremental Breast Cancer Detection by Bilateral Ultrasound at Assessment

C. Biesheuvel[1], W. Heindel[2], S. Weigel[2]. *[1]University Hospital Muenster, Reference Center for Mammography, Muenster, Germany; [2]University Hospital Muenster, Department of Clinical Radiology/Reference Center for Mammography, Muenster, Germany*

Background: We aimed to quantify the incremental breast cancer detection rate and false positive biopsy rate of bilateral whole-breast ultrasound (US) as an adjunct examination to mammography at clinical assessment of lesions detected by digital mammography screening.

Materials and Methods: From October 2005 until July 2010, a total of 2,803 women underwent whole-breast US of 3,087 recall breast sides (with mammographic abnormality) and 2,519 contralateral breast sides (without any mammographic abnormality) at our screening assessment unit. We calculated the incremental breast cancer detection rate and associated false positive rate of US per assessment participant and per breast side (recall and contralateral) and compared these with mammography.

Results: Seven patients were diagnosed with a cancer lesion detected by US only, thereby increasing the breast cancer detection rate from 13.8% (386/2,803) to 14.0% (393/2,803) per assessment participant. For an additional two patients, US changed the diagnosis from unilateral to bilateral breast cancer. The incremental breast cancer detection rate of US was 0.13% (4/3,087) in recall sides and 0.20% (5/2,519) in contralateral sides. The overall false positive rate of biopsies induced by US only was 66.7% (18/27), compared to 62.3% (668/1,073) for mammography-induced biopsies.

Conclusions: We demonstrated that supplemental whole-breast US examination resulted in a relatively small incremental breast cancer detection rate in both recall and contralateral breast sides, whereas the associated false positive biopsy rate was acceptable. The incremental cancer yield should be weighed against the costs of bilateral whole-breast US in the clinical assessment of mammography screening.