Myocardial Perfusion Imaging – Beyond the Left Ventricle

Pathology, Artifacts and Pitfalls in the Chest and Abdomen

M. Elizabeth Oates
Vincent L. Sorrell

EXTRAS ONLINE

Springer

Myocardial Perfusion Imaging - Beyond the Left Ventricle

M. Elizabeth Oates • Vincent L. Sorrell

Myocardial Perfusion Imaging - Beyond the Left Ventricle

Pathology, Artifacts and Pitfalls in the Chest and Abdomen

Springer

M. Elizabeth Oates
Division of Nuclear Medicine and
Molecular Imaging
Department of Radiology
University of Kentucky
Lexington, Kentucky
USA

Vincent L. Sorrell
Division of Cardiovascular Medicine
Department of Internal Medicine
Gill Heart Institute
University of Kentucky
Lexington, Kentucky
USA

Videos to this book can be accessed at http://link.springer.com/book/10.1007/978-3-319-25436-4

ISBN 978-3-319-25434-0 ISBN 978-3-319-25436-4 (eBook)
DOI 10.1007/978-3-319-25436-4

Library of Congress Control Number: 2016941597

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG Switzerland

Dr. Oates acknowledges the invaluable help of her staff (notably, Lisa Cunningham, Joyce McCown, Sharon Rayburn, and Jeff Richards) during the preparation of this book. I thank the many nuclear technologists at the University of Kentucky and other academic medical centers with whom I have worked throughout my career, for they are the ones who create the images for us to make critical diagnoses for our patients. This book is a tribute to the patience and support of my husband and children who sustain me. To the Winfreys: Don, Victoria, Olivia, and Cecilia, thank you!

Dr. Sorrell recognizes the consistent efforts by the residents and fellows in training to learn the techniques necessary to become competent and then expert in nuclear cardiology. It is these efforts that fuel the energy necessary to spend hours teaching, mentoring, and writing books such as this one. Most importantly, it is our families who support these choices and sacrifice so many evenings and weekends. To Mandy, Zoe, and Jack, thanks again. P.S., I will be late for dinner.

Drs. Oates and Sorrell extend their deepest gratitude to Paul Anaya, M.D., Ph.D., Associate Professor of Medicine, Division of Cardiovascular Medicine, Department of Internal Medicine, Director of Nuclear Cardiology, Gill Heart Institute, University of Kentucky, for his careful and insightful critique of the manuscript and its figures.

Foreword

Myocardial Perfusion Imaging – Beyond the Left Ventricle. Pathology, Artifacts and Pitfalls in the Chest and Abdomen by Oates and Sorrell is a new addition to the many books that have been published on the subject of nuclear cardiology. This however is one contribution that simply must be among whichever others a nuclear cardiology lab chooses to use for reference. Certainly, no teaching facility should be without it. It distinguishes itself in several important respects. First, it is an e-book, so that the reader sees both static and dynamic data as it would look on the interpretive computer screen. Second, it focuses on "all the other things" that are commonly seen in a contemporary myocardial perfusion imaging study, even when performed with CT for attenuation correction. No other resource that I am aware of covers this increasingly important aspect of study interpretation. Third, it is both comprehensive and detailed, devoting separate chapters to each of numerous organs within the field of view of a myocardial perfusion study. Most nuclear cardiologists will not need to know how to differentiate appearances of various types of organ abnormality, but this book is excellent in showing what is normal and what is not, as well as documenting the various possibilities that need to be considered. Fourth, the references are an important resource for those who want to go to some primary descriptive data and investigations. Fifth, the combined expertise of a nuclear cardiologist and a nuclear radiologist provides a unique perspective on what to look for, how to describe the findings, and the diagnostic significance. Finally, an especially important aspect of this book is that the authors offer helpful reporting recommendations in each chapter to assist with how to communicate these non-cardiac findings in a way that the referring physician can know how or whether further investigation should be undertaken.

There are nearly 30 well-illustrated and well-referenced chapters, including hundreds of high quality, state-of-the-art figures and cine images. This book is organized to provide an interactive format, including many annotated videos, that allows the reader to learn as if "at the workstation" alongside an expert teacher. A particular strength of this novel e-book is the set of 36 "real-life" challenging cases in the last three chapters that one can work through to self-assess recognition and interpretation of the many common and uncommon findings within the imaging field of view.

The final three chapters increase in difficulty from 12 relatively simple, straightforward case examples to 12 moderately difficult and then 12 expert level illustrations.

This book should be kept nearby for easy access during routine cardiac SPECT MPI interpretation sessions. Mine is one teaching lab that will require this e-book to be read by all rotating cardiology fellows and radiology residents. My bet is that this will be the most popular among the other "required reading" books.

Timothy M. Bateman, MD
University of Missouri – Kansas City School of Medicine
Missouri, USA

Preface

This book presents a dedicated, comprehensive review of incidental pathology, imaging artifacts, and interpretative pitfalls apart from the left ventricle on conventional nuclear stress single-photon emission computed tomography (SPECT) myocardial perfusion imaging, the most commonly performed diagnostic test for the most common cause of morbidity and mortality in the world today (i.e., coronary artery disease).

With its systematic approach, it serves as an image-rich resource (including many cinematic images) and self-assessment guide for practicing physicians and trainees (including cardiologists, nuclear medicine physicians, and diagnostic radiologists) as well as nuclear technologists and students.

Readers will learn to identify a wide variety of "hot" and "cold" physiologic or pathologic findings in the chest ("above the diaphragm") and in the abdomen ("below the diaphragm") that might be encountered in daily practice. While some may be clinically relevant and related to the reason for the imaging examination, others are incidental, with or without clinical ramifications. Readers will be able to recognize typical confounding artifacts that may appear "hot" or "cold" on the raw (unprocessed) and processed SPECT images and, in so doing, can avoid potential interpretative pitfalls.

The two authors—a nuclear radiologist and a nuclear cardiologist—have many years of clinical experience with all cardiac radiopharmaceuticals, different gamma camera systems, and a vast array of clinical cases.

Contents