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Doppler ultrasound assessment of tumour response

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Purpose: To investigate the use of Doppler ultrasound in the assessment of tumour response to medical therapy.

Methods: 25 women with breast cancer were treated medically with tamoxifen. The patients were scanned using an ATL Apogee 800 ultrasound machine prior to treatment and at 1, 2, 3 & 6 months after initiation of their therapy. The size of the tumour was assessed in B-mode. The vascularity of the breast was imaged using colour Doppler ultrasound and the Peak Doppler Frequency (PDF) of the blood flow in and around the tumour was measured.

Results: 10 of the 25 patients showed a reduction in the B-mode tumour volume measurement. After 3 months 80% of these 10 responders showed a corresponding reduction in the PDF (with an average change of −0.80 kHz [−29%]). After 6 months 100% of the responders showed a reduction in the PDF (with an average change of −1.10 kHz [−39%]).

15 of the 25 patients did not show a reduction in the tumour volume. After 3 and 6 months 73% of these non-responders showed an increase in the PDF (with an average change of +0.34 kHz [+12%] at 3 months and +0.76 kHz [+26%] at 6 months).

Conclusion: Peak Doppler Frequency is concordant with changes to tumour volume and may help evaluate response in those patients where clinical and B-mode interpretation of tumour response is difficult to assess.

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Recurrent breast cancer after conservative surgery: Role of contrast enhanced MR imaging

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Purpose: to evaluate Breast Magnetic Resonance Imaging (MRI) in patients who have undergone surgery and have clinically and/or conventionally imaging suspected recurrence at the surgical site.

Methods: we reviewed 70 patients treated with conservative surgery and radiation theraphy. Recurrence was suspected on the mammograms, palpation and on both. MRI examination at 1.5 T using 3D, GE sequences, pre- and post-Gadolinium was performed in all patients after 18 months surgical and radiation treatment.

Results: 26 of 70 patient had recurrent cancer. We report the results of those studies with histopathologic correlations (n° 30) or with at least 24 month-follow up (n° 40). In 26/26 of recurrencies the enhancement morphology was characterized as mass enhancement at the surgical site. In 4/26 multifocality enhancement were identified elsewhere in the breasts that had recurrent tumor at biopsy.

Conclusions: an enhancing mass at the surgical site had the highest positive predictive value and suggests recurrence. There are often associated sites of recurrence in the breast. MRI can significantly impruve diagnostic accuracy with elevate (100%) negative predictive value.

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Technetium-99m-sestamibi mammoscintigraphy in suspected breast cancer. Radiologic and histologic correlations in 43 surgically treated patients

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Background: Breast cancer and non-palpable breast lesions incidence are growing and mammography failed to detect at least 10% of malignancy, especially in fatty, dense and abnormal breast. Many alternative studies have been tested and mammoscintigraphy with 99mTc-sestamibi showed interesting possibilities. The aim of this study was to determine sensitivity and specificity of mammoscintigraphy in identifying breast cancer and its usefulness in differential diagnosis.

Patients and Methods: We retrospectively analysed 43 female patients with a median age of 56 years (range 32 – 86 years). Fifteen (33.3%) patients were in pre- or perimenopausal and 30 patients were postmenopausal. Fine needle aspiration biopsy (FNAB) showed malignancy in 38 patients and atypical ductal hyperplasia or complex sclerosing lesions in 5 patients, while 37/41 (90.2%) patients had mammographic signs of cancer or abnormalities. All patients received 20 mCI99mTc-sestamibi intravenously and underwent mammoscintigraphy and two lateral and one or two anterior planar images were obtained by a single head gamma camera equipped with high-resolution collimator.

Results: All patients underwent surgery and in 39 (90.7%) cases a histologically confirmed breast cancer was found. At pathological examination the size of the tumor ranged from 6 to 50 min (median 15 mm) and in 6 (15.4%) patients with nonpalpable lesions it was excised under stereotactic guidance requiring a wire needle localization and subsequent histologically confirmed diagnosis before definitive surgical treatment.

Mammography, FNAB and mammoscintigraphy showed sensitivity of 84.6%, 97.4% and 76.9% respectively. Five of the 9 tumors undetected by scan were nonpalpable and in only two cases there were mammographic diagnosis of cancer. In 4 patients (10.2%) both mammoscintigraphy and mammography had false negative results and the overall sensitivity resulted of 89.7%, while FNAB showed true positive results in 3 of these patients. We observed 100% sensitivity with each technique.

Conclusions: This preliminary study confirm the role of 99mTc-sestamibi mammoscintigraphy in early and mammographycally undetected breast cancer as additional and maybe necessary noninvasive procedure. In patients with suspected or abnormal FNAB requiring excisional biopsy it can helpful in surgical planning.

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The efficacy of ultrasound-guided core needle biopsy for breast mass

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Objective: To evaluate the efficacy of ultrasound-guided core needle biopsy (CNB) as the optimal diagnostic tool for the suspected breast cancer on image or proliferative lesion by fine needle aspiration cytology (FNA).

Patients and Method: Between August 1995 and November 1997, CNB, using Bard Biopsy Gun, was performed on 198 patients (224 lesions), because there was a discrepancy between diagnosis on image and the result of FNA, or were diagnosed as proliferative lesion by FNA.

Results: The final pathological diagnosis showed 79 cancers of 80 positive CNB and 9 cancers of 77 negative CNB. The sensitivity, specificity, and accuracy was 90%, 99%, and 94%, respectively. No complications were encountered.

Conclusion: Ultrasound-guided core needle biopsy can be used effectively and safely as the optimal modality in diagnosing suspected breast cancer.

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Comparative study of fat suppressed MR imaging of breast cancer relative to mammography with microcalcification

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Purpose: MR imaging has disadvantage unable to image foci of microcalcification on mammogram, but has advantage of high sensitivity for cancerous invasion and multifocality of breast cancer. We evaluate the comparative accuracy of fat suppressed MR imaging relative to mammography with microcalcification for assessing the extent of breast cancer and what kind of operation to select.

Methods: We performed fat suppressed MR imaging (SPIR and FFE methods) and mammography in 145 breast cancer cases from Apr. 1995 to Feb. 1998. Preoperative MR imaging findings and histologic results were analyzed regarding to tumor size and multifocality of 37 cases with mammographically microcalcification undergoing mastectomy or breast conserving operation.

Results: In ten of 37 (27%) cases, the index tumor was not seen at mammography with microcalcification, while MR imaging did not miss any index tumor. The size of calcified lesion on mammographic images was analyzed. Thirteen of 20 (65%) cases with the tumors less than 3 cm in size were underestimated on mammogram, while MR imaging showed no significant difference in size compared with that found in a pathological evaluation. Five of 20 (25%) cases with the tumors less than 3 cm underwent breast conserving operation, although fifteen cases (75%) underwent modified radical or simple mastectomy because of cancerous invasion or multifocality on MR imaging.