

sensitivity is only 40% and for women over 50 years 79.8% (interval screening).

A specific and more sensitive alternative to the mammography could be the use of proteomic biomarkers. By comparing the protein patterns in serum of patients with breast cancer with those of control persons, the differential proteins that are most discriminating for both patterns can be identified.

**Methods:** In a randomized block design pre-operative serum samples obtained from 115 breast cancer patients and 116 controls were used to generate MALDI-TOF protein profiles. The MALDI-TOF spectra generated using WCX magnetic beads assisted mass spectrometry (Ultraflex) were smoothed, binned and normalized after baseline correction. From these, a set of 76 cases and 77 controls spectra were defined as a calibration set. The remaining 39 cases and 39 controls were set-aside as validation set.

**Results:** Using the data obtained from this experiment, our department organized an international comparison to evaluate in-depth statistical bioinformatic methodology for high-dimensional protein profiles, namely "Competition on Clinical Mass Spectrometry Based Proteomic Diagnosis". For this collaborative data analysis project, we distributed the calibration dataset to invited participants, and asked them to construct a diagnostic classification rule for allocation of future patients. Upon receipt of their descriptions on chosen methodological approach and data analysis on the calibration data, we provided the validation set. The results were subsequently published in a special issue of SAGMB. <http://www.bepress.com/sagmb/vol7/iss2/>.

**Conclusions:** Comparing the serum protein patterns of patients with breast cancer with those of controls resulted in a recognition rate of 86%, a sensitivity of 88% and a specificity of 84%.

The different classification models showed consistent results (80%), which allows this method as promising for early recognition of breast cancer. Competitions such as these can serve the useful role of providing standards against which new methods should be assessed and allow critical reflection by both clinicians as well as statistical methodologically on the development and application of biostatistical informatics for proteomic spectrometry. For a next step the described procedure should be validated in patients at risk for breast cancer and in a population screening setting.

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POSTER

# **The differences of prognostic factors and pattern of failure between invasive micropapillary carcinoma and invasive ductal carcinoma in breast cancer: matched case-control study**

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**Background:** Invasive micropapillary carcinoma (IMPC) is known for its high incidence of axillary lymph node metastasis, recurrence and distant metastasis. We designed this study to identify the differences of prognostic factors and pattern of failure between IMPC and invasive ductal carcinoma (IDC) in patients with breast cancer.

**Method and Materials:** We identified 72 patients diagnosed as IMPC during 1999 to 2007 at the Samsung Medical Center. These patients were matched with 144 controls who diagnosed as IDC at the same period. Exact matches were made for age ( $\pm 3$  years), pathologic tumors and node stages, and treatment methods. Other variables were compared using Fisher exact test and the  $\chi^2$ -test. Kaplan-Meier product-limit methods were used to assess overall survival, loco-regional recurrence free survival and distant metastasis free survival.

**Results:** The median follow up was 45 months (13 to 116) in IMPC and 50 months (16 to 122) in IDC. There were no significant differences in the side of breast, primary tumor locations, extensive intraductal component, histologic grade, hormone receptors and percentage of chemotherapy and hormone therapy received between two groups. But, lymphovascular invasion (LVI,  $p < 0.0001$ ), extracapsular extension (ECE,  $p < 0.0001$ ) and high nuclear grade ( $p = 0.032$ ), which are well-known prognostic factors, were more frequently detected in the IMPC group.

There was no significant difference in the overall survival after surgery between two groups ( $p = 0.192$ ). But, the 5-year recurrence free survival after surgery showed significant differences as 68.1% in study versus 81.2% ( $p = 0.049$ ) in control. During follow-up, the treatment failed in 15 patients (20.8%) in the study group and 26 patients (18.1%) in the control group. In first site of recurrence analysis, loco-regional recurrences developed in 11 patients (15.3%) of the former and 8 patients (5.6%) of the latter, in contrast, distant metastasis developed in 5 patients (6.9%) and 22 patients (15.3%), respectively. Therefore, in survival analysis, there were no differences in the distant metastasis free survival (78.1% versus 79.1%,  $p = 0.847$ ), but 5-year loco-regional recurrence free survival was statistically significant between two groups (93.3% versus 79.1%,  $p = 0.0026$ ).

**Conclusion:** Our study showed that, in a matched case-control study, IMPC group was associated with LVI, ECE, and high nuclear grade. And IMPC group showed more loco-regional recurrence compared with

IDC group, but not for distant metastasis. Further prospective studies are necessary to confirm these results.

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POSTER

# **Ultrasound-guided radiofrequency ablation of early breast cancer in a resection specimen**

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**Background:** The trend towards less invasive local treatment of breast cancer has led to studies evaluating minimally invasive techniques to locally eradicate tumours. Radiofrequency ablation (RFA) is a minimally invasive thermal ablation technique. We performed an ex vivo study to determine the feasibility of this promising technique and evaluated the histological findings.

**Materials and Methods:** Radiofrequency ablation was performed of invasive ductal carcinoma – diagnosed by core needle biopsy – in postmenopausal women, after the surgical procedure (lumpectomy or mastectomy). A needle was placed in the centre of the tumor using ultrasound guidance. Subsequently, the tumor was ablated for a period of 12 minutes. Pathologic evaluation of the specimens was performed using conventional hematoxylin-eosin (HE) staining as well as cytokeratin 8 staining and NADH diaphorase to assess cell viability.

**Results:** Twenty patients with an average age of 66 years (range 51–78) were included in this study. The mean tumor size was 12 mm (range 7–23). Ex vivo RFA resulted in complete cell death in 17/20 lesions. In 2 patients histopathological examination revealed a microscopic focus of viable tumor cells at the margin of the tumor and in 1 lesion viable cells were found lining the needle tract. Furthermore, in 2 cases the target lesion was completely destroyed, but viable DCIS was found just outside the ablated area.

**Conclusions:** Ultrasound-guided radiofrequency ablation can result in complete cell death in small invasive breast cancer, but a high level of accuracy is required in proper positioning of the needle electrode. Furthermore, our results have led to the decision to perform a "hot retraction" to burn the needle tract in our ensuing in vivo study.

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POSTER

# **Breast cancer screening program in Khanty-Mansiysk autonomous Okrug – Yugra**

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**Introduction:** It is now widely accepted that early diagnosis of breast cancer reduces breast cancer specific mortality. Mammographic screening programmes are widespread in Europe and North America. In Russia, the most extensive program of screening for the early detection of breast cancer is currently being conducted in Moscow. Since February, 7th, 2007, there has been a breast cancer screening program (BCSP) implemented in Yugra.

**Goal:** Define the two-year results of Breast Cancer Screening Program in Khanty-Mansiysk Autonomous Okrug – Yugra.

**Results:** The reports have been provided by 21 municipal districts from March 2007 to December 2008.

149 478 women have been examined by mammography or ultrasound over this two year period, including 81 169 within the BCSP. Overall, 83 412 women from age group over 40 years have been examined using mammography, 46 254 within the BCSP. Total breast ultrasound examination has been performed on 66 066 women (34 915 within the BCSP – 55% of the total examinations).

In 2008 in the territory of Yugra 29562 women have been examined with mammography within the BCSP and 94 cases of breast cancer detected (a detection rate of 0.3%). Also detected were: 1546 cases of local pathology (fibroadenoma, local fibrocystic disease or adenosis) (5.2%), 9460 cases of fibrocystic disease of the breast (32%), 17 643 women had normal mammography (62.5%).