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Multiparameter characterization of breast carcinoma: subgross, microscopy, proteins, and genes

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The morphology of breast carcinoma is often very complex. Tumor characteristics which are detectable at the low resolution level of radiology and those detectable only with high resolution of microscopy or even higher resolution of gene sequencing are seemingly very different, but a close relationship between them can be evidenced. As the subgross morphological parameters and molecular phenotypes have been studied separately, this relationship has not received the attention it deserves. Tumor size, lesion distribution, disease extent, and intratumoral and intertumoral heterogeneity are subgross morphological parameters of breast carcinomas that are essential for proper diagnostic characterization of the disease. If assessed adequately by modern multimodality radiology and large-format histopathology, these parameters individually provide significant prognostic information. The molecular phenotype categories for breast carcinomas were recently defined and their prognostic and predictive power is determined. Luminal A tumors are often small and stellate (star-like) at radiology and rarely associated with calcifications. Luminal B, basal-like and triple negative cancers are most often round/oval and are significantly larger at average at the time of detection compared to Luminal A tumors. HER2 expressing tumors are more often multifocal and associated with a high-grade in situ component (casting type microcalcifications) than cancers with other molecular phenotypes. Diffuse invasive carcinomas are rare but have an unfavorable prognosis, despite having luminal phenotype. The interrelation of subgross, microscopic and molecular parameters indicate the necessity of multiparameter characterization of breast carcinomas for proper diagnosis and therapy.

Biography

Tibor Tot, associate professor of pathology at the University of Uppsala and head of Laboratory Medicine Dalarna, Sweden, is faculty member of the breast pathology arm of the European School of Pathology (ESP), and scientific director in the European School of Oncology Certificate of Competence in Breast Cancer program. Publications: 6 textbooks, 20 book chapters, and 80 journal articles mostly on radiological – pathological correlation of breast diseases. He is repeatedly invited speaker on international congresses, member of the European Working Group for Breast Cancer Screening Pathology and past chair of the Working Group for Breast Pathology of the ESP.

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