

Preface
Cardiac Imaging



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Guest Editors

It is our pleasure to present this issue of the *Radiologic Clinics of North America* at a critical time for cardiovascular radiology. Radiologists have always played a central role in the development of angiocardiology and nearly all other cardiac diagnostic imaging modalities. However, during the past quarter of a century, cardiologists have dominated these procedures. This is due in part to the disproportionate funding of cardiology training grants from the National Institutes of Health. Furthermore, the growth of cardiology training programs and cardiologists trained in imaging has increased self-referral of patients for cardiac imaging. This has resulted in the progressive erosion of cardiac radiology training. Whereas divisions of cardiac radiology were once thriving in academic centers, decreased patient volume resulted in decreased stimulus and interest in learning or teaching in a field that appeared to exclude radiologist involvement. Today, most radiology training programs have no structured programs in cardiac imaging, and most radiology departments have no fellowship-trained cardiac radiology faculty.

In the past decade, CT and MR imaging have become the dominant diagnostic methods used for nearly all medical specialties, with the exception of heart disease. Recent technologic innovation, resulting in high speed electrocardiogram-gated CT and

MR imaging, now allows use of these imaging modalities for evaluation of the heart. This is the good news. The bad news is that there is now an enormous gap between the growth of this new technology for the diagnosis and management of patients with heart disease, and the poor knowledge base obtained by radiologists lacking any clinical experience in cardiac anatomy, physiology, pathology, and imaging.

This issue attempts to illustrate how this gap can be narrowed. The plain chest radiograph is discussed by Drs. Lipton and Boxt in the first article. Plain film examination has been neglected, yet it provides the most rapid, cost-effective, and safest screening and diagnostic procedure for identifying and characterizing pulmonary and cardiac pathology. The heart is displayed in every chest radiograph, which provides a daily exercise for radiologists in evaluating cardiovascular disease. Furthermore, it is central for understanding the morphologic and physiologic changes reflected in CT and MR examinations. It is for these reasons, and because all thoracic and general radiologists feel comfortable with plain films, that this is a place to begin relearning the basics of cardiac diagnosis. This article emphasizes the importance of a consistent and systematic approach for analyzing the heart. It also reminds everyone of the normal cardiac

anatomy and geometry of the cardiac silhouette. A segmental approach is described for the various cardiac borders and their structural relevance. Examples illustrate how such a logical scheme enables the observer to reach a differential diagnosis.

This basis is complemented by Dr. Duerinckx in the next article, which follows and correlates plain films with MR examination in patients who have heart disease. It provides excellent illustrations and examples of classical heart disease findings in the adult. In the next article, Dr. Boxt describes how cardiac calcification can be of critical diagnostic value, which also reinforces the anatomy of cardiac structures. Dr. Kazerooni and colleagues then describe the postoperative chest and how imaging can resolve causes of chest pain. The broad spectrum of postoperative radiographic findings are illustrated by chest films and CT.

The article by Dr. Woodard describes how to perform a cardiac MR examination. Now that the reader is comfortable in understanding the normal cardiac structures, it will be easier to focus on the clinical aspects of cardiac MR imaging. Dr. Tatli and company then describe imaging of thoracic aortic disease. This is a critical area and is often associated with emergency room medicine and serious clinical and medico-legal implications. Detailed MR and CT methodology is discussed and illustrated for the practicing clinical radiologist. Pitfalls and key diagnostic points are reviewed.

Dr. Rienmueller and colleagues provide an in-depth review of another important and often misunderstood area: the pericardium. The diagnosis of constrictive pericarditis using CT and MR imaging is reviewed and illustrated. The important role the radiologist can play is emphasized with regard to guiding the surgeons approach and improving patient prognosis.

Dr. Wolfe and colleagues review MR imaging in ischemic heart disease. The great value of MR in identifying viable pericardium as well as perfusion

studies are clearly described and illustrated. This area is one of the fastest growing clinical applications for cardiac MR. Nuclear imaging including CT/positron emission tomography is elegantly reviewed and illustrated in the following article by Dr. Coulden and colleagues.

Dr. Schoepf discusses the technical aspects and value of CT for examining the coronary arteries, showing how CT can display not only normal vessel lumens, but also arterial stenosis and intravascular stents. In addition, the appearance of plaque progression is demonstrated and discussed. Finally, Dr. Baron illustrates the value of imaging in congenital heart disease in adults. Adult patients with congenital heart disease are becoming increasingly more common as early diagnosis and surgical and medical management improves outcome in these individuals.

This issue provides a comprehensive overview of the contributions radiologists can make in the diagnosis of heart disease. It will also assist the general radiologist to feel more comfortable in interpreting and performing noninvasive studies of the thorax.

We are indebted to the very talented individuals who gave their precious time to prepare their respective articles. We hope that readers will find this issue enjoyable and useful in their radiology practices. Finally, our thanks to Barton Dudlick of Elsevier, who supported this project and exhibited the patience of a saint.

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