

341

POSTER

**Doppler ultrasound assessment of tumour response**

T.M. Robinson<sup>1</sup>, M. Halliwell<sup>1</sup>, Z. Rayter<sup>2</sup>. <sup>1</sup>Department of Medical Physics; <sup>2</sup>Bristol Breast Unit, Bristol Royal Infirmary, Bristol, UK

**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.

342

POSTER

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

M.L. Grandinetti<sup>1</sup>, F.R. Ferranti<sup>1</sup>, E. Saracca<sup>1</sup>, I. Venturo<sup>2</sup>, C. Nistico<sup>2</sup>, C. Botti<sup>3</sup>, M. Crecco<sup>1</sup>. <sup>1</sup>Department of Diagnostic Imaging; <sup>2</sup>Department of Clinical Oncology; <sup>3</sup>Department of Surgical Oncology, Istituto Regina Elena per lo studio e la cura dei tumori, Via Regina Elena, 291, Roma, Italy

**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 therapy. 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 ( $n^{\circ}$  30) or with at least 24 month-follow up ( $n^{\circ}$  40). In 26/26 of recurrences 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 improve diagnostic accuracy with elevate (100%) negative predictive value.

343

POSTER

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

F. Lurachi, P. Zucchetto, P. Cagnato, P. Fontana, F. Polistina, G. Favia. University of Padua, Clinica Chirurgica I, Via Giustiniani 2, I-35128 Padova, Italy

**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 mCi 99mTc-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 mm (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 mammographically undetected breast cancer as additional and maybe necessary noninvasive procedure. In patients with suspected or abnormal FNAB requiring excisional biopsy it can be helpful in surgical planning.

344

POSTER

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

S. Mitsuyama<sup>1</sup>, K. Anan<sup>1</sup>, M. Ono<sup>2</sup>, S. Toyoshima<sup>3</sup>. <sup>1</sup>Dept. of <sup>1</sup>Surgery; <sup>2</sup>Radiology; <sup>3</sup>Pathology, Kitakyushu Municipal Medical Center, Japan

**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.

345

POSTER

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

K. Kanasugi<sup>1</sup>, T. Uji<sup>2</sup>, S. Noda<sup>1</sup>, T. Ohtsuka<sup>1</sup>, Y. Inada<sup>2</sup>, H. Komoriyama<sup>1</sup>, I. Tanaka<sup>1</sup>, H. Ikezawa<sup>1</sup>, M. Hagiwara<sup>1</sup>, T. Shinagawa<sup>3</sup>. <sup>1</sup>Department of Surgery; <sup>2</sup>Department of Physics; <sup>3</sup>Department of Pathology, St. Marianna University Yokohama City Seibu Hospital, Japan

**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 micrographically 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.

**Conclusion:** MR imaging is more effective modality for assessment of the size and number of malignant lesions in the breast than mammography.

346

POSTER

### Clinical usefulness of preoperative evaluation of mammary tumours with $^{99m}\text{Tc}$ -sestamibi imaging

E. Leppanen, H. Tykkä<sup>1</sup>, M. Leidenius<sup>1</sup>, M. Roiha<sup>2</sup>. <sup>1</sup>Surgical Department; <sup>2</sup>Imaging department, Maria Hospital, Helsinki City, Lapinlahdenkatu 16, FIN-00180 Helsinki, Finland

**Purpose:** To assess the sensitivity and specificity of scintimammography in determining the nature of mammary tumours.

**Methods:** All the patients had mammary tumours and mammography, ultrasonography, and fine-needle-biopsy were performed prior to scintimammography. All tumours were surgically removed within 2 weeks of scintimammography and histological diagnoses were obtained in all cases. Scintimammography was performed 20 min after injection of 20 mCi (740 MBq) of Tc99m-MIBI with 2 lateral and 1 anterior planar images.

**Results:** Out of 40 patients studied 23 true positive (consistent with histological diagnosis), 11 true negative, 2 false positive, and 4 false negative results were obtained. The sensitivity and specificity of scintimammography were 0.85 with a positive predictive value of 5.54 and a negative predictive value of 0.18. The false negative findings consisted of 1 ductal and 3 lobular carcinomas with tumour sizes between 7 and 15 mm.

**Conclusion:** The sensitivity and specificity of scintimammography are sufficient for determining the possible malignant nature of mammary tumours with indeterminate results after mammography, ultrasonography, and fine needle biopsy. If scintimammography is normal, a follow-up of the patient is adequate with no need for surgical intervention. In patients with a history of previous operations, severe mastopathy, or multiple benign changes in the breasts, scintimammography can be used as a screening method in routine follow-ups.

347

POSTER

### Nipple discharge correlation between: clinic, radiology and histology

D. Sabadell, M. Garcia, A. Durán, A. Cabaleiro, S. Salicrú, J. Xercavins. Breast Pathology Unit, Hospitals Vall d'Hebrón, Barcelona, Spain

**Purpose:** In a prospective study the predictive value of the correlation between the visit motive, the radiological images by galactography and the histology of the surgical piece.

**Methods:** Study in 69 patients that were presenting unilateral and secretion confined to one duct (thelorrhagia in 75.36% of the cases and serous or watery discharge in 24.63%) We have performed the next study: clinical exploration, mammography, cytology of the secretion, galactography and surgical removal of the zone indicated in the galactography. The greater frequency age is between 51 and 60 years. The galactography has been performed by coaxial technique catheter-guide. We have classified the images in 5 types: stop, ectasy, extravasation, with de fill defect, stenosis and galactoceles. The surgical removal has made canalize of the affected duct with lacrimal probe, and the surgical incision was circumareolar.

**Results:** There are no differences in the obtained radiological images in the thelorrhagia or serous discharge. The more frequency have been observed combinations of 2 or 3 types (76.81%), being the most frequent: stop, ectasia and landfill defect. The histology of the surgical removal has revealed: 43 benign disease (62.31%), 15 proliferative breast disease without atypias (21.73%), 1 proliferative breast disease with atypias (1.44%) and 10 malignant disease (14.49%). The malignant diseases, 4 of them have been invasive carcinoma (40%), 5 carcinomas in situ (50%) and 1 microinvasive ductal carcinoma (10%). In the malignant diseases a 80% was presenting clinically thelorrhagia and a 20% serous discharge

**Conclusion:** In patient with nipple discharge, the radiological image in the galactography does not have predictive value on the malignancy or benignity of the lesion, but it is the election method for the previous location the duct abnormality to the surgery.

348

POSTER

### Endocrine cell component in the breast carcinomas

O.M. Akhova, K.A. Galakhin, L.A. Zotikov, S.Y. Scliar<sup>1</sup>. Department of Pathology; <sup>1</sup>Department of Breast Tumors, Ukrainian Research Institute of Oncology and Radiology, Ukraine

**Purpose:** We have studied 180 cases of breast cancers for investigation of endocrine cell component (ECC) in them. Knowledge of neuroendocrine aspects of breast tumors could help to select tactics of treatment of the patients.

**Methods:** We used histochemical reaction of Grimelius for primary identification ECC in breast tumors and immunohistochemical reactions on chromogranin A and neuron specific enolase.

**Results:** During histochemical and immunohistochemical reactions ECC was revealed in 43 breast tumors from 180. We distinguished three types of breast cancers which contained different quantity of ECC: 1) singular endocrine cells (maximum 10%); 2) from 20 to 50% of ECC in the tumor cell population; 3) more than 50% of ECC in tumor parenchyma. There were presented saving of endocrine differentiation features in some tumor cell metastasis in lymph nodes.

**Conclusion:** ECC was shown in each 4-th breast tumor. It is necessary to use histochemical and immunohistochemical methods for right diagnosis of breast cancers with ECC.

349

POSTER

### Full length analysis of BRCA1 gene in sporadic breast cancer: Detection of common haplotypes and a novel possibly somatic mutation affecting gene translation

S. Papa<sup>1</sup>, D. Seripa<sup>1</sup>, G. Merla<sup>1</sup>, C. Gravina<sup>1</sup>, M. Giall<sup>2</sup>, P. Sismondi<sup>2</sup>, A. Serra<sup>3</sup>, G. Saglio<sup>3</sup>, V.M. Fazio<sup>1,4</sup>. <sup>1</sup>Laboratory for Molecular Oncology, IRCCS H. "Casa Sollievo Sofferenza", San Giovanni Rotondo (FG); <sup>2</sup>Division of Gynaecologic Oncology; <sup>3</sup>Department of Clinical and Biological Sciences, Università di Torino; <sup>4</sup>Patologia e Oncologia Molecolare, Università Campus BioMedico School of Medicine, Rome, Italy

**Purpose:** So far no alterations of BRCA1 gene have been demonstrated to occur in sporadic breast cancer, though 9% of sporadic ovarian cancers display somatic inactivation of BRCA1. However, decreased BRCA1 gene expression is frequently found in sporadic breast cancer possibly due to altered regulatory mechanisms. We have retrospectively screened 96 Italian sporadic breast cancer cases to identify any BRCA1 association.

**Methods:** 96 sporadic breast cancer cases, not selected for age or family history, and two age-selected unaffected female control populations (n = 98 + 81) were studied. When possible, genomic DNA was obtained from PBL, primary tumors, metastatic lymph nodes. Full RNA-SSCP analysis and direct sequencing of the 24 BRCA1 exons were performed. When needed BRCA1 analysis was extended to patient's relatives. Statistical analysis and Hardy-Weinberg equilibrium was performed by c2 test.

**Results:** 7 different common polymorphisms in complete linkage disequilibrium, both in breast cancer and control populations were identified. These polymorphisms scattering from exon 11 throughout intron 18 generated only three haplotypes. The homozygous frequency for the less common haplotype raised from 0.07 in both control populations to 0.14 in breast cancer population. No somatic mutations were identified, with the exception of a single nucleotide transversion (G > C) at position 117 of the second exon, in an early onset, very aggressive, sporadic breast cancer. This pur > pyr transversion, 3 nucleotides preceding the ATG start site, falls within the consensus sequence for the translation initiation codon. The mutation was absent in the proband's unaffected parents and the healthy brother, arguing against familial transmission and suggesting somatic origin.

**Conclusions:** Haplotype distribution may suggest a trend of association of the less common haplotype to increased risk of breast cancer. Whether BRCA1 polymorphisms may be associated with different risks, probably influenced by other genetic or environmental factors, remains to be further investigated. The characterized mutation may be the first BRCA1 somatic mutation identified in a sporadic breast cancer. This purine > pyrimidine transversion at position -3 of the consensus sequence for the translation start site matches with the already demonstrated reduced synthesis of BRCA1 in tumor tissues.