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### The Correlation of Multifocality with Lymph Node Status in Patients with Breast Carcinoma

E. de Sousa<sup>1</sup>, N.J. Bundred<sup>1</sup>, R.K. Johnson<sup>1</sup>. <sup>1</sup>University Hospital of South Manchester, The Nightingale Breast Unit, Manchester, United Kingdom

**Background:** One of the factors used to predict breast cancer prognosis is tumour size. For staging of multifocal breast cancers, the current recommendation is to use the diameter of the largest tumour nodule of the highest grade, regardless of the number or size of additional nodules. This assumes that the metastatic potential of multifocal tumours is determined by the size of the largest nodule. As a result, the total tumour burden is potentially underestimated because additional, often sizeable nodules, are not included. We explored the relationship between tumour size and lymph node metastasis. Our objective was to compare multifocal tumours and same sized unifocal tumours, to assess whether there is an observed higher frequency of axillary lymph node metastasis.

**Method:** 126 patients with multifocal tumours were identified from the pathology database between January 2005 and December 2006. A control series of 1522 consecutive patients with unifocal invasive breast cancer obtained from our database between 1992 and 1999 was used for comparison. Differences in histological type, tumour grade and size, hormone receptor status and axillary lymph node metastasis between the multifocal and unifocal groups were analysed.

**Results:** Overall, multifocal tumours had a higher frequency of positive axillary lymph nodes compared to patients with unifocal lesions of the same size (49% vs. 30%,  $p < 0.001$ ). Grade 1 tumours were more common in the unifocal group (25.7% vs. 13.5%  $p < 0.001$ ) and grade 3 tumours were more common in the multifocal group (42.1% vs. 31.3%,  $p = 0.001$ ).

**Conclusion:** Multifocal breast cancers are associated with increased axillary lymph node metastasis compared with unifocal breast cancers of identical size. An improved method of including the increased tumour burden presented in multifocal breast cancer in the future would enable more accurate assessment of metastatic potential.

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### Does Ethnicity and Social Deprivation Affect Length of Stay in Elective Breast Cancer Surgery?

A. Gunawardene<sup>1</sup>, H. Brown<sup>1</sup>. <sup>1</sup>City Hospital, Breast Surgery, Birmingham, United Kingdom

**Background:** Benefits of breast cancer surgery being performed as day-case procedures include early mobilization, a timely return to the psychological support of the family for the patient, and more efficient utilization of hospital beds. It is therefore important to identify which breast cancer patients may or may not be suitable for day-case surgery. The aim of this study was to investigate whether patients' ethnicity and level of social deprivation affect their length of hospital stay.

**Method:** A retrospective analysis of 511 elective admissions for non-reconstructive breast surgery in a single unit in Birmingham, UK between January and December 2010 was carried out using data collected from hospital records and Index of Multiple Deprivation (IMD 2010) scores were derived from the patients' residential postcodes. All procedures for treatment of breast cancer at the unit were routinely planned as day-cases or 23 hour admission. For patients having more than one procedure during the twelve month period, only the index admission was included. Chi squared and t-test were used with univariate and multivariate regression analysis and  $p < 0.05$  was taken to be statistically significant.

**Results:** 406 patients were included in the study of which, 318 (78.3%) were 'White', 38 (9.4%) were 'Asian', 22 (5.4%) were 'Black' and 28 (6.9%) were 'Other'. Median age was 60 (23-92) and 285 patients' procedures were done as day-cases with 121 patients remaining in hospital for one or more nights. On univariate analysis, the relationship to length of stay was found to be significant with age ( $p = 0.007$ ), procedure ( $p < 0.001$ ) and histology ( $p = 0.01$ ) and was not found to be significant with ethnicity ( $p = 0.972$ ) or Index of Multiple Deprivation score ( $p = 0.621$ ).

**Conclusion:** In this study age, procedure and tissue diagnosis affected length of hospital stay but ethnicity and socio-economic deprivation did not. This suggests that patients undergoing surgery for breast cancer may be suitable for day-case surgery regardless of their ethnicity or socio-economic background.

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### The Serum HER-2 Reflects the Tumor Burden of Breast Cancer

Y. Yasuda<sup>1</sup>, H. Furusawa<sup>1</sup>, Y. Maeda<sup>1</sup>, K. Komaki<sup>1</sup>. <sup>1</sup>Breastopia Namba Hospital, Breast Surgical Oncology, Miyazaki, Japan

**Background:** Human epidermal growth factor receptor-type2(HER-2) has been recognized as the prognostic and the predictive factor of breast

cancer. That is HER-2 over expression breast cancer grows rapidly and is sensitive to trastuzumab and lapatinib. On the other hand, most of all breast cancer cells have HER-2 in some degree. However it is said that there is a correlation between the tissue HER-2 and the serum HER-2 (sHER-2) which is a shed extracellular domain(ECD) of HER-2 protein, HER-2 expression of breast cancer cells are divided into four degrees in the immunochemical stain. Even if in case of lower level HER-2 expression (HER-2; IHC 1+), sHER-2 ought to increase to the tumor burden.

**Purpose:** To investigate whether sHER-2 reflects the tumor burden or not. And then to inspect that sHER-2 can be used as the tumor marker of breast cancer recurrence.

**Patients and Methods:** Retrospective study. Measurement and comparison sHER-2(ng/ml) (1) by clinical staging excluding DCIS, the neoadjuvant drug therapy and the far advanced cases ( $n = 167$ ). (2) before and after surgery ( $n = 167$ ). (3) to the tumor area ( $\text{mm}^3$ ) ( $n = 65$ ). (4) to the tumor volume (ml) ( $n = 336$ ). (5) between the recurrent and the non-recurrent cases ( $n = 36$  and  $92$ ). sHER-2 was measured by the ADVIA Centaur(Siemens Healthcare Diagnostics Co.Ltd.). Mann-Whitney U-test and Spearman's rank correlation coefficient were used in the statistical analysis and test.

**Results:** (1) There was a significance between Stage I and Stage IIIC ( $p < 0.05$ ) or Stage II and Stage IIIC ( $p < 0.05$ ). The change rate of sHER-2( $\Delta$ ) was  $\Delta -8.1\%$  in Stage I,  $\Delta -12.9\%$  in Stage IIA,  $\Delta -22.7\%$  in Stage IIB,  $\Delta -30.5\%$  in Stage IIIA. (2)  $\Delta -8.5\%$  in IHC;0,  $\Delta -10.5\%$  in IHC;1+,  $\Delta -14.5\%$  in IHC;2+,  $\Delta -24.5\%$  in IHC;3+. (3) There was a correlation to the tumor area ( $p = 0.0002$ ). (4) There was a correlation to the tumor volume ( $p = 0.02$ ). (5) There was a significance between the recurrent and non-recurrent cases ( $p < 0.001$ ).

**Conclusions:** The sHER-2 reflects the tumor burden of breast cancer. The sHER-2 can be used as the tumor marker in HER-2 over expression breast cancer.

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### Prognostic and Predictive Factors in Breast Cancer Relapse. Long-term Retrospective Study in a Cohort of Patients with Invasive Ductal Carcinoma

F. Lumachi<sup>1</sup>, F. Marino<sup>2</sup>, R. Tozzoli<sup>3</sup>, D.A. Santeufemia<sup>4</sup>, G.B. Chiara<sup>5</sup>, S.M.M. Basso<sup>5</sup>. <sup>1</sup>University of Padova School of Medicine, Department of Surgical & Gastroenterological Sciences, Padova, Italy; <sup>2</sup>University of Padova School of Medicine, Department of Pathology, Padova, Italy; <sup>3</sup>S. Maria Degli Angeli Hospital, Department of Clinical Pathology, Pordenone, Italy; <sup>4</sup>S. Maria Degli Angeli Hospital, Oncology, Pordenone, Italy; <sup>5</sup>S. Maria degli Angeli Hospital, Chirurgia 1, Pordenone, Italy

**Background:** Serum tumor markers (STM) are still widely used in cancer patients, either in monitoring the response to therapy or in predicting recurrence of the disease. However, only in selected cases they are useful for screening purposes, due to their limited sensitivity. In patients with breast cancer (BC) the most common STM used are carcinoembryonic antigen (CEA) and cancer antigen 15-3 (CA 15-3). Other useful prognostic markers are estrogen (ER) and progesterone (PR) receptors rate, monoclonal antibody MIB1 against the Ki-67 proliferating antigen, epidermal growth factor receptor 2 (HER2) status and the expression of p53. The aim of this study was to evaluate the relationship between the main prognostic markers in BC women with and without cancer relapse.

**Patients and Methods:** Overall, data from 348 medical charts of women with stage I or IIA (pT1-2, pN0, and M0 at the time of surgery) primary BC (invasive ductal carcinoma in all cases) not requiring adjuvant chemotherapy, who had undergone curative surgery, were retrospectively reviewed. Two groups were considered: Group A (cases), 54 (15.5%) patients with cancer relapse, and Group B (controls), 294 (84.5%) cancer-free patients at  $\geq 60$ -month follow-up. The following parameters were analyzed: age of the patients, size of the tumor (pT), CEA and CA 15-3 baseline serum levels, MIB-1, ER, and PR rate. Student's t-test, and Spearman's correlation coefficient (R) calculation were used to test the results.  $P < 0.05$  was considered statistically significant.

**Results:** As expected, there was a significant difference between groups (A vs. B) in age ( $56.9 \pm 12.0$  vs.  $61.2 \pm 12.9$ ,  $p = 0.023$ ), size ( $20.3 \pm 7.3$  vs.  $16.7 \pm 10.2$ ,  $p = 0.014$ ), and ER rate ( $66.0 \pm 12.3$  vs.  $58.8 \pm 17.1$ ,  $p = 0.003$ ), while PR ( $56.6 \pm 19.5$  vs.  $54.4 \pm 17.3$ ,  $p = 0.40$ ) and MIB-1 ( $22.6 \pm 10.6$  vs.  $21.6 \pm 13.3$ ,  $p = 0.58$ ) rates, as well as baseline CEA ( $6.1 \pm 5.8$  vs.  $6.3 \pm 5.0$ ,  $p = 0.79$ ) and CA 15-3 ( $27.7 \pm 13.6$  vs.  $26.1 \pm 12.4$ ,  $p = 0.39$ ) serum levels did not differ ( $p = \text{NS}$ ). In both groups (A; B) a correlation between CEA and CA 15-3 ( $R = 0.43$ ,  $p = 0.002$ ;  $R = 0.29$ ,  $p = 0.0008$ ), and between ER and PR ( $R = 0.37$ ,  $p = 0.003$ ;  $R = 0.52$ ,  $p < 0.0001$ ) was observed. There was no correlation between size and CA 15-3 ( $R = 0.18$ ,  $p = 0.019$ ;  $R = 0.10$ ,  $p = 0.07$ ) or CEA ( $R = -0.11$ ,  $p = 0.33$ ;  $R = -0.006$ ,  $p = 0.92$ ), while MIB-1 correlated with age ( $R = 0.37$ ,  $p = 0.003$ ), size ( $R = 0.44$ ,  $p = 0.0004$ ) and CEA ( $R = -0.37$ ,  $p = 0.003$ ) only in patients with cancer recurrence (Group