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Preface: Cytopathology: Diagnostic Updates and Advances in Ancillary Testing xi

Vickie Y. Jo

Updates in Thyroid Cytology 467

Michiya Nishino and Jeffrey F. Krane

Genomic, clinical, and pathologic studies have prompted a more risk-stratified approach to the management of patients with thyroid nodules. The recent nomenclature change concerning noninvasive follicular thyroid neoplasm with papillary-like nuclear features reflects the clinical trend toward conservative treatment choices for carefully selected low-risk thyroid neoplasms. These developments have occurred in parallel with a growing array of molecular tests intended to improve clinical triage for patients with indeterminate fine-needle aspiration diagnoses. This article discusses the implications of the nomenclature revision on the interpretation of thyroid fine-needle aspiration and updates available on ancillary molecular tests for thyroid fine needle aspirations.

Updates in Salivary Gland Fine-Needle Aspiration Biopsy: The Use of the Milan System and Ancillary Testing 489

Edward B. Stelow

Salivary gland fine-needle aspiration biopsies remain common specimens seen by most cytology services. The diagnostic diversity and overlap between many of the lesions seen with these biopsies impart many challenges for the cytopathologist, rendering most specific diagnoses impossible with cytology alone. Here, the use of the Milan System for the classification of salivary gland fine-needle aspiration biopsy is discussed, together with the potential use of ancillary testing in arriving at definitive diagnoses.

Head and Neck Cytopathology: Human Papillomavirus-Positive Carcinomas, Including Diagnostic Updates, Testing Modalities, and Recommendations 501

Emilio Madrigal, Justin A. Bishop, and William C. Faquin

Oropharyngeal squamous cell carcinoma caused by transcriptionally active human papillomavirus (HPV) is now well established as a unique form of head and neck cancer. Given the high frequency of metastasis to cervical lymph nodes by HPV-positive oropharyngeal squamous cell carcinomas, fine-needle aspiration (FNA) represents a widely accepted method for the sampling and diagnosis of these cancers. The recently published College of American Pathologists Guideline (2017) provides recommendations for the effective performance and interpretation of high-risk (HR) HPV testing in head and neck squamous cell carcinoma (HNSCC), including testing on FNA samples of metastatic HNSCC to cervical lymph nodes. There is a wide range of options available for HR-HPV testing in cytologic specimens.

Updates in Lung Cancer Cytopathology 515

Paul A. VanderLaan

Lung cancer diagnosis and ancillary testing are increasingly relying on cytology and small biopsy specimens obtained via minimally invasive means. Paired with

traditional immunohistochemical characterization of tumors, biomarker testing and comprehensive genomic profiling are becoming essential steps in the workup of lung cancer to identify targetable alterations and guide optimal therapy selection. Recent advances in immune checkpoint inhibitor therapy have led to an increasingly complex and unresolved landscape for tumor PD-L1 testing. The prevalence and importance of lung cancer cytology specimens are growing, with more required by the cytopathologist in directing the care of patients with lung cancer.

Updates in Effusion Cytology

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Christin M. Lepus and Marina Vivero

Effusion cytology plays multiple roles in the management of benign and malignant disease, from primary diagnosis to tissue allocation for ancillary diagnostic studies and biomarker testing of therapeutic targets. This article summarizes recent advances in pleural effusion cytology, with a focus on the practical application of immunohistochemical markers, cytogenetic techniques, flow cytometry, and molecular techniques for the diagnosis and management of primary and secondary neoplasms of the pleura.

Evaluation of Carcinoma of Unknown Primary on Cytologic Specimens

545

Erika E. Doxtader and Deborah J. Chute

Carcinoma of unknown primary is defined as metastatic carcinoma without a clinically obvious primary tumor. Determining the tissue of origin in carcinoma of unknown primary is important for site-directed therapy. Immunohistochemistry is the most widely used tool for the workup of metastases, but molecular profiling assays are also available. This article provides an overview of immunohistochemical stains in the workup of metastatic carcinoma, with a focus on newer site-specific markers, and discusses the role of gene expression profiling assays for determining the tissue of origin. The utility of cytopathology specimens in the evaluation of carcinoma of unknown primary also is highlighted.

Pancreatic Cytology

563

Raza S. Hoda and Martha B. Pitman

The diagnostic approach to pancreaticobiliary disease requires a multidisciplinary team in which the cytopathologist plays a crucial role. Fine-needle aspiration, obtained by endoscopic ultrasonography, is the diagnostic test of choice for pancreatic lesions. Preoperative clinical management depends on many factors, some of which rely on accurate cytologic assessment. Pancreaticobiliary cytology is wrought with diagnostic pitfalls. Clinical history, imaging studies, cytology samples, and ancillary tests, including immunohistochemistry, biochemical analysis, and genetic sequencing, are integral in forming a complete diagnosis and guiding optimal patient management. This article reviews the clinical aspects and diagnostic workup of common diagnostic entities within the field of pancreaticobiliary cytology.

Updates in Cervical Cytology: The 90-Year-Long Journey from Battle Creek to Today

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Catherine J. Roe and Krisztina Z. Hanley

Ninety years ago, at the Battle Creek conference, Papanicolaou introduced cervical exfoliative cytology. Since then, the “Pap test” has come a long way. The discovery

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