evaluate the diagnostic efficacy of contralateral mammography in patients presenting with unilateral operable breast cancer.

Methods: The case records and bilateral mammograms of 1755 patients who were operated between May 2005 and December 2006 were reviewed. Of these 1755 women, 40 (2.3%) patients had a clinically palpable abnormality in the contralateral breast; all were subjected to mammography and biopsy. The remaining 1715 patients had a clinically normal contralateral breast, of which, 5 patients had an abnormal contralateral mammogram. All 5 underwent mammographic localization and biopsy of the suspicious lesions.

Results: In 40 women with clinically abnormal contralateral breast, 19 also had a suspicious or indeterminate lesion on mammogram. On biopsy, 23 of 40 (or, 1.3% out of 1755) turned out to be malignant. Of the remaining 1715 patients with clinically normal contralateral breast, 5 had abnormal mammograms and only one of these 5 (0.06% of 1755) had a positive finding in the form of ductal carcinoma in situ (DCIS) at biopsy. Thus, 1715 mammograms were done to detect one DCIS (0.06%). It was interesting to note that no mammographic abnormality was detected in the clinically normal contralateral breast in women below the age of 50 years.

Conclusion: Thus, in a country like India, where the incidence of breast cancer is low, in women with unilateral breast cancer, mammography is neither useful nor cost-effective in the diagnosis of contralateral breast cancer at time of diagnosis.

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Comparative analysis of synchrotron radiation images of breast cancer tissue with their histopathologic findings

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Background: Synchrotron radiation is expected to improve the quality of clinical breast imaging. It provides detailed images of internal structures of the breast tissue samples with a great magnification and an excellent resolution. Using phase contrast technique, we got monochromated synchrotron images of breast cancer tissue. To figure out relation with their histopathologic findings, we compared the synchrotron images of the breast cancer tissues with their optical microscopic findings of stained adjacent breast tissue section.

Material and Methods: A x-ray microscope was installed on 1B2 beamline of Pohang Light Source, a third generation synchrotron radiation facility with operating energy of 2.5 GeV in Pohang, Korea. The x-ray energy was set at 11.1 keV and the x-ray beam was monochromatized by a W/B4C monochromator. Zernike phase-shifter was adapted for phase contrast x-ray microscopy. Formalin-fixed 10μm-thick breast cancer tissues were attached onto the Kapton film. The sample was positioned 25 m away from the beam source. The x-ray image of sample was converted into a visual image on the CsI(Tl) scintillation crystal, and magnified 20 times by microscopic objective lens. After additional 10 fold digital magnification, this visual image was captured by a full frame CCD camera. For a comparative analysis with its synchrotron image, adjacent tissue section was stained and the histopathologic features of the sample were captured by image analyzer.

Results: The monochromated x-ray microscopic images of breast tissue from breast cancer were obtained with a good resolution. The total magnifying power of this microscope was up to 200×. These images revealed various structures of breast cancer tissues with a good contrast and high visibility by phase contrast technique including proliferation and irregular infiltration of stroma, loss of ductal structures and infiltrating tumor cells into adjacent fat tissues. But lymphocytes nests infiltrating into connective tissues and other fine histopathologic features of breast cancer tissue were not identified well with this phase contrast technique only.

Conclusions: Using monochromated synchrotron radiation, the x-ray microscopic images of the breast cancer tissue were obtained. These images showed a good correspondence with the histopathologic findings of adjacent stained tissue sections. From these images obtained, x-ray microscopic imaging of breast cancer tissue with synchrotron radiation appears to have a great possibilities of use for clinical and research purposes in the near future.

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Examination of US and MR images for pathological complete response in early breast cancer cases

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Background: In cases in whom primary systemic chemotherapy (PSC) has been effective, it is often very difficult to distinguish on preoperative images whether or not a residual tumor still exists. We examined US and MR images in cases showing a pathological complete response (pCR) to identify specific features which would be useful for assessing residual disease.

Materials and Methods: All 149 cases undergoing surgery after PSC, from January 2006 through December 2007 in our institution, had received anthracycline-based chemotherapy followed by taxanes or anthracycline alone. There were 14 pCR cases and 13 in whom only ductal carcinoma in situ (DCIS) remained. We examined mainly US and MR images from these cases, after chemotherapy, in detail.

Results: Proportions of cases positive for NG3, ER(−), PR(−) and HER2(3+) were high among those with pCR and only DCIS. Among these cases, only hormone receptor levels differed significantly in comparison with other PSC cases.

All five cases in whom evidence of tumors disappeared on US showed pCR. Other US findings included 6 with mastopathy-like findings, 3 with intra-ductal lesions and 12 with nodules. DCIS was observed in all cases in whom an intra-ductal lesion persisted. Even if nodules remained, the proportion showing pCR was relatively high (75%) if an acoustic shadow suggesting fibrous change was present.

On MR imaging, disappearance of lesions was seen in eight cases, while eight showed a segmental enhancement pattern and five had nodules. DCIS was observed in 63% of cases that showed a segmental enhancement pattern. Likewise, two-thirds of cases with mastopathy-like findings on US had residual tumors. The presence of mastopathy in the background, may obscure remnant tumors. Both examinations must therefore be conducted with great care to avoid missing these residual tumors.

All three cases in whom lesions were undetectable on both US and MR images showed pCR. Two-thirds of cases in whom the lesions were undetectable on either US or MR images had pCR.

Conclusions: The diagnostic usefulness of US and MR images is limited due to the degree of ductal spread, which often persists after PSC and varies markedly among cases. With US, it is difficult to distinguish between benign and malignant lesions. MR imaging often overestimates residual disease. However, we can enhance the prediction of pCR to some extent by using these two imaging modalities together and carefully interpreting the results.

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Stereotactic vacuum-assisted microbiopsy and precancerous/in situ breast lesions – a monoinstitutional experience

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Background: The issue of diagnostic assessment after mammographic detection of suspicious early disease has been recently improved by new technologies. Our aim was to retrospectively assess the accuracy and clinical usefulness of stereotactic vacuum-assisted microbiopsy (VAB) in the diagnosis of precancerous and in situ lesions of the breast.

Patients and Methods: From January 2003 to July 2007 a consecutive monoinstitutional series of 222 patients underwent a stereotactic VAB. The biopsies were performed using a vacuum suction device (11 gouge probe) with digital stereotactic equipement-guided Mammotome (Fisher prone table). A mean number of 10.8 samples (3−19) were obtained, measuring 3−50 mm (mean size: 13 mm) in diameter. The biopsy site was marked with a nonmagnetic metallic clip when the entire lesion was removed. Among this population we selected patients with VAB diagnosis of both atypical hyperplasia (AH) and intraepithelial neoplasia (IN) and data were compared with definitive diagnosis on surgical specimen.

Results: In 96.3% of patients VAB resulted incisional (lesion only partially removed) while in the remaining 3.7% of cases excisional (lesion totally removed). Among all 222 patients who underwent the procedure the VAB diagnosis was: n = 91 benign lesions (40.9%), n = 38 AH (17.1%; ADH 81.5%, ALH 18.4%), n = 54 IN (24.5%; ductal IN 94.4%, lobular IN 5.5%) and n = 39 invasive carcinoma (IC: 17.5%). Surgery was performed in all