Cytopathology in focus: Serous fluid cytology and the international system

Last bastion in cytopathology standardization

Barbara A. Crothers, DO
Daniel F.I. Kurtycz, MD; Ashish Chandra, MD
Fernando Schmitt, MD, PhD

January 2019—Just when you thought you were done implementing a new terminology for cytology, another one pops up.

Is it possible there are sites that have not yet been standardized? Unbelievably, the most common nongynecologic cytology specimen, body fluids, remains a Wild West for terminology, and the International Academy of Cytology and American Society of Cytopathology are collaborating to improve consistency and understanding for serous fluid cytology reporting by developing The International System for Reporting Serous Fluid Cytology, or TISRSFC.

The intention is to produce an atlas with text similar to those published for existing cytopathology terminology: the Bethesda systems for reporting cervical cytology and thyroid cytopathology, the Milan System for Reporting Salivary Gland Cytopathology, the Papanicolaou Society of Cytopathology systems for reporting pancreaticobiliary cytology and respiratory cytology, the Paris System for Reporting Urinary Cytology, and the future Yokohama System for Reporting Breast Cytopathology.

To align with precedent cytology terminology systems, the proposed categories for the new system for serous fluid cytology will be non-diagnostic (ND), negative for malignancy (NFM), atypia of uncertain significance (AUS), suspicious for malignancy (SFM), and malignant (MAL). Additional special sections will address cytopreparatory techniques, quality assurance, and issues related to peritoneal washings and mesothelioma.

Creating standardized terminology for serous fluid cytology is not without its challenges. Serous effusions are often evaluated for metastases and there are many diagnostic possibilities for metastatic tumors, involving many different body sites. Fortunately, pathologists are equipped with special stains and immunocytochemistry and molecular tests that can specifically characterize most metastatic tumors, and this will be a particular focus of this effort. AUS and SFM can be considered preliminary categories that are reported as a last resort, when all possible subsequent studies cannot define the disease process. The proposed publication will provide the reader with an approach to metastases using ancillary studies and clinical information.

Another confusing area in serous fluid cytology is the presence of epithelial cell groups in peritoneal washings. In some cases, these are benign Müllerian-origin cells exfoliated by abrasive procedures or saline jet streams projected against the peritoneal surfaces. They may be spontaneously exfoliated from proliferative processes such as endometriosis and endosalpingiosis. Benign and malignant cells may be introduced by virtue of operative procedures that result in expulsion of cells from the endometrium into the peritoneal cavity. There is little data on the reporting of, and outcomes for, these findings, and this will be a task for the international system team to unravel.

Why, you may ask, is a new terminology system necessary? First, let us explore prior medical advances that have been made with implementation of standardized cytology terminology, using as an example The Bethesda System for Reporting Cervical Cytology (TBS). As the first standardized terminology adopted by the cytopathology community, TBS has remained a cornerstone and the model for subsequent terminology systems. It is widely accepted and, in some cases, is a requirement for medical publication in the United States. TBS has allowed for relatively reliable and consistent comparison of published study results—reliable in that the criteria for each category are outlined and consistent because it is the preferred terminology. Understandably, there are still

uncontrolled subjective variables with the interpretation of cells that will never be standardized, but coming as close as possible to agreement in diagnosis is always a goal in medicine.

Second, standardization has permitted national practice guidelines for the follow-up of cytologic abnormalities to be implemented. This is possible only when cytology is reported consistently with standardized terminology, which takes the guesswork out of the meaning of the pathologist's interpretation of the findings. Monitoring the outcomes of national practice guidelines has made it possible to modify the guidelines to improve patient care.

Third, it permits educators to teach appropriate clinical care by referencing a specific set of findings rather than myriad descriptive pathology terms. For Pap tests, it is much easier to teach appropriate follow-up for "atypical squamous cells of undetermined significance" (ASC-US) than for terms such as "mild cytologic atypia," "koilocytic atypia," and "minor nuclear membrane irregularities with slight hyperchromasia." These are actual terms that were used in Pap test reporting before TBS was implemented. A major problem prior to TBS was that pathologists had a multitude of terms for atypia, some of which were mistaken for dysplasia and many of which were poorly understood or misconstrued. No one expects physicians to understand descriptions of cytologic findings without an interpretation, and often health care workers such as physician assistants, nurse practitioners, nurses, and administrative staff are even less equipped to understand the nuances of pathology reporting.

Fourth, patients are entitled to copies of their medical records, including reports, and, as partners in their health care, they should be presented with clear, concise interpretive language that they can investigate on the Internet. A diagnosis should be easily understood by other pathology practices that might be consulted to review those patient results, as well as other health care providers from institutions outside the patient's health care network.

Finally, standardization facilitates data collection and compilation that can contribute to public health by tracing disease incidence and prevalence. In our digital age, standardization can also promote efficiency by preformatting diagnoses into laboratory information systems. This facilitation has enabled the cytopathology community to make significant inroads into practice improvement by monitoring individual rates of Pap test ASC-US to squamous intraepithelial lesion (ASC:SIL) ratios and diagnostic rates of individuals to the laboratory as a whole. These comparisons are possible only when there is agreement on terminology and the assignment of interpretation to specific categories.

The beauty of subsequent cytology terminology systems after TBS is that most were modeled after that system and used similar terminology. This promotes health care community understanding of pathologic interpretation of cytology by clarifying, across organ systems, what is implied by "atypia of undetermined significance" and "suspicious for malignancy." How often have pathologists witnessed their interpretation of "suspicious for malignancy" end up as a definitive "malignant" interpretation in a patient's medical record? With consistent reporting systems and clear terminology, we can convey more succinctly the uncertainty of an "atypical" or "suspicious for" diagnosis.

To discover current serous fluid reporting practices and promote pathology community involvement in creating the terminology, the International Academy of Cytology and American Society of Cytopathology have launched international online surveys through pathology organization websites and are in the process of compiling the results. The cytopathology community has been an innovator and trendsetter in pathology terminology standardization, and the job is nearly complete. Serous fluid cytopathology is one of the last frontiers for terminology, and is too important to patient care to be left behind.

Dr. Crothers, former chair of the CAP Cytopathology Committee, is associate professor of pathology, Uniformed Services University of the Health Sciences, and senior consultant for gynecologic, breast, and cytopathology, Joint Pathology Center, Silver Spring, Md. Dr. Kurtycz is professor of pathology, Department of Pathology and Laboratory Medicine, University of Wisconsin School of Medicine and Public Health, Madison. Dr. Chandra is lead consultant for cytopathology and urological histopathology, St. Thomas' Hospital, London, England. Dr. Schmitt is professor of pathology, Porto University Medical School, Unit of Molecular Pathology, Porto, Portugal.