

therapy. MS SPECT follow-up in the course of combined chemo- and radiation therapy revealed decrease of ^{99m}Tc -MIBI accumulation by 25–45%, supporting usage of the technique for control of non-surgical treatment.

Groups of lymph nodes	Axillar	Subclavicular	Supraclavicular
Detected by ^{99m}Tc -MIBI mammoscintigraphy	28	9	5
Verified pathologically	31	12	7
Sensitivity of ^{99m}Tc -MIBI	90.3%	75%	71.3%

Hencefore we conclude the SPECT mammoscintigraphy with ^{99m}Tc -MIBI provides correct data on the extent of metastatic spread in breast cancer and can be used for both design of therapy and also for dynamic follow-up.

P23 Monitoring the efficacy of primary chemotherapy for breast cancer using breast scintigraphy and immunocytochemical bone marrow screening

H. Sommer, R. Tiling, S. Braun, B. Proehl-Steimer, C. Kandziora. *I. Frauenklinik and Dept. Nuclear Medicine Univ. of Munich, D-80337 Munich, Germany*

Primary chemotherapy is indicated for inflammatory breast cancer, primary metastatic breast cancer, and to decrease tumor size to allow lumpectomy instead of mastectomy. To date, conventional monitoring of chemotherapy success includes mammography, ultrasound, and sometimes tumor marker level. These methods are unsuitable to monitor inflammatory breast cancer.

In this pilot-study, breast scintigraphy with Tc-99m-Sestamibi, an established method for tumor differentiation, was used as an alternative method of therapy monitoring in inflammatory breast cancer. Additionally, bone marrow aspirates were obtained from each patient to screen for breast cancer micrometastases before and after chemotherapy, using the pancytokeratin monoclonal antibody A45-B/B3 for tumor cell detection. Up to now ten patients were examined with breast scintigraphy and bone marrow aspiration before and after primary chemotherapy for inflammatory breast cancer. In six patients a clinical regression of disease could be observed. - Parallel a diminished tumor perfusion could be detected by scintigraphy and previously positive micrometastasis in bone marrow aspiration changed to a negative result. Four patients did not respond to chemotherapy and did not show changes in diagnostic results as well.

We conclude that breast scintigraphy and bone marrow screening might be a promising approach to monitor therapeutic efficacy in cases where conventional monitoring fails to predict the clinical outcome

P24 Scintimammography & MR mammography in assessing palpable breast masses and recurrent tumour

H.M. Fenlon, N.C. Phelan, P. O'Sullivan, S. Tierney, T.F. Gorey, J.T. Ennis. *Depts. of Radiology & Surgery, Mater Hospital/University College Dublin, Ireland*

The early detection of recurrent tumour during adjuvant therapy is important in planning management including second-line therapy. We compared prospectively TC-99m tetrofosmin scintimammography (TSM) with MR mammography (MRM) in 47 patients of mean age 51 (26–79) with palpable breast lumps. A remote history of carcinoma in the affected breast was present in 11 patients. All patients had TSM, contrast-enhanced MRM and plain-film mammography (PFM) (age >35) performed on the same day. All lesions had biopsy or aspiration cytology within two weeks of imaging and the pathology and imaging results were correlated. Claustrophobia in three patients lead to discontinuation of MRM – of the 44 remaining patients the pathology was malignant in 21 and benign in 23. The overall sensitivity of PRM was 81%, with a specificity of 82.4%, a positive predictive value (PPV) of 85% and a negative predictive value (NPV) of 77.8%. The sensitivity of TSM was 95.24%, specificity 91.3%, PPV 90.9% and NPV 95.45%. The sensitivity of MRM was 90.5%, specificity 91.3%, PPV 90.5%, and NPV 91.3%.

Four of the 11 patients with a history of breast cancer had recurrent tumour. In 2 of these 4 patients, PFM failed to detect recurrent carcinoma while suggesting tumour recurrence in 2 of 7 patients with postoperative fibrosis alone. TSM was positive in all 4 patients with recurrent disease and negative in all 7 cases of benign scar tissue. MRM correctly characterised 7 of the 9 lesions with one false positive and one false negative result.

In conclusion, TSM and MRM are both accurate in differentiating benign from malignant breast lesions but TSM is more accurate in evaluating the post-operative and post radiotherapy breast. Because of lower cost, wider availability and high patient acceptance, TSM is superior for the non-invasive characterisation of breast masses, including tumour recurrence and may also have a role in monitoring adjuvant therapy.

P25 Tc-99m-sestamibi scintimammography for the evaluation of breast malignancies

I. Pappo, T. Horne, Y. Horn, R. Orda. *Departments of Surgery "A", Nuclear Medicine and Oncology; Assaf Harofeh Medical Center, Sackler Faculty of Medicine, Tel-Aviv-University, Zerifin, Israel*

We evaluated the efficacy of Tc-99-sestamibi (MIBI) scintimammography for the detection of breast cancer in 351 patients. In two-hundred and twenty five patients with breast abnormalities, the scans were confirmed by histological or cytological results. The other patients who did not have pathological results, were examined because they belonged to high-risk groups, had dense fibroglandular breast or were scanned before starting radiotherapy after having breast lumpectomy.

The mean age of the patients was: 49.8 years (range was: 17–84 years).

The results demonstrated among patients with pathological results, positive scan in 125 women: 86 scans were true positive, while 39 examinations were false positive. In 101 patients scintimammography was negative: 94 examinations were true negative, while in 7 cases the result was false, and the patients suffered of malignant tumor of the breast. Six out of seven false negative results were obtained in patients with non-palpable tumor. Among those patients with pathological results, the obtained sensitivity, specificity, positive and negative predictive values were 92.3%, 70.7%, 68.8% and 93.1% respectively. Total accuracy was: 80%.

Our conclusion from the present study is that MIBI scintimammography is a sensitive and accurate method for the detection of breast malignancies and may be part of the available armamentarium for this purpose.

P26 Evaluation of breast cancer utilizing proton magnetic resonance spectroscopy (MRS)

P.K. Julka, N.R. Jagannathan, M. Singh, P. Raghunathan, O. Coshic, G.K. Rath. *All India Institute of Medical Sciences, New Delhi, India*

This prospective study is to evaluate the response to chemo irradiation in breast cancer utilizing the noninvasive proton MRS. Fortyone patients of infiltrating duct carcinoma of breast were investigated using bilateral breast surface coil. MR image guided in vivo localized NMR spectra were obtained from the tumours and non-tumours portion of the breast of the patients using STEAM RF pulse sequence. The spectra were obtained in pre and post chemo-therapy and radiotherapy settings. Localized proton MR spectra of the unaffected contralateral breast of these patients are dominated by resonances arising from fat and are similar to the breast tissue from normal (control) volunteers, while in the malignant breast tissues the water resonance dominates. Elevated water/fat ratios are measured in malignant tissues, compared with the contralateral unaffected breast tissue of the patients. Statistical analysis of the MRS data demonstrates a decrease in the water/fat ratio in patients receiving full course of chemotherapy compared to the pre-therapy ratio ($p < 0.04$). The observed trend in W/F ratio suggests an attractive marker for diagnosis, prognosis and therapeutic follow-up of breast carcinoma. Further, the water suppressed proton MR spectra of malignant breast tissue reveal several metabolite resonances of low concentration including the choline peak around 3.2 ppm and other minor resonances in the region of 8.5 ppm due to protons of purine and pyrimidine nucleotides, thus providing additional useful markers.

P27 The determination of tissue polypeptide antigen (TPA) in follow-up of breast cancer

R. Findeisen¹, K. Deutschmann², B. Richter², S. Albrecht², W. Distler².

¹*Institute of Clinical Chemistry and Laboratory Diagnostics, Dresden-Friedrichstadt-Hospital, Friedrichstr. 41, D-01067 Dresden, Germany;*

²*Department of Gynecology and Obstetrics, Technical University Dresden, Fetscherstr. 74, D-01307 Dresden, Germany*

Breast cancer is one of the most serious diseases in women both in its incidence and death rate. Tumormarker are playing an important role in the follow-up of breast cancer. Giron et al described, that the concentration of TPA in tumor cell cytosol is a good indicator of prognosis (1). Cancer antigen 15-3 (CA 15-3), Carcinoembryonic antigen (CEA) and Tissue polypeptide antigen (TPA) were measured in 464 sera of breast cancer patients and in 71 sera of women without breast cancer. The tumormarkers were determined using immunoluminometric assays (ILMA) manufactured by Biuck-Sangtec Diagnostica, Dietzenbach. The assays are characterised by an Interassay-Variance and Intraassay-Variance <4%. The breast cancer patients were staged according to the TNM classification stage 0–IV (by UICC). Median and range of each stage were investigated (2). The cut-off values (95. percentile of tumor-free control group) of CA 15-3, CEA and TPA were determined: specificity, sensitivity, positive, negative predictive value (PV) and efficiency were investigated for these cut-offs and the receiver-operating-characteristic (ROC)-curves were calculated.

Results: The CA 15-3 and TPA median values are measured higher by about 30 percent in patients with stage 0 + 1 than in patients of the tumor-free control