US DIAGNOSIS OF NONPALPABLE BREAST LESIONS

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Introduction: We are attempting to establish criteria to discriminate between benign lesions (intraductal papilloma and ductal hyperplasia), which are especially difficult to differentiate, and early breast cancer.

Methods: The subjects were 30 histologically confirmed benign lesions (17 intraductal papilloma and 13 ductal hyperplasia) and 44 breast cancers (≤2cm) out of a total of 81 nonpalpable breast cancers, between January 1995 and June 1998 in our hospital. We compared the visual characteristics of benign lesions and malignant tumors on screen using B-mode and power Doppler imaging.

Result: The internal echo showed echo free or fine and homogeneous structural effects in 38 (86.4%) of 44 breast cancers. By contrast these same characteristics existed in only 10 benign lesions (6 intraductal papilloma and 4 ductal hyperplasia) constituting a rate of 33.4%. In most of the breast cancer cases, the boundary echo showed non-existent or manifested irregular thick lines. In contrast, the benign lesions showed regular fine lines in 23 cases, representing a high rate of 76.7%. Posterior echo showed a high rate of no change for both benign lesions and breast cancer. This was especially true of 32 breast cancers (72.8%).

Conclusion: In order to discriminate between benign lesions and breast cancer it is important to look at the internal and the boundary echoes.
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BREAST CANCER MASS SCREENING BY ULTRASONOGRAPHY

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Purpose: This study aimed to evaluate the ultrasonography for mass screening of the breast cancer.

Materials and Methods: From 1987 to 1997, the mass screening of the breast cancer was performed with palpation, inspection and ultrasonography in Tochigi Prefecture. From 1987 to 1988, only who had positive findings with palpation or inspection took ultrasonography at the screening site. The last year in this series, all applicants took ultrasonography with palpation and inspection. The total number of applicants was 192,479 in those 11 years. The ultrasonic equipment used were SSD-125 and SSD-900 (ALOKA) with 7.5-MHz transducer. Both breasts were scanned by sonologist. In early phase, ultrasonic images were recorded on video tape, and on magneto-optical disc in late phase. These images were diagnosed by medical doctors of SJSUM (Senior Fellow of the Japan Society of Ultrasonics in Medicine).

Results: From 1987 to 1996, the total number of applicants was 174,521, and the number of positive findings by palpation or inspection was 13,382. Among them, 3,182 women were needed to take precise examination by on site ultrasonography. 111 breast cancer were detected (0.06%).

In 1997, total number of applicants was 17,958. With palpation or inspection, only 1138 women were pointed out some findings while 2,880 had positive findings by ultrasonography. Among them 727 persons were requested more precise examination and 23 breast cancers were detected (0.13%).

Conclusion: In this series, on site ultrasonic examination reduced the number of persons who should take precise examinations. And the mass screening of breast cancer with ultrasonography for all candidates can detect more breast cancers.
EFFICACY OF ULTRASONOGRAPHY IN BREAST CANCER SCREENING

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Purpose: To evaluate the efficacy of ultrasonography in breast cancer screening compared that with physical examination only.

Materials and Methods: We checked 28,693 patients from May 1996 to Dec 1998 using ultrasonogram at breast cancer screening in total and 1,303 (4.54%) patients were received further examination. The criteria for further examination were suspicious of cancer, fibroadenoma, intracystic tumor, and calcification, benign tumor (suspicious of malignancy).

Results: We discovered 19 (0.07%) cases of breast cancer among 1,303 patients. And we discovered 31 (0.07%) cases of breast cancer using physical examination.

Conclusion: We could detect more non-palpable breast cancer by US than by physical examination only. Breast-conserving surgery could be applied for those patients with early-stage breast cancer. Since many Japanese women have dense breast, sensitivity of US is expected to be higher than that of physical examination or mammography.
IN THE EVALUATION OF NONPALPABLE BREAST LESIONS WITHOUT CALCIFICATIONS: DO MAMMOGRAPHY AND ULTRASONOGRAPHY HAVE A DIAGNOSTIC BENEFIT COMPARED WITH MAMMOGRAPHY ALONE?

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Purpose: To assess the added value of breast US and mammography compared with mammography alone in the evaluation of nonpalpable breast lesions without calcifications.

Materials and Methods: We evaluated 108 nonpalpable nodules without microcalcifications on which mammogram and US were performed. Histologic diagnosis of benign (n=84) or malignancy (n=24) was made by excisional biopsy under localization (n=40) or core biopsy (n=68). The mean size was 1.2 cm, with a range of 0.3-3 cm. Without knowledge of histologic results, authors retrospectively classified mammogram and US on the basis of the BI-RADS final assessment categories. We compared diagnostic index of sensitivity, specificity, positive and negative predictive value and accuracy.

Results: Of 108 nodules, overall accuracy in mammogram alone was 75.0% and that in mammogram and US was 73.1% (p=0.735). Category 2 (n=1) and category 3 (n=8) on mammography alone were all proved to be benign and category 5 (n=6) on mammography were all proved to be malignant. Of category 4 (n=36) lesion, overall accuracy was 36.1% in mammogram alone and 69.4% in mammogram and US (p=0.003). Of category 1 (n=57) lesion in mammogram alone, 5 were proved to be malignant, which were all dense breast. At add of US in category 1 with dense breast, sensitivity and negative predictive value were 100%, however, overall accuracy decreased 72.7% from 90.9% in mammogram alone.

Conclusion: In nonpalpable breast lesions without calcifications, US as an adjunct to mammography reveals comparable accuracy than do mammography alone. US is highly recommended in category 4 lesions and can be recommended in category 1 with dense breast if the greatest sensitivity or negative predictive value is wanted.
SONOGRAPHIC EVALUATION OF DUCTAL CARCINOMA IN SITU OF THE BREAST

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Purpose: To evaluate the sonographic findings of ductal carcinoma in situ (DCIS).

Materials and Methods: Of 134 patients with pathologically proven DCIS, 47 patients (48 breasts) who underwent sonography before surgery were included. Twenty-seven patients were asymptomatic compared to 20 patients who experienced symptoms. The presence of the lesion and its findings on sonography were analyzed retrospectively. When a mass was identified on sonography, the mass was evaluated as follows: shape, margin, echogenicity, associated microcalcifications, and intervening echogenic lines.

Results: Sonography detected 81% (39/48) of DCIS (masses [n = 24], microcalcifications [n = 6], and additional findings [n = 9]). The masses were irregular in shape in 13 cases and oval or lobulated in 11 cases. The margins were ill defined in 17 lesions and the echogenicity was mildly hypoechoic in 18 lesions. Additional findings consisted of micronodules smaller than 5-mm in diameter (n = 6) and periductal thickening (n = 3) and these findings were often associated with masses or microcalcifications.

Conclusion: Sonography is effective in demonstrating DCIS. The most common findings of identified masses are ill-defined margins, irregular shape, and mild hypoechogenicity. Associated findings include intervening echogenic lines and microcalcifications. Periductal thickening or micronodules may be the only finding.
BREAST DUCTAL CARCINOMA IN SITU: 
ULTRASONOGRAPHIC FINDING AND ITS USEFULNESS

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**Purpose**: To evaluate the ultrasonographic (US) findings of Ductal Carcinoma In Situ (DCIS) and its usefulness.

**Materials and Methods**: In 15 patients with pathologically proven DCIS, US and mammography findings were evaluated retrospectively. The presence of nodule, microcalcifications and ductal dilatation on US was compared with mammogram.

**Results**: In US, nodule (n=7) or nodules (n=3) without microcalcifications were most common followed by nodules with microcalcifications (n=3). And two cases showed no abnormal findings. Other findings were ductal dilatation (n=3), hypoechogenicity (n=13), and heterogeneous internal echo (n=12). On mammograms, nodule (n=7) without calcifications were also common followed by microcalcifications only (n=3) and nodules with microcalcifications (n=2). Two cases missed by US showed microcalcifications only on mammogram, and three cases missed by mammography showed multiple nodules (n=2) or single nodule without microcalcifications (n=1) on US.

**Conclusion**: The most common finding of DCIS on US is single irregular margined hypoechoic nodule with heterogeneous internal echogenicity. But if microcalcifications or ductal dilatation are accompanied by nodule(s), DCIS should be differentiated from other benign mass on US.