Preface

Breast cancer is one of the most common malignant tumors among women in many parts of the world today. In addition, it is also one of the leading causes of cancer death. In contrast to the situation for many other malignant tumors, modern imaging modalities allow the early diagnosis of breast cancers, most often in asymptomatic women. Generally, the earlier a cancerous lesion is detected, the better the prognosis. The early detection of a suspicious lesion is not only, however, the conclusion of the diagnostic work-up. In many situations it is important to further clarify the nature of the lesion by performing additional imaging and/or percutaneous biopsy. Furthermore, in the case of malignancy, it is necessary to rule out or verify the presence of additional cancerous manifestations. A complete diagnostic work-up is the prerequisite for achieving the best possible individual outcome on the one hand, and for reducing the number of unnecessary open biopsies on the other.

Terminology and strategic proceedings in breast diagnostics have changed to a greater extent than in other diagnostic imaging areas over the last years. The limitations of certain imaging techniques can often be compensated for by the performance of additional procedures. To attain the maximum of relevant diagnostic information, it is important to be aware and informed about the strengths and weaknesses of the physical examination, x-ray mammography, ultrasonography, and MR mammography. Numerous studies have evaluated the efficiency and limitations of each of these components of breast diagnostics. X-ray mammography remains the primary technique in the early diagnosis of breast cancer. It allows the detection of breast carcinoma in its earliest stages, when prognosis is best, through the visualization of minimal tumor induced changes. In addition, when mammography is performed in asymptomatic women, it allows the detection of occult carcinomas. For these reasons, mammography continues to be indispensable. Screening programs in European countries and the USA, however, have shown the performance of x-ray mammography alone to have major limitations. Its sensitivity in women with dense breast tissue, a relevant number, is significantly reduced.

The complementary performance of breast ultrasonography in women with dense breast tissue can often compensate for the limitations of mammography in these cases. Especially in the hands of an experienced examiner, ultrasonography allows the visualization of mammographically inaccessible areas of the breast due to dense tissue. Furthermore, ultrasound has no known health risks and is the standard imaging method used for examining younger women, and is also obligatory in the work-up of a patient with an indeterminate palpable lesion. In contrast to mammography and ultrasound, MR mammography not only provides information on the morphology of breast lesions, but also investigates vascularization as a metabolic-dependant characteristic. As with x-ray mammography, however, MR mammography is a widely standardized procedure which allows the acquisition of comparable image sets over time. Specialized image post-processing accentuates suspicious findings for the viewer.

In addition to the importance of the appropriate application of the various examination modalities in the diagnostic work-up of breast lesions, examination techniques, image analysis, assessment, and the ensuing therapeutic consequences should be in agreement with national and international standards. The image quality of mammography, for example, has been categorized according to the PGMI-criteria of the British national health service breast screening program (NHSBSP). The basis for terminology and lesion assessment used in mammographic image analysis was presented in the BI-RADS ™ lexicon by the American College of Radiology (ACR), and has since been firmly established in the German speaking countries of Europe. An analogous US-BIRADS lexicon serving as the basis for breast ultrasound image analysis was presented by the breast sonography work group of the “Deutsche Gesellschaft für Ultraschall in der Medizin” (DEGUM, German Society for Medical Ultrasound Applications). For the interpretation and assessment of MR mammograms there is the so-called “Goettinger Score” and its derivative, the MRM-BIRADS-categorization. New aspects con-

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sidered in MR mammographic interpretation pertain to the degree of contrast enhancement seen in the normal parenchyma (MRM-Density-Type 1 – 4), and the extent of motion artifacts in the subtraction image (MRM-Artifact-Score 1 – 4). Both parameters represent a measure of the diagnostic sensitivity of the examination. Pictorial representations of the relevant classifications are included in this book in tabular form as a removable appendix.

The detection of a suspicious lesion in the breast usually requires the performance of further diagnostic procedures. In the presented clinical cases we show examples where the interventional diagnostic work-up usually conforms with the well-established guidelines and standards. In some cases, however, deviations from the standard course of action are shown to illustrate alternative procedures when the individual case demands it, or to allow for patients' wishes.

This book offers the reader the opportunity to make deliberations and decisions on 100 example cases in breast diagnostics. Each case includes information about patient complaints, personal history, risk profile, and clinical findings. The reader is able to view the relevant image material at his/her leisure and come to his/her own conclusions. He/She is able to practice analyzing and describing the images, as well as making an assessment after taking the possible differential diagnoses into account. On the pages following each case, an explicit commentary explains which diagnostic procedures were performed and the actual, often histologically verified diagnosis is revealed. In this way the interested reader is able to achieve a maximal training effect.

Because most of the presented images in this book are digital, the printed images are of high quality without loss of image information. This provides the reader with image material that allows a realistic evaluation. There are only a few exceptions when patients presented in our clinic with recently performed conventional mammograms. When not otherwise indicated as examinations not performed by the authors, all breast sonograms were performed with a Logic 5 (General Electric MS). The digital mammograms were performed using the full field digital mammography system Senograph 2000D (General Electric MS). MR mammography and MR interventions were performed using the Echospeed system (General Electric MS; MRI Device). Stereotactic interventions were performed on the Lorad-Premium intervention table (Medicor). The Vacora System (Bard) was used for stereotactic vacuum biopsies.

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