

Foreword

In the modern world of medical pedagogy, the practitioner must become a perpetual student. Through seminars, journals, meetings, day-to-day conversations with colleagues, and the wonderful new world of the Internet, today's radiologist is constantly challenged by an ever-expanding world of knowledge. The immense volume of complex information does not alter the need to quickly apply this information in daily casework. The textbook remains an integral part of this knowledge base. However, modern textbooks no longer can be simple repositories of information. Such texts are impractical considering the pace of modern medicine and the seemingly ever-increasing caseload. Current reality mandates that textbooks serve as a practical "desk reference," a tool that helps to rapidly answer questions as they arise in one's daily casework. This textbook, *Multimodality Breast Imaging, A Correlative Atlas*, in its second edition, meets this need brilliantly. It is timely, clearly written, excellently illustrated, and has the simplicity and brevity necessary to serve as a useful desk reference.

This textbook is well organized for the practicing radiologist who usually employs mammography primarily, and then uses sonography or other modalities to answer questions either raised or not addressed by the mammogram. Dr. Hashimoto organizes her textbook by mammographic findings and then effectively illustrates the pathologic entity. Each chapter carries the clinician radiologist through an analysis according to the specific mammographic abnormality.

This text documents the integral importance of sonography in breast imaging. Breast imaging now requires a multidisciplinary approach. The use of all modalities, as discussed in the text, must be brought to bear on the clinical problems encountered in the individual case. Increasing importance is being placed on the proposition that breast imagers not only attempt to find as many breast cancers as technically possible, but to find them without subjecting ten women to needless breast biopsies for every cancer detected. The surest means to this end is the appropriate application of alternative technologies to film mammography.

I first met Dr. Beverly Hashimoto as a resident in radiology at the University of California–San Francisco. I was

very pleased when she accepted a fellowship in diagnostic sonography under my direction. She showed herself to be a student of extraordinary talent and to have an admirable dedication of purpose. I believed she was well suited to a typical academic post at a university. Instead, she opted to join the prestigious Virginia Mason Clinic. Beverly helped to teach me that an inquisitive mind could flourish anywhere. Many university academicians would envy her academic pursuits, publications, and national prominence. The responsibility to advance radiological imaging lies not only in academia but in private practices as well. I am most proud of my students who have achieved significant academic success in a non-university setting.

Although magnetic resonance imaging is likely to have an increasing impact on solving breast imaging problems as time goes on, currently sonography has the greatest ancillary benefit to film mammography. Breast sonography has a somewhat checkered past. In the early to mid-1980s, there was a strong push by several equipment developers to produce an automated, whole-breast, sonographic imaging device. Shortly after achieving success, claims of great ability in the detection of breast cancer began to appear. However, the data ultimately indicated the automated, whole-breast, sonographic imaging was not on a par with radiographic mammography. The experience left a bad taste in the mouths of many sonologists and mammographers. This episode undoubtedly retarded the growth and acceptance of sonographic breast imaging. However, to their credit, a small cadre of dedicated researchers took up the task of developing sonography in breast imaging for more than deciding whether a mass was cystic or not. Dr. Hashimoto figures prominently in this group of dedicated researchers. This book is the culmination of her years of excellent work in this medical arena.

Roy A. Filly, MD

Professor of Radiology, of Surgery, and of Obstetrics
Gynecology and Reproductive Sciences
Chief, Section of Diagnostic Sonography
University of California–San Francisco

Preface

One of the most important trends in breast imaging has been the expanding number of imaging technologies directed toward diagnosing breast cancer. This book is targeted for breast imagers who are interested in integrating these imaging techniques in breast cancer diagnosis. The initial didactic chapters are focused on teaching practical methods to analyze and integrate mammographic, sonographic, and magnetic resonance findings. These methods are based on developing familiarity with specific mammographic, sonographic, and magnetic resonance image patterns. After a radiologist is familiar with these patterns, the imager can approach mammographic, sonographic, and magnetic resonance lesions in a systematic manner and reach a logical assessment. To facilitate this process, imaging chapters 5–34 of this book are devoted to providing visual examples of these mammographic, sonographic, and magnetic resonance patterns.

Unlike mammography, sonography, and magnetic resonance imaging, positron emission tomography (PET) is currently utilized for patients with extensive disease, so this technique is treated independently. This book addresses the most common applications of PET in breast cancer (chapter 4) and illustrates these applications with clinical cases, which commonly also involve other modalities (chapters 35–40).

Because most breast problems initially present with a mammographic examination, the imaging chapters 5–34 are organized by specific mammographic findings according to the table of contents. Each mammographic pattern is illustrated by a variety of benign and malignant entities. Furthermore, the introduction of each chapter schematically illustrates the clinical approach to analyzing the mammographic abnormality. Since the clinical scenarios for PET are commonly different from those of mammography, imaging chapters 35–40 are devoted to illustrating applications of PET.

This book further promotes the goal of emphasizing the multidisciplinary nature of breast imaging by providing a framework of clinical indications for the modalities as illustrated by clinical cases. This multidisciplinary approach is emphasized by the Pattern Approach to Breast Sonography Contents and the Pattern Approach to MRI

Contents that organize the individual cases into sonographic and MRI patterns. Furthermore, the cases in this book include multiple imaging modalities such as magnetic resonance and various nuclear medicine techniques. The utility of these modalities is discussed in the context of common clinical problems that are illustrated in the individual imaging cases.

The second purpose of this book is to demonstrate the importance of high-resolution sonography in breast imaging. Sonographic examination of the breast has become more important in breast imaging. As equipment improves, imagers are able to see lesions that previously were not visible sonographically. This improved detection not only enhances one's confidence in finding malignancies earlier, but also in identifying benign lesions. However, the potentially important contribution of sonography is greatly hindered by inadequate equipment, suboptimal imaging technique, and inconsistent operator training. Several cases show images of the same lesion with both high- and low-resolution equipment. These cases also demonstrate the importance of utilizing high-contrast, post-processing techniques in the detection of benign and malignant entities. Hopefully, this book will enhance the sonographic skills of breast imagers by encouraging the use of high-quality, high-resolution equipment and optimal technique. Furthermore, by reviewing the sonographic appearance of the numerous breast abnormalities presented in this book, one can broaden one's visual sonographic experience.

The final objective of this book is to provide an atlas of a wide variety of pathologic entities within the breast. This book includes both unusual mammographic and sonographic appearances of common pathologies, as well as examples of rare breast abnormalities. By grouping the pathologies within mammographic imaging patterns, one can use this book as a base for developing differential diagnoses.

In summary, I hope this book is used both as a quick reference guide to review the schematic work-up of a particular mammographic finding, as well as a more detailed reference to study methods to optimize sonographic technique and integrate alternative imaging modalities.