Exciting Advances in the Pathogenesis of Neoplastic and Nonneoplastic Lung Diseases, Their Diagnosis, Prognosis, and Treatment

Anja C. Roden, MD

The 10th Biennial Pulmonary Pathology Society (PPS) meeting took place June 13–17, 2017, at the Gleacher Center, University of Chicago (Chicago, Illinois). It was attended by participants from 26 countries and 6 continents including Africa, North and South America, Asia, Australia, and Europe. Under the leadership of Timothy C. Allen, MD, JD (course director), Aliya Husain, MD (event coordinator), and Philip T. Cagle, MD (program director), this international forum provided state-of-the-art updates on new technologies, procedures, and classifications in the imaging, diagnosis, and molecular testing of pulmonary diseases.

The meeting included recent developments in pathogenesis, diagnosis, prognosis, and targeted treatment-related tests of neoplastic and nonneoplastic lung diseases. For instance, presentations focused on recent changes in lung cancer staging, screening, and treatment. Theranostic biomarkers, such as immune checkpoint inhibitors, particularly programmed death ligand-1, but also other emerging biomarkers for lung cancer were discussed. Data on next-generation sequencing (NGS) of lung cancer and lung cancer diagnosis using circulating tumor cells and cell-free tumor DNA were presented. An update on College of American Pathologists/International Association for the Study of Lung Cancer/Association for Molecular Pathology lung cancer predictive biomarker guidelines was also provided. In addition, diagnostic considerations and biomarkers of malignant pleural mesothelioma and features of pleural tumors other than malignant mesothelioma were presented.

A large part of the meeting was devoted to nonneoplastic lung disease and recent developments and advances in their diagnosis and treatment. Presentations about the clinical application of genomics to pulmonary infection, updates on hypersensitivity pneumonitis, rare idiopathic interstitial pneumonia, biomarkers and molecular therapy for pulmonary fibrosis, Mycobacterium avium complex–related airway disease, drug-related lung disease, smoking-related interstitial lung disease, biomarkers in acute lung injury, interstitial pneumonitis with autoimmune features, and pulmonary vascular disorders were only some of the highlights of the meeting. An interactive session on the multidisciplinary approach to interstitial lung disease was presented by a thoracic pathologist together with a diagnostic radiologist and a pulmonologist beautifully resembled a multidisciplinary discussion as is recommended in the diagnosis of many interstitial lung diseases.

Furthermore, emerging techniques were discussed, including NGS and molecular testing on cytology specimens, rapid on-site evaluation of endobronchial ultrasound-guided fine-needle aspirations, and transbronchial cryobiopsies in the diagnosis of interstitial lung disease and lung allograft evaluation.

All accepted meeting abstracts that have not been previously published will be included in an upcoming issue of the Archives of Pathology & Laboratory Medicine. Furthermore, review articles based on some of the lectures and an original article based on an accepted abstract will also be published as part of the PPS special section. In Part I of this special section, among the featured manuscripts, Katalin Dobra, MD, PhD, et al show, based on a large series of malignant mesotheliomas at the Karolinska University Hospital in Huddinge, Sweden, that a diagnosis of malignant mesothelioma can be achieved on cytology preparations of pleural fluid with a high positive predictive value. This can be accomplished by using the guidelines for the cytopathologic diagnosis of epithelioid and mixed-type malignant mesothelioma as stated by the International Mesothelioma Interest Group and endorsed by the International Academy of Cytology and the Papanicolaou Society of Cytopathology. Richard Attanoos, BSc, MBBS, FRCPath, and Matthew Pugh, BSc, MSc, MBCH, FRCPath, from the University of Wales and Cardiff University, United Kingdom, review the morphologic features, immunophenotypical and genetic characteristics, and biomarkers of primary pleural tumors other than malignant mesotheliomas, including solitary fibrous tumors, desmoid-like fibromatosis, synovial sarcoma, and lymphomas, among others. Alain C. Borczuk, MD, from Weill Cornell Medicine, New York, New York, discusses the gross, microscopic, and molecular features of uncommon types of lung carcinoma with mixed histology, such as sarcomatoid carcinoma, adenosquamous carcinoma, and mucoepidermoid carcinoma, and how to distinguish these entities from their morphologic mimickers. The correct
diagnosis of these tumors is important, as they possess specific clinicopathologic characteristics and molecular alterations. Peter P. Luk, MBBS, Wendy Cooper, MBBS, PhD, and colleagues from Royal Prince Alfred Hospital and University in Sydney, Australia, provide an update on biomarkers for ALK and ROS1 in lung cancer by immunohistochemistry and fluorescence in situ hybridization. An original article is provided by Melanie Bois, MD, et al, from the Mayo Clinic, Rochester, Minnesota, featuring morphometric studies of pulmonary arterial changes in pulmonary Langerhans cell histiocytosis (PLCH). The authors show significantly more myointimal thickening of pulmonary arteries that are located within PLCH lesions in comparison with pulmonary arteries of PLCH patients that are in nonlesional areas of the lung. In addition, the pulmonary arteries in nonlesional areas of PLCH lungs have significantly more myointimal thickening when compared with pulmonary arteries of age-, sex-, and smoking-matched controls.

Part II of this special section in the September 2018 issue will begin with an article from Sanjay Mukhopadhyay, MD, and Atul Mehta, MD, from the Cleveland Clinic, Cleveland, Ohio. The authors describe the utility of core needle biopsies and transbronchial biopsies for diagnosing nonneoplastic lung diseases. They conclude that these biopsies, even though small, can contribute to the diagnosis of a variety of nonneoplastic lung diseases and reduce the need for invasive surgical intervention. The article also provides practical tips on clinicopathologic correlation. Tomonori Tanaka, MD, and Kadori Ishida, MD, from Kindai University (Osaka, Japan) and Nagasaki University (Nagasaki, Japan), provide an update on rare idiopathic interstitial pneumonias, including lymphoid interstitial pneumonia and pneumo-parenchymal fibroelastosis, and on rare histologic patterns such as acute fibrinous and organizing pneumonia and bronchiocentric patterns of interstitial pneumonias. Ellen Caroline Toledo do Nascimento, MD, PhD, et al, from the Universidade de Sao Paulo, Sao Paulo, Brazil, describe morphologic aspects of interstitial pneumonia with autoimmune features. Interstitial pneumonia with autoimmune features designates an interstitial lung disease with features that are suggestive but not diagnostic of a definite connective tissue disease. Francesca Lunardi, PhD, and Fiorella Calabrese, MD, with colleagues from the University of Padova Medical School, Padova, Italy, review experimental studies concerning antifibrotic treatments in idiopathic pulmonary fibrosis.

During the meeting, Thomas V. Colby, MD, who served as the first president of the PPS, beginning his term in 1995, was honored with the PPS Lifetime Achievement Award in appreciation of his outstanding contributions to science and education in pulmonary pathology.

We are looking forward to our next biennial PPS meeting, June 26–28, 2019, in Dubrovnik, Croatia.