Results: 400 consecutive breast core biopsies were performed over this 18 month period.

	Free hand biopsy	Image guided biopsy	p value
Total number (%)	304 (76%)	96 (24%)	
Median number of cores taken per biopsy (range)	2 (1−8)	4 (1−7)	<0.00001
Median number of days lapsed between patient assessment and core biopsy (range)	0 (0−50)	8 (0−34)	<0.00001
Median number of days lapsed between patient assessment and result given (range)	7 (2−52)	16 (2−44)	<0.00001
Sensitivity	294/304 (96.7%)	95/96 (98.9%)	0.19
Cancer Ratio	1:1.1	1:2.5	0.04

Conclusions: 76 % of biopsies have been performed free hand with no significant difference in diagnostic sensitivity compared with image guided biopsies. In a selected group, free hand biopsies provide the added advantage of early diagnosis and subsequent treatment.

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Examination of the Sentinel Lymph Node Identification in Breast Cancer That Used the Contrast-enhanced Ultrasonography and Blue Dye Without Radioisotope

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Background: The utility of Sentinel lymph node (SLN) biopsy is clear, therefore the axillar lymph node dissection is omitted. At present, the SLN identification method has technique of the radioisotope and the blue dye method, and combination method or independent method is performed. There were a merit, a demerit in each, and we performed blue dye independent method thus far, bud we have experienced the case that identification of SLN has difficulty with. Omoto reported the technique useing the contrast-enhanced ultrasonography with Sonazoid as a new method to make up for these faults in 2009. The Combination method of radioisotope and bleu dye method is very effective because identification rate, but there is the problem that being bombed and the difficult treatment. Therefore we planned feasibility study of SLN identification method by the combination method with contrast-enhanced ultrasonography with Sonazoid (CEUS) and blue dye.

Materials and Methods: Twenty-six patients with Primary breast cancer were recruited. The cases of axilla lymph node metastasis clinically were excluded. The method is sonazoid 2ml intracutaneous injection at the subareolar and identified SLN guiding ultrasonography guide after enough massages and marked the skin of the part. Indigo carmine1ml intracutaneous injection at the subareolar was perfomed during an operation, and make an incision in the marked point by CEUS, and SLN biopsy is performed.

Results: As for the identification of SLN by CEUS, one SLN was 18 cases, two were 8 cases, and an average was 1.3 of SLN. As for the identification of SLN by blue dye, an average number of SLN was 2.11(1−7), non SLN was 2.42(1−6). After the axillar incision, an average time of SLN identification was 10.8 minutes(3−22).

Conclusions: Positioning of SLN which was more precise than before incision was enabled by CEUS combined with conventional bleu dye method, and it contributed to shortening in SLN identification time. Furthermore, the identification of the lymphatic vessel was enabled by CEUS, and the identification of SLN which it was hard to identify was possible by the blue dye method. As for the SLN identification method by CEUS, the precision of the blue dye method improves without the danger of the being bombed; the combination method with CEUS and blue dye was feasible.

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Feasibility of Contrast-enhanced and High-resolution 7 Tesla MRI in Patients with Suspicious Breast Lesions

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Background: 7T MRI offers diagnostic possibilities that have the potential to improve the staging of breast cancer patients. The purpose of this study was to assess the feasibility of 7T contrast-enhanced breast MRI, using a sensitivity-optimized RF coil setup, and its amenability to BI-RADS-MRI-conform analysis.

Materials and Methods: 18 women with 21 suspicious lesions on mammography or ultrasound (BI-RADS 4 (n = 4), and BI-RADS 5 (n = 14)) were included for 7T imaging (Philips Healthcare, Cleveland, USA), using a homebuilt two-channel unilateral RF breast coil. The scan protocol included a fat-suppressed 3D T1w gradient echo dynamic series during which 0.1 mmol/kg Gadobutrol was injected [TR/TE 5.0/2.0ms, FOV 160^3 mm^3, acquired res. 1 mm isotropic, temp. res. 63s]; and a high resolution T1w 3D gradient echo SPAIR sequence [TR/TE/TI 7.0/2.9/120ms, FOV 120^3 mm^3, acquired res. 0.45×0.57 7times; 0.45 mm^3]. Two radiologists scored all exams blinded for clinical information. Image quality of the dynamic series was scored as insufficient, sufficient, good or excellent. All lesions were scored according to BI-RADS-MRI criteria. High-resolution images were similarly scored for image quality, and for additional clinical value using 4 options: none; increased reader confidence; change in interpretation or other. Only biopsy-proven malignant lesions were included in further analysis.

Results: Image quality of the dynamic series was scored sufficient (n = 8/8, (radiologist 1/ radiologist 2)), good (n = 9/10) and excellent (1/0). All 18 malignant lesions were detected by both radiologists, scored according to the BI-RADS-MRI criteria and assessed as a BI-RADS-MRI category 4 or 5 lesion, i.e. suspicious abnormality or highly suggestive of malignancy, respectively. High-resolution images were obtained in 15 patients. They showed great detail of the lesions' morphological features. Image quality was scored sufficient (n = 1/0), good (n = 2/9) and excellent (n = 12/6). More than half of the high-resolution scans increased reader confidence (n = 13/9 cases). Moreover, in some cases (n = 3/5) the radiologist changed his interpretation of BI-RADS-MRI descriptor(s).

Conclusion: This study has shown the technical feasibility, at least sufficient image quality, and amenability of contrast-enhanced and high-resolution 7T MR exams to BI-RADS-MRI-conform analysis. This allows for further exploration of the clinical potential of high-field breast imaging while simultaneously providing BI-RADS-conform diagnoses at 7T.

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Completion Axillary Dissection Can Safely Be Omitted in Screening Detected Breast Cancer Patients with Micrometastases in the Sentinel Node Biopsy

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Background: The need for completion axillary dissection in breast cancer patients with micrometastases in the sentinel node biopsy is controversial.

Material and Methods: During 2001 to 2010 a total of 1822 breast cancer patients had surgery at Lund University Hospital. Of 1822 patients, 1323 had a sentinel node biopsy and all patients with micro- and macrometastases had axillary dissection. Isolated tumour cells in the sentinel lymph nodes were not offered any further axillary surgery. The sentinel lymph nodes were analyzed by frozen sections at the time of surgery and on paraffinembedded tissue for definitive pathological result.

Results: Micrometastases >0.2 mm and $\leqslant$2.0 mm were found in 42 (8%) of 521 screening detected cases and in 80 (10%) of 802 cases with clinical breast cancer. None of the screening detected cases with micrometastases had metastases in the completion axillary dissection whereas metastatic non-sentinel nodes were found in 17 (21%) of the clinical cases with micrometastases. Screening detected cases with micrometastases had a median tumour size of 14 mm (7−30 mm) as compared with a median tumour size of 18 mm (5−51 mm) of the clinical cases. No statistical difference was seen in age (median 61 vs 57 years), number of sentinel nodes (median 3.0 vs 2.5), number of axillary nodes (mean 13 vs 12 nodes), size of micrometastases (median 1 mm in both groups), ER status (83 vs 91% cases positive), PgR (69 vs 80% cases positive), or histological grade (grade 1, 2 and 3: 31, 55, 14 % vs 24, 49, 27%). For clinically

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.

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

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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.

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

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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.

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

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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