

# THE BREAST

## PRIMARY THERAPY OF EARLY BREAST CANCER

**Evidence, Controversies, Consensus**

**17<sup>th</sup> St.Gallen International Breast Cancer Conference**  
**Online worldwide, 17–21 March 2021**

**Accelerating access to innovation in early breast cancer**

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## The Breast: Aims and Scope

*The Breast* is an international, multidisciplinary journal for researchers and clinicians, which focuses on translational and clinical research for the advancement of breast cancer prevention, diagnosis and treatment of all stages. The Editors welcome the submission of original research articles, systematic reviews, and viewpoint/commentary and debate articles, and correspondence on all areas of pre-malignant and malignant breast disease, including:

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- Medical oncology
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- Breast surgery
- Psycho-oncology
- Quality of life
- Survivorship
- Supportive care
- Palliative and end-of-life care
- Advocacy
- Breast Nursing
- Breast Units management and organization of breast care, including health economics

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# THE BREAST

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ESO Umberto Veronesi Memorial Award (Prof. Fatima Cardoso) S1

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	Mean cost (New Taiwan dollars)	P-value
	Patients who received <17 doses of trastuzumab	Patients who received ≥17 doses of trastuzumab
Year 1	883,820	1,052,925
Year 2	277,135	455,912
Year 3	77,078	81,725
Year 4	57,208	74,413
Year 5	36,365	35,985
Total	1,260,017	1,632,150
		<b>P &lt; 0.0001</b>
		<b>P &lt; 0.0001</b>
		P = 0.70
		P = 0.11
		P = 0.97
		<b>P &lt; 0.0001</b>

**Conclusion(s):** Our work shows that within Taiwan, trastuzumab has been cost-effective in the real-world setting despite increased initial costs. Further analysis will be needed to show whether this finding holds over a lifetime horizon for patients.

**Conflict of Interest:** No significant relationships.

## Predictive and prognostic factors

### P106

#### The effects of prognostic factors on metastasis and survival of patients with breast cancer using a multi-state model

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**Goals:** Breast cancer is the most common type of cancer in women worldwide. The multi-state models help in more closely studying the factors affecting the survival of patients with this cancer. Therefore, in this study, we aimed to analyze breast cancer data using the multi-state model.

**Methods:** This was a registry-based retrospective cohort study conducted on 2030 Iranian patients with breast cancer in 2020. Data were obtained from the patients' electronic medical records. Notably, the patients' follow-up time varied from one month to 15 years. In this regard, the initial treatment, metastasis, and death are considered as the first, second, and absorbing states, respectively. The multi-state model was utilized for modeling and analyzing the data at a 95% significance level using the MSM package in R software.

**Results:** The mean age ( $\pm$ SD) of the patients included at diagnosis time was 55.3 ( $\pm$ 12.07) years old. The first one-year and 5-years adjusted transition probabilities for transitions from treatment to metastasis were estimated as 0.85 (0.15–0.89) and 0.45 (0.21–0.61), and for metastasis to death transitions, they were estimated as 0.15 (0.1–0.21) and 0.55 (0.41–0.69), respectively. The EBRT method [HR: 7.39, (0.19–28.74)], stage greater than or equal to II [HR: 1.14, (0.66–20.88)], and tumor grade greater than or equal to II [HR: 6.48, (0.55–28.39)] had an increased hazard on the transitions from treatment to metastasis state. Moreover, the average sojourn times were estimated as 0.27 and 74.85 months for the treatment and metastasis states, respectively.

**Conclusion(s):** The multi-state models by providing valuable information can help to explain the factors affecting the natural course of diseases for clinical usage compared to the other survival models.

**Conflict of Interest:** No significant relationships.

### P107

#### Breast cancer after in vitro fecundation (IVF): can ovary stimulation and follicular response affect prognostic factors?

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**Goals:** The follicular response is related with estradiol level. Study in breast cancer patients after IVF if ovarian response or number of IVF cycles affects the prognostic factors.

**Methods:** Patients with breast cancer who underwent IVF are studied the prognostic factors (Ki67, HER2, estrogen receptor (ER), progesterone receptor (PR), oncogene p53, histologic grade) in relation to the ovary response and number of IVF cycles.

**Results:** 73 patients with breast cancer after IVF are studied. They performed 135 cycles of IVF; 36 (49'3%) with 1 IVF and 37 (50'7%) with more than one IVF. Hyper response was present in at least one IVF in 24 (32.9%) patients and there was no hyper response in any IVF in 49 (67.1%) patients. The prognostic factors were: Ki 67 >20 in 31'91% (15/47) Ki 67 ≤20 in 68'08% (32/47), HER2 + 31'94% (23/72) HER2 – 68'05% (49/72), p53 + 45'09% (23/51), p53 – 54'90% (28/51), HG II-III 56'36% (31/55), HG I 43'63% (24/55), RE + 87'5% (63/72), RE – 12'5% (9/72), RP + 76'38% (55/72), RP – 23'61% (17/72). None of prognostic factors varied with the ovary response (hyper response in at least one IVF cycle, normal response, normal or low response) (p = ns). The only prognostic factor that varied with the IVF number was p53 +. Patients with p53 + (23/51), 7 (30'43%) has one IVF, and 16 (69'53%) have more one IVF (p < 0'05).

**Conclusion(s):** In breast cancer after IVF, the ovary response not affect Ki67, HER2, estrogen receptor, progesterone receptor, p53, and histologic grade. p53 positive is more frequent in patients with more than one IVF.

**Conflict of Interest:** No significant relationships.

### P108

#### Predictive mathematical modelling of recurrence periods for the secondary distant metastases in patients with ER/PR/HER2/Ki-67 subtypes of breast cancer

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**Goals:** Previously, a mathematical model of primary tumor (PT) growth and secondary distant metastases (sdMTS) growth in breast cancer (BC) (CoMPaS), considering the TNM classification, was presented (Tyuryumina E. et al, 2018). Goal: To detect the recurrence periods for visible sdMTS via CoMPaS in patients with different subtypes ER/PR/HER2/Ki-67 of breast cancer.

**Methods:** The model CoMPaS is based on an exponential growth model and complementing formulas, and the model corresponds to the TNM classification and subtypes ER/PR/HER2/Ki-67 classification. CoMPaS allows calculating the tumor volume doubling time (TVDT) of the PT and sdMTSs and the earliest recurrence period of sdMTSs. The CoMPaS model reflects:

1) subtypes of BC such as ER/PR/HER2/Ki-67, where Luminal A = HR (+)/HER2(-), Luminal B = HR(+)/HER2(+), Luminal B = HR(+)/HER2(-), HR(-)/HER2(+) and HR(-)/HER2(-), depending on the TVDT<sub>MTS</sub>;  
2) the growth processes of the PT and sdMTSs in BC patients without or with lymph node metastases (MTSs) in accordance with the 8th edition AJCC prognostic staging system for breast cancer.

**Results:** Critical growth periods of BC are defined via CoMPaS:

- (1) the non-visible growth period of the PT;
- (2) the visible growth period of the PT (appearance of the sdMTSs in other parts of body);
- (3) the non-visible growth period of the sdMTSs; and
- (4) the visible growth period of the sdMTSs.



CoMPaS correctly describes the growth period of the PT, which corresponds to the TNM and ER/PR/HER2/Ki-67 subtypes classification, the growth period of the sdMTSs and the 1–15-year survival of BC patients, taking into account TNM and ER/PR/HER2/Ki-67 subtypes classification. CoMPaS correctly describes the growth of the PT in ER/PR/HER2/Ki-67 subtypes of BC patients and helps to calculate the different recurrence periods, depending on the TVDT<sub>MTS</sub>, when sdMTSs might appear.

**Conclusion(s):** CoMPaS and the corresponding software tool can help (Tyuryumina E. et al, 2017, 2018, 2019, 2020):

- (1) to optimize the process of detecting the different recurrence periods for sdMTSs in BC patients with different tumor subtypes ER/PR/HER2/Ki-67 and the growth rate of the PT and sdMTSs;
- (2) to start the early treatment of small sdMTSs in BC patients with different tumor subtypes ER/PR/HER2/Ki-67;
- (3) to increase the survival of BC patients with sdMTSs of different tumor subtypes ER/PR/HER2/Ki-67; and
- (4) to consider the patient to be almost healthy if sdMTSs do not appear during the different recurrence periods.

**Conflict of Interest:** No significant relationships.

### P109

#### Effectiveness of breast-conserving treatment for minimal residual tumors after neoadjuvant breast cancer therapy

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**Goals:** 1. To determine the frequency of detecting a minimal residual tumour of breast using physical methods (examination, palpation), radiation diagnostic methods: ultrasound, SPECT, mammography, vacuum aspiration biopsy or another type of biopsy and/or detection of metastases in regional lymph nodes (directed signal biopsy) in addition to the standard pathomorphological examination of the surgical specimen and regional (including sentinel) lymph nodes.

2. To study the long-term results of patients (local-regional recurrence, survival) with residual (including minimal disease) and with regression (pCR) after neoadjuvant systemic therapy, in comparison with patients with primary minimal breast cancer.

3. Develop an algorithm for treating patients with minimal residual disease and complete clinical response to neoadjuvant systemic therapy for breast cancer.

**Methods:** Retrospective analysis of data on neoadjuvant systemic treatment of patients with primary resectable and locally advanced forms of breast cancer, carried out at the Petrov National Medical Research Center of Oncology of the Ministry of Health of Russian Federation in the period from 2011 to 2019.

The rates of disease (relapse)-free and overall survival of patients with residual (minimal) disease, after neoadjuvant systemic therapy (150 patients) and with primary minimal breast cancer (150 patients), based on data obtained from the database of the cancer registry of breast tumors (without randomization, only taking into account the stratification of other characteristics: breast cancer phenotype, grade of malignancy, proliferative activity Ki67).

**Results:** Survival rates between the two groups are comparable, however, in the group of patients who have achieved pCR and regression of lesion to the size of minimal carcinoma, survival rates depend on the molecular subtype and the initial stage of the disease, as well as the quality of life.

The pCR rate frequency correlates with the biological subtype of the tumor: pCR is most often recorded in HER2 overexpressing, triple negative and luminal B breast cancer subtypes.

**Conclusion(s):** The development of an effective breast-conserving treatment of minimal residual tumors after neoadjuvant therapy for breast cancer will make it possible to abandon crippling, massive surgical interventions (radical mastectomy with ALD), ensuring rapid rehabilitation and a high quality of life for patients.

**Conflict of Interest:** No significant relationships.

### P110

#### Evaluation of incidental implantation of tumor cells after diagnostic needle biopsy in breast cancer patients

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**Goals:** Implantation within the biopsy scar using core needle biopsy (CNB) or vacuum aspiration biopsy (VAB) has been noted as a risk factor for ipsilateral breast cancer recurrence (IBTR). However, the risk factors for implantation have not yet been adequately studied. Thus, we aimed at evaluating the practical characteristics of and the risk factors for implantation at our hospital.

**Methods:** We retrospectively reviewed 4400 consecutive breasts of patients who underwent CNB or VAB followed by breast cancer surgery without neoadjuvant chemotherapy or endocrine therapy between January 2012 and September 2020. Implantation is defined as the presence of tumor cells within a biopsy scar between the tumor and the skin, as reported in postoperative pathological reports. The clinicopathological characteristics of these cases resulting in implantation were compared with those of non-implantation cases, and their risk factors were evaluated using multivariate analysis.

**Results:** Implantations were observed in 58 (1.32%) eligible cases. The average age was 54.8 years; 49 patients underwent CNB and 9 underwent VAB. The implantation group had more ER-positive tumors close to the nipple (E area) and invasive micropapillary carcinomas than the non-implantation group. In multivariate analysis, ER-positive tumors close to the nipple (E area) were identified as risk factors for implantation.

**Conclusion(s):** The number of cases with implantation within a biopsy scar was limited. We found that cases with implantations are significantly likely to have ER-positive tumors close to the nipple (E-area) and invasive micropapillary breast carcinomas. It is worthwhile to include biopsy scars in excision specimens and skin incisions in the cases of having these characteristics in order to prevent IBTR.

**Conflict of Interest:** No significant relationships.

### P111

#### Comparing MammaPrint and Blueprint results between core needle biopsy and surgical resection breast cancer specimens

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**Goals:** The COVID-19 pandemic continues to strain healthcare systems globally. The ESMO COVID-19 adapted recommendations<sup>1</sup> advocate for the use of pre-operative/neoadjuvant endocrine therapy as a strategy to defer surgery by 6–12 months in clinical stage I-II breast cancers to prioritize resources for patients that require urgent care. Accurate risk assessment is an integral component of this prioritization process. Adjuvant studies such as MINDACT showed that up to 46% of clinically high risk tumors were classified as genomic Low Risk with MammaPrint, and still have excellent outcomes at 8-yrs with endocrine therapy alone, highlighting the potential for overtreatment if using clinical-risk alone. Here, gene expression results with MammaPrint (MP) and Blueprint (BP) were