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Preface

Imaging modalities in general thoracic surgery

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Guest Editors

This issue of the *Thoracic Surgery Clinics* is dedicated to thoracic imaging with emphasis on the recent advances and their relevance to the general thoracic surgeon. Foremost among these advances are the dramatic improvements in cross-sectional imaging, particularly as they apply to CT scanning. Multislice scanners have now largely replaced the single slice scanners of the early 1990s, allowing for faster image acquisition and higher spatial resolution. Image acquisition using 10-mm slice thickness has now given way to 0.675-mm slice thickness, a 15-fold increase in spatial resolution. These changes have allowed the detection of even smaller nodules and lung cancers. Alongside improved spatial resolution, computer-aided approaches are slowly entering the realm of clinical practice. Faster computers with larger image storage capacity have allowed manipulation of high-resolution data and three-dimensional display. Computer-aided diagnostic techniques enhance nodule detection, analysis, and growth rates as well as detection of pulmonary emboli.

In this issue, we admittedly pay special attention to CT and its pivotal role in thoracic imaging. This relates to issues such as lung cancer screening and staging and the diagnosis of pulmonary emboli. We also have included articles on the future of CT scanners and image processing techniques that demonstrate where we can expect the intersection of these technologies to lead.

Although CT imaging plays an important role, it is by no means an exclusive one, and many other technologies have advanced and become quite useful. MRI, which is most useful in tissue characterization, is discussed with emphasis on its role in the staging of tumors both in the lung and the mediastinum. Currently, MRI plays mainly a complementary role to CT; however, rapid advances in this technology are occurring as well, and its role in imaging of pulmonary emboli may soon surpass CT.

In selecting contributions to this issue, we chose to include articles that give state-of-the-art reviews on the clinical role of various imaging procedures in common thoracic surgical problems. We have also included articles on specific imaging techniques that have emerged and are now becoming readily available; this includes various endoscopic techniques such as virtual bronchoscopy and laser-induced fluorescence endoscopy (LIFE) bronchoscopy for the airways, as well as chromo and magnification endoscopy for the esophagus. These powerful new imaging techniques have already found their way into clinical practice, and these articles discuss their respective advantages and limitations. We also included an article on radiolabeled imaging for thoracic tumors.

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Although positron emission tomography using fluorodeoxyglucose (FDG) is the primary agent currently used, this entire field is changing rapidly. New targeted diagnostic and therapeutic agents are being developed. This field will be best positioned to leverage the advances in molecular biology and incorporate this into sophisticated imaging strategies.

The changes that have occurred in the past 10 years have indeed been dramatic. Diseases are being diagnosed earlier, allowing for development of new therapeutic strategies. In addition, the thoracic surgeon can now plan for more complex procedures. Combining the advances in imaging technology with advances in therapeutics will undoubtedly have a major impact on the practice of thoracic surgery.

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