cytoplasm with more distinct cell outlines compared with their images in histologic section, and they were seen isolated or in clusters along the basal layer but often permeating the epidermis. The infiltration of inflammatory cells and profuse collagen strands were well recognized even in the low power synchrotron images, but the squamous epithelium of epidermis was not. The minute changes of each malignant cell showing the features of cancer tissue, such as cellular differentiation and nuclear grade, were also not identified well.

Conclusions: The x-ray microscopic images of Paget's disease of breast tissue sections by synchrotron radiation showed a good correspondence with the histopathologic findings of their stained tissue sections. Without staining of breast tissue section, the synchrotron image of Paget's disease revealed the characteristic Paget cells within the epidermis very well. Therefore, the synchrotron imaging of Paget's disease appears to have a great possibility for the clinical and research purposes in the future.

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Mammographic density decreases with age as assessed by an objective integral automated breast density measurement system

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Purpose: To assess the average decrease of percent mammographic density (PMD) of women routinely screened with full-field digital mammography (FFDM) in two consecutive screens as determined by an automated breast density measurement system.

Material and Methods: 338 women who underwent routine screening with FFDM were included in this retrospective study. 235 women were aged <50 (mean age 42 yo) and 103 >50 (mean 58 yo). Density of two consecutive screens spanning 1 to 4 years was measured separately on mediolateral oblique and craniocaudal images using an integral automated volumetric breast density measurement system (Hologic, Quantra). The volume of fibroglandular tissue, the total breast volume and the percentage of fibroglandular tissue were analyzed by Quantra. Right-left (R-L) correlation of Quantra measurement was assessed for both screens. To assess the relationship of density to age, we considered a single density measure at the second screen for each subject. Data were analyzed by linear regression to determine the decrease of PMD with age per year of age for all ages, the > and <50 group.

Results: There was an excellent R-L correlation of breast densities for all ages as assessed by Quantra ($p < 0.001$). Average PMD of the <50 group was 28.3% (SD = 18) at 1st screen and 27.1 (SD = 12.4) at 2nd screen. The single measure of density at 2nd screen significantly declined with age, −0.6% per year of age ($p = 0.02$). Average PMD of the >50 group was 23.7% (SD = 36.2) at 1st screen and 21.1 (SD = 21.6) at 2nd screen. Density at 2nd screen did not significantly decline with age, −0.5% per year of age ($p = 0.1$). In all ages combined there was a significant decline with age: 0.6% per year of age ($p < 0.001$).

Conclusion: An objective automated breast density measurement system confirms a significant decline of PMD with age per year of age of up to −0.6% especially in women aged 50 years and younger.

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Texture analysis applied to full field digital mammography: ability to discriminate between invasive ductal and invasive lobular breast cancer − preliminary results

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Background: To determine texture features of IDC and invasive lobular carcinoma ILC of the breast on full-field digital mammography (FFDM). To evaluate the ability of texture analysis to differentiate between those tumor types.

Materials and Methods: 23 IDC and 10 ILC imaged with FFDM were included in this study. For each lesion ROI was manually defined covering the lesion and 1 cm normal-appearing breast tissue around the lesion. Texture features derived from the grey-level histogram, the co-occurrence matrix, the run-length matrix, the absolute gradient, the autoregressive model, and the wavelet transform were calculated for the ROIs. Fisher coefficients were calculated to determine which texture features were best-suited for distinguishing between IDC and ILC. Based on the combination of those five texture features with the highest Fisher coefficients, lesion classification was performed, using LDA (linear discriminant analysis) and PCA (principal component analysis) classifiers. Classification accuracy was used as the primary outcome measure.

Results: The five texture features with the highest Fisher coefficients were all derived from the wavelet transform. Using LDA and PCA, classification accuracies of 78.8% (26 of 33 lesions) and 81.8% (27 of 33 lesions) were achieved, respectively.

Conclusions: Texture features best suited for discrimination between ILC and IDC are derived from the wavelet transform. Our preliminary data suggest that texture analysis of breast cancer cases imaged with FFDM allows a good degree of accuracy of discrimination between IDC and ILC.

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Prevalence of hyperplastic tissue changes in breast biopsy specimen obtained from MR-guided vacuum biopsy

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Background: Increased contrast uptake on breast MR imaging can serve as biomarker for epithelial proliferation. Epithelial proliferation, in turn, may be used as a marker for increased risk of subsequent breast cancer. Aim was to investigate the prevalence of hyperplastic tissue changes in breast biopsy specimen obtained from MR guided vacuum biopsy.

Material and Methods: Between 07–2008 and 10–2009, 175 MR guided vacuum biopsies were performed in 143 women for contrast enhancing lesions seen in breast MRI alone (i.e. without correlate in mammography or second look ultrasound). We investigated the prevalence of proliferative tissue lesions (severe usual or atypical hyperplasia, lobular hyperplasia, LCIS, papillomatosis, flat epithelial hyperplasia, complex sclerosing lesion, or lesions requiring immunehistochemical staining to rule out malignant degeneration) versus non-proliferative tissue changes.

Results: Of 175 cases, 122 proved to be benign. Among the benign lesions, a total 57 proved proliferative. This corresponds to a prevalence of proliferative changes of 47% (57/122).

Conclusion: Among women undergoing MR guided vacuum biopsy for benign tissue changes, a high fraction exhibits proliferative tissue changes. Further studies are needed to investigate whether these proliferative changes (and, thus, breast MR imaging findings) can be used to identify women at increased risk for breast cancer.

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Does radiopharmaceutical molecule size change number of sentinel lymph node in breast cancer patients?

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Background: Sentinel lymph node (SLN) biopsy became a standart procedure in early stage breast cancer in order to decrease unnecessary axillary dissection. Tc-99m labeled tincolloid (400–3000 nm) and nanocolloid (<100 nm) are two radiopharmaceuticals usually used in sentinel lymph node biopsy. Our aim is to find out whether any difference between these 2 molecules while sentinel lymph node biopsy

Material and Methods: A retrospective study was performed on breast cancer patients who underwent SLN biopsy between April 2002 and March 2008. Last 50 tincolloid used patients (Group 1) and first 50 nanocolloid used patients (Group 2) were selected in order to study. Clinicopathologic characteristics of tumor (size, type and grade), age of patients, the number of SLNs were recorded.

Results: Mean age of the patients for tincolloid group and nanocolloid group were 55.4 and 52.8 respectively ($p = 0.30$). According to the clinicopathologic characteristics there were no statistical difference between tincolloid group and nanocolloid group ($p > 0.05$). Mean number of SLN for Group 1 and 2 were 1.73 and 2.18 respectively ($p = 0.038$).

Conclusions: As regards the identification rates between tincolloid and nanocolloid group there was no statistically significant difference. On the other hand the number of sentinel lymph nodes are increased in the small molecule size group.