World Health Organization 4th ed
Classification of Tumours of the Breast

SG Jordan, SB O’Connor, TJ Lawton
Departments of Radiology and Pathology and Laboratory Medicine

Introduction
The World Health Organization (WHO) establishes the standard for histopathologic diagnoses, defining diagnoses on a per organ system basis.

The most recent classification of breast tumors is the 4th edition published in 2012. The publication reflects the views of a Working Group convened by the International Agency for Research on Cancer (IARC), Lyon France September 1-3, 2011. 30 authors from 24 countries contributed. The end result is an authoritative reference book that serves as the international standard for oncologists and pathologists.

This exhibit is designed to increase radiologists’ and technologists’ understanding of breast pathology, to enhance CME and CEU at this conference.

Invasive Breast Carcinoma (IBC)

Breast Cancer 2017
Estimated new cases and deaths from breast cancer in the US
New cases: 246,660 (female), 2,240 (male)
Deaths: 40,650 (female), 410 (male)

IBC No Special Type and Invasive Lobular Carcinoma together account for 70-75% of invasive carcinoma tumour types. We must be knowledgeable about these and the remaining 10-30% of invasive carcinoma tumour types. Given the sheer annual number of newly diagnosed breast cancers, the uncommon breast tumour types is special tumour types still is seen in your practice.

Epithelial Tumours
Invasive breast carcinoma
Invasive carcinoma of no special type
Invasive lobular carcinoma
Tubular carcinoma
Cilindromatous carcinoma
Mucinous carcinoma
Carcinoma with modulatory features
Carcinoma with apocrine differentiation
Carcinoma with signet ring cell differentiation
Invasive micropapillary carcinoma
Invasive trabecular carcinoma
Metaplastic carcinomas
Carcinoma with neuroendocrine features
Sarcomatoid carcinoma
Invasive papillary carcinoma
Invasive solid carcinoma
Mucoid carcinoma
Mucoepidermoid carcinoma
Polyplasmic carcinoma
Chondrosarcoma
Liposarcoma
Lipoma
Syringomatous tumor of the nipple
Paget’s disease
Syngangiomatous tumor of the nipple (Sezary)

Tumours of the Nipple

Metastatic Tumours
Defined: Metastasis to the breast from a malignancy arising outside the breast
Wide range of uncommon malignancies can metastasize
Haematological malignancies, Melanoma, Carcinomas of lung, ovary, prostrate, kidney and stomach, Carcinoid
In children: Rhabdomyosarcoma and Lymphoma

Tumours of the Breast

WHO 4th ed Broad Categories

Epithelial Tumours
Mesenchymal Tumours
Fibroepithelial Tumours
Invasive Breast Carcinoma
Rarer types:

Malignant Lymphoma
Metastatic Tumours
Tumours of the Male Breast

References

• https://www.cancer.gov/about-cancer/treatments/understanding-molecular-therapy.htm

Acknowledgements
Joanna Schwochert UNC SOM Class of 2019
North Carolina Radiological Society

Molecular Subtypes
Differences in the molecular definition of breast carcinomas account for the heterogeneity of breast cancer presentation and clinical course. Knowledge of the differing tendencies of each type of breast carcinoma assists in understanding disease prognoses and directing care recommendations.

Molecular Subtypes 2017
Luminal A
Luminal B
Her2-enchanced
Basal type

These are defined by their gene expression patterns:
Luminal are hormon receptor+ with associated genes, distinguished as low (luminal A) or high (luminal B) Her2-enchanced are HER2+ Basal type are TNBC, and have catalogued clinical patterns and treatment responses/tumors per subtype.

Clinical Patterns

NEW in this WHO edition are 2 Clinical Patterns
BILATERAL BREAST CANCER (BBC)
Defined: primary carcinoma developing in both breasts. One must first exclude metastasis from contralateral cancer (CBC) pre with local, regional, distant mets more likely to have CBC. BBC can in if one breast is DCIS or the other is normal.

Inflammatory Breast Cancer
Defined: Rare but aggressive form of invasive cancer with distinct clinical and/or pathologic characteristics. The clinical inflammatory crisis is due to the presence of numerous dermal lymphatic emboli, with rapid breast enlargement and skin redness, edema, orange peel. A skin bi is NOT required but is helpful as it confirms dermal lymphatic involvement. Invasive cancer NST grade 3 is the most common histologic type.