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# Clinical Breast Cancer

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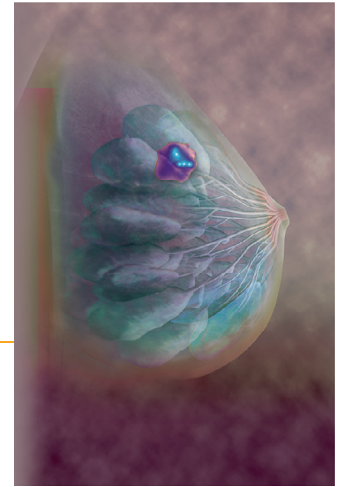


Illustration by Erin Moore

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*Ioannis A. Vathiotis, Ioannis Trontzas, Niki Gavrielatou, Georgia Gomatou, Nikolaos K. Syrigos, Elias A. Kotteas*

Immunotherapy is less effective in hormone receptor-positive breast cancer. Estrogen receptor signaling appears to cause immunosuppressive changes in the tumor microenvironment that might explain blunted antitumor responses to immune checkpoint inhibition.

- 650 Rehabilitation for Women Undergoing Breast Cancer Surgery: A Systematic Review and Meta-Analysis of the Effectiveness of Early, Unrestricted Exercise Programs on Upper Limb Function

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## Original Studies

- 666 Motor Exercises Effect on Improving Shoulders Functioning, Functional Ability, Quality of Life, Depression and Anxiety For Women With Breast Cancer

*Fahimeh Ghasemi Charati, Leyla Shojaee, Sahar Haghighat, Ravanbakhsh Esmaili, Zahra Madani, Jamshid Yazdani Charati, Seyed Hamzeh Hosseini, Vida Shafipour*

A randomized clinical trial in which 70 eligible patients participated. The intervention group had been doing motor exercises for five weeks. Shoulder ROM was measured with a goniometer, and physical fitness level was measured by 6-Minute-Walk-Test. quality of life, depression, and anxiety were measured five weeks after surgery. The results showed that motor exercises had an increase in the distance and ROM compared to the control group.

- 674 **Genetic Variations in IFNGR1, BDNF and IL-10 May Predict the Susceptibility to Depression and Anxiety in Chinese Women With Breast Cancer**  
*Bo Lan, Dan Lv, Xiaoying Sun, Min Yang, Li Zhang, Fei Ma*  
We demonstrated that the differences in single-nucleotide polymorphisms (SNPs) of Chinese breast cancer patients with psychological problems. IL-10, IFNGR1 and BDNF polymorphisms were associated with anxiety and depression in Chinese breast cancer patients during chemotherapy. Importantly, we provided important evidence for identifying people susceptible to depression and anxiety during chemotherapy and strengthening individualized management and patient treatment.
- 681 **Development and Validation a Survival Prediction Model and a Risk Stratification for Elderly Locally Advanced Breast Cancer**  
*Xiangdi Meng, Xiaolong Chang, Xiaoxiao Wang, Yinghua Guo*  
Elderly locally advanced breast cancer (LABC) still lacks useful prognostic tools and few studies have focused on it. A total of 10,697 elderly LABC patients screened from the Surveillance, Epidemiology and End Results (SEER) database were used to develop and validate a nomogram for predicting overall survival. The nomogram could provide personalized prognostic information with satisfactory clinical utility.
- 690 **FRZB is Regulated by the Transcription Factor EGR1 and Inhibits the Growth and Invasion of Triple-Negative Breast Cancer Cells by Regulating the JAK/STAT3 Pathway**  
*Haixia Liu, Yu Mei, Xiaoshan Ma, Xiaoyan Zhang, Wenying Nie*  
FRZB and EGR1 were low expressed in TNBC. EGR1 bounded to the FRZB to activate the transcription of FRZB, and then inhibited TNBC cells growth and invasion via regulating the JAK/STAT3 pathway. These findings indicate that FRZB may be a tumor suppressor gene of TNBC and a new diagnostic and therapeutic target of TNBC.
- 699 **Value of Long-term Follow-up in Surgically Excised Lesions of Uncertain Malignant Potential in the Breast – Is 5 Years Necessary?**  
*Grace Hennessy, Michael R. Boland, Marie Bambrick, Lauren Crone, Angus Lloyd, Sami Abdelwahab, Eithne Downey, Marie Staunton, Niamh Hambly, Neasa Ni Mhuircheartaigh, Jennifer Kerr, Colm Power, Deirdre Duke, Arnold DK Hill*  
The aim was to assess 5 years routine radiological/clinical follow-up in patients who had "high-risk" B3 lesions surgically excised, with recurrence or development of invasion as the outcomes. 4 of 110 (3.6%) developed invasive/in-situ disease and 4 of 110 (3.6%) developed recurrence during follow-up. Five years of routine clinical surveillance may not be necessary in patients who undergo surgical excision of "high-risk" B3 lesions. Radiological surveillance may not be necessary.
- 705 **Plasma Profile of Immune Determinants Predicts Pathological Complete Response in Locally Advanced Breast Cancer Patients: A Pilot Study**  
*Rosalba Miceli, Chunmei Cao, Nicolai N. Maolanon, Roland Jacobs, Jiong Wu, Rosaria Orlandi*  
The development of minimally invasive tools enabling early prediction of response to therapy represents an urgent clinical need. Immune-related features were profiled in pretreatment plasma samples of locally advanced breast cancer patients subjected to neoadjuvant chemotherapy. We identified a distinctive immune blood signature at diagnosis that is a significant and independent early predictor of response to neoadjuvant chemotherapy.
- 715 **Differential Expression of the Genes Coding for Adipokines and Epithelial Cell Polarity Components in Women With Low and High Mammographic Density**  
*Danila Coradini, Federico Ambrogi*  
Dense breast tissue is characterized by a high proportion of nonfatty stroma and a low proportion of adipocytes. Investigating the negative association between LEP and the genes involved in epithelial cell

polarity, we found that it weakened in dense tissue with a high epithelial content suggesting that leptin may enhance the adverse effect of stroma by promoting cell polarity disruption.

**724 Effect of Electroacupuncture Based on ERAS for Preoperative Anxiety in Breast Cancer Surgery: A Single-Center, Randomized, Controlled Trial**

*Qiu-yu Tong, Ran Liu, Yuan Gao, Kun Zhang, Wen Ma, Wei-dong Shen*

The effect of Electroacupuncture (EA) based on ERAS on preoperative anxiety in patients undergoing conservative breast surgery was evaluated. 144 female were grouped into conventional, preoperative EA, intraoperative EA, and combination of preoperative and intraoperative EA. Preoperative EA alleviated anxiety in the preoperative waiting area, and improved sleep quality. Combined techniques may more effectively improve postoperative quality of life.

**Available Exclusively Online at [www.clinical-breast-cancer.com](http://www.clinical-breast-cancer.com)**

**e727 Combination Treatment of Vinorelbine With Oral Cyclophosphamide or Capecitabine or Both Might Overcome Cross-resistance Against Eribulin in Advanced Breast Cancer**

*Kadri Altundag*

**e728 Clinical Breast Examination is Important in Surveillance After Mastectomy**

*Paula B Gordon*

**e729 The Characteristics of Pain Tolerance in Patients Who Underwent Unilateral Breast Cancer Surgery: The Effect of Handedness and Surgical Site to Assess the Potential Musculoskeletal Symptoms and Function**

*Alper Tuğral, Yeşim Bakar, Murat Akyol*

Diminished strength and altered musculoskeletal pain characteristics are well-known consequences of breast cancer treatment. This study aimed to assess myofascial pain and strength in breast cancer survivors (BCS). A total of 96 BCS were included. A Strength imbalance was prominent in BCS who underwent surgery in their nondominant site, while the pain tolerance was significantly lower in the surgical site.

**e736 Contrast Enhanced Mammography in Routine Clinical Practice: Frequency and Malignancy Rates of Enhancing Otherwise Occult Findings**

*Taylor Viggiano, Ryan Scott, Richard Sharpe, Catherine Kasper, Gina Mazza, Victor Pizzitola, Marina Giurescu, Roxanne Lorans, William Eversman, Bhavika K. Patel*

The purpose of this study is to report the frequency and malignancy rates of enhancing findings seen only on subtraction images on contrast enhanced mammography in a tertiary care breast practice. Consecutive review of CEM exams from December 2015 to May 2020 identified 4% of CEM examinations containing an enhancing finding seen only on subtraction images, ie, without low energy mammographic or sonographic correlate with PPV3 of 26%.

**e745 Preoperative MRI for Evaluation of Extent of Disease in IDC Compared to ILC**

*Einat Carmon, Talia Alster, Bella Maly, Luna Kadouri, Tal Arazi Kleinman, Tamar Sella*

We examined the concordance of pre-operative imaging with pathology regarding multifocality and multicentricity, comparing IDC to ILC, in 239 patients (IDC = 193 ILC = 46). In ILC, MRI showed superior concordance. Overall concordance in IDC was similar (70%) with MRI more commonly overestimating and mammography/US underestimating disease. MRI enhances pre-operative evaluation in ILC and may contribute to reducing postoperative residual disease in IDC patients.

- e753 Primary and Secondary Breast Sarcoma: Clinical and Pathological Characteristics, Prognostic Factors, and Nomograms for Predicting Survival**  
*Mohamed Hosny Osman, Nesma Ahmed Rabie, Ahmed O. Elmehrath, Henar M. Bedair, Salma Y. Fala, Hazem S. Ghaith, Mohamed Ahmed Refaat*  
Our study represents one of the largest population-based studies to identify characteristics and prognostic factors of breast sarcoma. We found that primary sarcoma had a better survival compared to secondary. Although radiotherapy and chemotherapy did not improve survival, patients who underwent surgery had better survival. In terms of risk factors, 60% of patients with secondary sarcoma received radiation for primary tumors.
- e764 Real-World Outcomes in Patients With Brain Metastases Secondary to HER2-Positive Breast Cancer: An Australian Multi-centre Registry-based Study**  
*Iris Tung, Cristina Moldovan, Vanessa Wong, Richard De Boer, Belinda Yeo, Laeeq Malik, Sally Greenberg, Angelyn Anton, Louise Nott, Frances Barnett, Ian M Collins, Janine Lombard, Michelle Nottage, Arvind Sahu, Javier Torres, Peter Gibbs, Sheau Wen Lok*  
Despite advances in HER2-targeted therapy, real-world patients with brain metastases secondary to HER2-positive metastatic breast cancer had a significantly shorter overall survival of 58.9 months versus 96.1 months in those who never developed brain metastases. As newer HER2-targeted agents become available, it is important to pursue clinical trials that focus on patients with brain metastases.
- e773 Locoregional Recurrence and Survival Outcomes in Breast Cancer Treated With Modern Neoadjuvant Chemotherapy: A Contemporary Population-based Analysis**  
*Sonja Murchison, Alan Nichol, Caroline Speers, Lovedeep Gondara, Nathalie Levasseur, Caroline Lohrisch, Isabelle Vallieres, Pauline Truong*  
Contemporary data guiding radiotherapy decisions following neoadjuvant chemotherapy in breast cancer is lacking. Analysis of 949 patients in a population-based, prospectively collected database confirmed that pathologic responses vary by molecular subtype, and omission of locoregional radiation for some groups, notably triple negative, may lead to worse outcomes. This supports the need for randomized prospective studies and a cautious approach to treatment de-escalation.
- e788 Characterizing Clinicopathologic Features of Estrogen Receptor-Positive/Progesterone Receptor-Negative Breast Cancers**  
*Fei Fei, Gene P. Siegal, Shi Wei*  
Approximately 12% of breast cancers have an estrogen receptor-positive/progesterone receptor-negative (ER + /PR-) phenotype. The prognosis of ER + /PR- tumors is intermediate to that between ER + /PR + and ER- /PR- tumors. A near-maximal ER expression is needed to compensate for the altered ER signaling in ER/PRtumors.
- e798 Development and External Validation of a Clinical Nomogram for Individually Predicting Survival of Metaplastic Breast Cancer**  
*Jiani Wang, Qing Li, Yang Luo, Yiqun Han, Fei Ma, Ruigang Cai, Qiao Li, Ying Fan, Jiayu Wang, Pin Zhang, Binghe Xu*  
Few studies have concerned the prognosis of metaplastic breast cancer (MpBC), a rare malignancy with distinct clinicopathological features. Our study was to develop and validate an effective nomogram for predicting MpBC survival and guiding clinical decisions. This novel nomogram based on SEER and validation Asian population with an optimal discrimination was accurate and corresponded closely with the actual survival rates.

**e807 Prognostic Impact of Radiation Therapy in Pure Mucinous Breast Carcinoma**

*Neil Chevli, Kaidi Wang, Waqar Haque, Mary R. Schwartz, Julie Nangia, Jennifer Sasaki, Andrew M. Farach, Sandra S. Hatch, E. Brian Butler, Bin S. Teh*

The National Cancer Database was used to determine the prognostic impact of radiotherapy after breast conserving surgery for patients with pure mucinous breast carcinoma. Adjuvant radiotherapy is associated with a survival advantage for patients with pure mucinous breast carcinoma. Therefore, omission of radiotherapy following breast conserving surgery for this histology is not warranted.

**e818 Mode of Detection of Second Events in Routine Surveillance of Early Stage Breast Cancer Patients**

*Soe Min Tun, Sunitha Alluri, Vida Rastegar, Paul Visintainer, Wilson Mertens, Grace Makari-Judson*

Early stage breast cancer patients are followed for recurrence incorporating imaging, clinical exam and patient history. In this study, most in-breast recurrences and new contralateral primary tumors were image-detected. The benefit of clinical exam, which was the mode of detection of cancer recurrence in 0.6 limited to postmastectomy patients suggesting a low impact in those undergoing mammography.

**e825 Vinorelbine After Prior Treatment With Eribulin for Advanced Breast Cancer: A Single-Centre Experience Suggesting Cross-Resistance**

*Alicia F.C. Okines, Tazia Irfan, Kabir Mohammed, Alistair Ring, Marina Parton, Emma Kipps, Stephen Johnston, Nicholas C. Turner*

Vinorelbine is a chemotherapy agent commonly prescribed in advanced breast cancer. We studied all patients who had received vinorelbine following receipt of eribulin, a newer anti-tubulin agent and a parallel cohort of patients who received vinorelbine without prior eribulin at a single institution. Vinorelbine is of limited benefit after eribulin, suggesting cross-resistance.

**e832 Monitoring Breast Cancer Care Quality at National and Local Level Using the French National Cancer Cohort**

*Sophie Houzard, Emilie Courtois, Christine Le Bihan Benjamin, Marie Erbault, Laurent Arnould, Emmanuel Barranger, Florence Coussy, Benoît Couturaud, Bruno Cutuli, Patricia de Cremoux, Pia de Reilhac, Chantal de Seze, Aude-Marie Foucaut, Anne Gompel, Stéphane Honoré, Anne Lesur, Carole Mathelin, Laurent Verzaux, Philippe-Jean Bousquet*

The French National Cancer Institute has developed breast cancer Care Quality and Safety Indicators (QIs) based on good clinical practices. The objective is to support quality initiatives, improve pathways and outcomes, and reduce regional inequities. QIs computation is automatable and published annually to all French hospitals. In France, BC care was found to be close to compliance with most QIs.