

FOCUS

PAPANICOLAOU SOCIETY OF CYTOPATHOLOGY

Companion Society of the United States and Canadian Academy of Pathology



Dedicated to Clinical Practice, Clinical Education and Clinical Research

From the Editor's Desk

Vinod B. Shidham, MD, FRCPath, FIAC



Dear colleagues, I thank our co-editor Andrew Fischer for pitching in and organizing the initial stages of this issue during my transition to Wayne State University School of Medicine & Detroit Medical Center at Detroit.

We have exciting articles on recent technologies potentially affecting our profession in the coming years. As usual very informative and insightful humanities corner edited by Manon Auger would be interesting for all the readers. The details about various benefits of joining PSC membership are highlighted on the last page. Please recommend to your colleague to join PSC membership by sending the membership form downloaded from <http://www.papsociety.org/docs/09/pscapp2009.pdf>

Members and other readers are encouraged to send the articles or other contributions (eg. interesting images in cytology, book reviews, case reports, reviews etc) to me or any of the Focus editorial board members. We are accepting contributions for the December 2010 edition. The deadlines for submitting the contributions are flexible. It is preferable to submit by April 15th for June issues and before October 15th for December issues.

Sincerely,

Vinod B. Shidham, MD, FRCPath, FIAC

APSC President's Message

Martha Bishop Pitman, M.D.



The 2009-2010 year calendar year for the PSC was one full of exciting and innovative events for the organization. The PSC Scientific Program

Committee chaired by Dr. Zubair Baloch, hosted the first joint scientific program session with the American Society of Cytopathology. This two evening symposium presented a comprehensive exploration of the current state of the art of thyroid FNA beyond the NCI State of the Science Conference held in October 2007. Together with Dr. Syed Ali, chair of the scientific program committee of the ASC, Dr. Baloch is hard at work on the second joint session to be held in Boston.

The PSC sponsored panel luncheon at the ASC annual meeting in Denver, Nov. 2009, like the previous PSC sponsored panel luncheons, was a sold out venue. Drs. Susan Rollins and Britt-Marie Ljung moderated a workshop on pathologist's

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The Humanities Corner

By Manon Auger, MD, FRCP(C)
McGill University Health Center and McGill University

Where do these eponyms come from?

Curshmann spirals ^(1,2)

These inspissated mucus strands are named after the German physician Heinrich Curschmann (1846-1910; Fig.1) who first described these spirals in sputa from asthmatic patients. He was an internist who worked in Berlin, Hamburg, and at the University of Leipzig. His most notable achievement was a collection of photos, his "Klinische Abbildungen" (Clinical Illustrations), illustrating the external changes of the body in response to internal diseases, considered a ground-breaking achievement in medical photography.

Charcot-Leyden crystals ⁽³⁻⁶⁾

The first half of the eponym given to these bipyramidal-shaped crystals, which are considered a morphologic hallmark of eosinophil-related disorders, relates to Dr. Jean-Martin Charcot (1825-1893; Fig.2), a renowned French neurologist and professor of anatomical pathology, often referred to as the founder of modern neurology. In collaboration with Charles-Philippe Robin, he described these crystals in 1853. Dr. Charcot was famous for his systematic use of pathology to complement his rigorous clinical analysis of neurological disorders and became recognized as an important anatomico-pathologist.

In addition to the crystals bearing his name, he is associated with at least 15 other medical eponyms including Charcot joint (diabetic arthropathy), Charcot disease (amyotrophic lateral sclerosis), Charcot-Marie-Tooth disease (peroneal muscular atrophy) and Charcot-Bouchard aneurysms (tiny aneurysms of cerebral arteries in hypertensive patients).

Dr. Charcot is also famous for his students which included, among others, Sigmund Freud, Joseph Babinski, Charles-Joseph Bouchard and Georges Gilles de la Tourette. Of interest, an island in Antarctica was named in his honor by his son, Jean-Baptiste Charcot, a very successful explorer. Incidentally, there are many geographic arctic and Antarctic geographic landmarks named after the son (e.g., Charcot Cove, Charcot Cape).

The second half of the eponym refers to Dr. Ernst Viktor von Leyden (1832-1910; Fig.3) who re-described the crystals in 1872. Dr. Leyden was a German internist from Danzig who, like Charcot, was specialized in neurological science. He became a leader in establishing proper hospital facilities for tuberculosis patients. Other medical eponyms bearing his name include Leyden's neuritis (fatty replacement of nerve fibers) and Leyden-Mobius syndrome (pelvic muscular dystrophy).

Ironically, the famous crystals were first noticed by neither Charcot nor Leyden, but by Friedrich Albert von Zenker.

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Book review

The immortal life of Henrietta Lacks

by Rebecca Skloot. Crown publishers, New York. 2010, 370p.

This is a fascinating account of the true, behind-the-scene story of the famous HeLa cell line, named after Henrietta Lacks. Cells taken from biopsies of her cervical cancer at the time of the original diagnosis and during her autopsy a few months later in 1951, at Johns Hopkins, are the sources of the first immortal human cell line, the HeLa.

This book reads like a detective novel and is chock full of captivating details on the far reaching uses---ethical, and less ethical--- of this cell line in research, including its crucial roles, among others, in the development of the polio Salk vaccine and of gene mapping as well as on the evaluation of the cellular effects of the atomic bomb and of extreme gravity (for which the cells were sent into outer space). HeLa remains one of the most regularly used cell lines in laboratories in the world and over 60,000 scientific publications relate to experiments involving HeLa cells.

Most importantly, this book puts a face on Henrietta Lacks, a woman who unknowingly through her cells had a tremendous impact on science. She was a descendant of slaves, a poor Southern black tobacco worker, who died at the age of 31, leaving her 5 children motherless. The author poignantly tells the struggles of her children and grand-children with the legacy of her cells, the existence of which came to light a full two decades after her death.

In my opinion, this is a "must-read" and I recommend it enthusiastically to anyone interested in science and its human ramifications.

Of note, the author has established a scholarship fund for the descendants of Henrietta Lacks to provide financial assistance for the education and health care services they cannot afford. Donations can be made at HenriettaLacksFoundation.org

Figure legends for The Humanities Corner

by Manon Auger, MD, FRCP(C)
McGill University Health Center and McGill University
July 2010

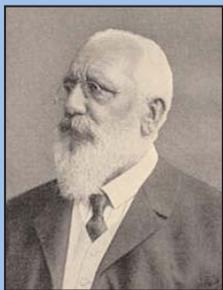


Figure 1



Figure 2



Figure 3

Figure 1: Photo of Dr. Heinrich Curschmann (1846-1910) after whom the Curschmann spirals are named. (public domain)

Figure 2: Photo of Dr. Jean-Martin Charcot (1825-1893) which is the source for the first half of the eponym Charcot-Leyden crystals (public domain)

Figure 3: Photo of Dr. Dr. Ernst Viktor von Leyden (1832-1910) which is the source for the second half of the eponym Charcot-Leyden crystals (public domain)

Con't from page 1

President's Message

utilization of ultrasound FNA in the FNA clinic. In Boston, Nov. 2010, the PSC will host another panel luncheon "Pathologist Workload Distribution in the Era of Subspecialization: What is the best indicator for determining fair allocation of surgical and cytologic specimens?" This session is moderated by Dr. Tarik Elsheikh. The speakers are Drs. Nick Agoff and Steve Black-Schaffer, who have extensive expertise on the topic, and will present their experiences from the private practice and academic settings, respectively. Sign-up early as this is surely to be another sell out!

The PSC was also represented at the International Academy of Cytology meeting held in Scotland. EB member and President-elect, Dr. Lester Layfield, and Paul Wakefield held a workshop on soft tissue tumor FNA. The PSC will also sponsor a scientific session at the European Congress in Istanbul, Turkey in September, 2011. Stay tuned to the PSC web site www.papsociety.org for details on all of these venues.

Membership benefits have been expanded. While Diagnostic Cytopathology remains the sponsoring journal of the PSC, due to the PSC's new premier stewardship status CytoJournal OA Steward-Plus with CytoJournal <http://www.cytojournal.com/OASteward.asp>, members of the PSC now can publish in CytoJournal free of charge. They also have online access and can download PDFs of articles free of charge. All articles are published in CytoJournal after double blind peer-review. They are indexed with a PMID# and archived permanently with PUBMED central to be retained in the public domain. All PSC members also qualify for subsidized annual subscription towards print copy of Cytojournal at just \$50 (Compared to regular \$375). Check it out at www.cytojournal.com. Chair, Dr. Rosemary Tambouret and members of the Membership Committee, are exploring collaborations with other print journals for benefit to the PSC members.

The EB approved a new Lifetime Achievement Award proposed by the Awards committee and chair, Dr. Andrea Abati. This new award joins the L.C. Tao Educator of the Year Award and Yolanda Oertel Interventional Cytopathologist of the Year Award to honor a cytopathologist whose long and illustrious career has been dedicated to field of cytopathology and whose contributions have had a significant impact on the field. Please join us in San Antonio when the first award will be presented at the beginning of the PSC scientific program on Sat. of the USCAP companion meeting weekend.

Our support of education in cytopathology in developing countries continues stronger than ever. Through the tireless efforts of Dr. Matt Zarka, Chair of the International Scientific Program and Relations Committee, the PSC was awarded a humanitarian grant from the CAP, not only to support the faculty of the FNA tutorials in Africa founded by EB member, Dr. Andrew Field, but to defray the expenses for the African pathologists to attend the tutorials. EB members Drs. David Chheing and Tarik Elsheikh have both been faculty in these tutorials. The continued success of the tutorials is greatly enhanced by the continued support from the PSC membership. Dr. Britt-Marie Ljung has also represented the PSC in her ventures to Ghana, Africa. See the story on page 10.

A new and exciting way PSC members can support continuing education of pathologists in developing countries is to become a "DiCy buddy". Any pathologist in a developing country unable to afford the cost of Diagnostic Cytopathology can be placed on the DiCy buddy list [in development, and soon to be available on the PSC web site]. PSC members can pick a buddy from the list and donate their hard copy of the journal to that buddy. Not only will this buddy system support education of pathologists, it will also foster relationships among pathologists all over the world.

A Virtual Slide Box is under development. This exciting venture proposed by member Dr. Carlos Bedrossian and in development with the Education and Training Committee, chaired by Dr. Aylin Simsir, will provide members with access to scanned slides of interesting and instructive cases using Arperio technology. Slides and teaching vignettes will be available for access and review via the PSC web site. This online educational venture joins the Case of the Month, also provided by the Education and Training Committee. In its final stages of completion, The Thyroid Atlas will soon be available for public access.

Please welcome President-Elect, Dr. Lester Layfield, returning EB member Dr. Tarik Elsheikh and new EB member, Dr. Phillippe Vielh of France as the PSC continues its work this year and prepares for the next PSC meeting in March 2011 in San Antonio, Tx. Check on the PSC web site www.papsociety.org for updated information.

Confocal Laser Endomicroscopy: A Threat to Pathology or a New Opportunity for Cytopathologists?

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For generations, diagnosis has relied upon the acquisition of cellular material for *ex vivo* microscopic analysis by pathologists. Given the limitations of biopsies, including cost, time delay, and risks to patients, new optical techniques are being evaluated for their ability to achieve diagnostic “biopsies” *in situ*. Confocal Laser Endomicroscopy (CLE) is a relatively new endoscopic tool that creates high-resolution, three-dimensional images of cells and tissue *in vivo*. Since CLE can display morphology of living tissues, it could even surpass the utility of standard biopsies by showing potentially dynamic types of diagnostic morphologic changes.

CLE may seem capable of making pathologists’ *ex vivo* analysis of biopsies obsolete. However, we think that CLE actually complements cytopathology and can lead to a new expanded role for cytopathologists, albeit possibly at the expense of surgical pathologists. As we will discuss, CLE can typically display tissue-level architectural changes and currently provides very limited cellular-level or nuclear imaging. Putting CLE together with cytology provides the full range of diagnostic information that can be achieved with tissue biopsies. Cytology fits the mantra of CLE’s ambition of being minimally invasive, safe and rapid. An archive of *ex-vivo* material will always be needed for immunohistochemistry and molecular diagnostic/prognostic techniques, and cytologists have the capacity to fulfill that need. In addition, sampling is still an issue with CLE, and the cytologic technique of brushings can be particularly helpful in improving sampling. Finally, cytologists are already frequently in the trenches with endoscopists during endoscopic ultrasound guided procedures, and we are in a position to use our morphologic skills to assist the endoscopists in interpreting the tissue-level morphologic findings that they encounter.

Using the basic “pin-hole” technology of bench-top confocal microscopy¹, CLE obtains images by focusing a low-powered, blue-light laser of 488nm or 660nm through an objective lens to recover reflected or fluorescently-excited light from a single plane². This basic confocal technology has been manufactured into two endoscopic platforms. The microscope is either affixed to the end of a standard endoscope (eCLE, The Pentax Corporation) or integrated into a collection of illumination fibers in a “mini-probe” head that can be passed through an endoscope channel as an accessory (pCLE, Mauna Kea Technologies). eCLE has primarily been integrated onto standard GI endoscopes and colonoscopes providing endoscopists with lateral and axial cellular resolution of 0.7µm and 7µm, respectively, along with adjustable focal depths to a maximum of 250µm into tissue. Alternatively, the trans-endoscopic pCLE

probe is able to access smaller endoscopic lumens, though with somewhat inferior imaging depth (maximum 130µm into tissue) and lateral and axial resolution (maximum 3.5µm and 15µm, respectively)³. Given the limitations of a maximum of 250 µm imaging depth, submucosal layers and invasion of neoplastic cells would not be appreciated without an actual biopsy. One could foresee an expanded role for FNA to synergize with ultrasound imaging and CLE to allow a safer, less invasive accurate staging of tumors.

CLE’s diagnostic utility has been studied primarily in diseases in the gastrointestinal tract lumen including Barrett’s esophagus, gastritis, inflammatory bowel disease, and gastric and colorectal cancer. CLE has also been applied in the hepatobiliary, pancreatic, oropharyngeal, pulmonary, and genitourinary systems, including evaluation of cholangiocarcinoma, pancreatic ductal mucinous tumors, and cervical and bladder neoplasia. In most of these systems, CLE is generally used to screen and survey pre-malignant and malignant lesions based on gross morphology using white light endoscopes or dye enhancement using chromoendoscopy.

White light by itself provides very limited tissue contrast. Multiple topical and intravenous dye enhancement techniques have been used for chromoendoscopy in conjunction with CLE. Intravenous fluorescein (essentially a derivative of eosin) non-specifically stains the extracellular matrix of epithelial cells and the lamina propria and provides indirect information about nuclear size and position because nuclei are not stained. Fluorescein is still a research-only contrast agent, but numerous studies have begun to show its safety and potential⁴. For example, a “Confocal Barrett Classification” based on fluorescein staining shows diagnostic changes involving not just tissue architecture and the presence of “holes” representing goblet cells, but also capillary distribution and leakiness of capillaries⁵. Barrett’s esophagus and associated neoplasia could be predicted with a sensitivity of 98.1% and 92.9% and a specificity of 94.1% and 98.4%⁵.

As fluorescein is not able to directly visualize nuclei, important diagnostic features are not disclosed. In order to achieve nuclear staining, 0.05% topical acriflavine hydrochloride (related to acridine orange) has been used alone and in combination with fluorescein to visualize cell nuclei in multiple CLE studies. Acriflavine was originally used as an antimicrobial agent and has a good safety record in spite of its binding to nucleic acids. Yet, acriflavine has limited and uneven topical penetration, and due to concerns over mutagenicity, it has not been approved for routine clinical work. 0.13% cresyl violet has been used to stain

Timely Topics: Technology con't.

the cytoplasm via fluorescence at 488nm excitation to produce negative contrast staining of the nucleus, similar to fluorescein staining. While CLE can theoretically permit resolution to a subcellular level, in practice, the resolution is still limited by the relatively crude stains available. In fact, the images of CLE most closely correspond to a low magnification, low resolution histologic section. If one studies the CLE images in the literature (e.g., Goetz et al., ⁶), the clarity and beauty of a Papanicolaou stain is readily apparent (Figure 1)!

"Molecular stains" have been researched with CLE for targeted imaging of pathological cells. These exogenous probes have included fluorophore-conjugated non-immunogenic peptides, antibodies and nanoparticles. For example, epidermal growth factor receptor antibodies targeting human colorectal cancer allow visualization of explants of tumors in mice. A recent dramatic molecular visualization with CLE used topically applied, non-immunogenic peptides specific to adenomatous colonic cells in a human study to successfully distinguish adenomatous from normal colonic mucosa ⁷.

As CLE offers the potential to observe microscopic changes in real-time, it has been used to describe cellular physiology and pathophysiology. In vivo CLE has shown, e.g., epithelial cell shedding creating mucosal surface gaps in patients with inflammatory bowel disease. In IBD patients without macroscopic evidence of mucosal inflammation, CLE was able to observe and quantify bacterial translocation into the lamina propria. The potential for dynamic types of changes to have diagnostic utility is enormous, and our expertise in morphology and pathophysiology should allow us to synergize with CLE endoscopists in developing this new field.

Limitations of CLE include the inability to characterize poorly differentiated tumors. For example, a gastric lymphoma and poorly differentiated adenocarcinoma would not be distinguishable. This distinction is based in part on fine cellular-level morphology (e.g. chromatin texture) and specific immunohistochemical features that are not feasibly detectable by confocal endoscopists. More generally, immunohistochemistry and molecular diagnostic techniques for the foreseeable future will require a sample of ex vivo tissue/cells, and cytologists are experts at handling the smallest possible samples for analysis. CLE presents more opportunities for cytologists than threats to our field.

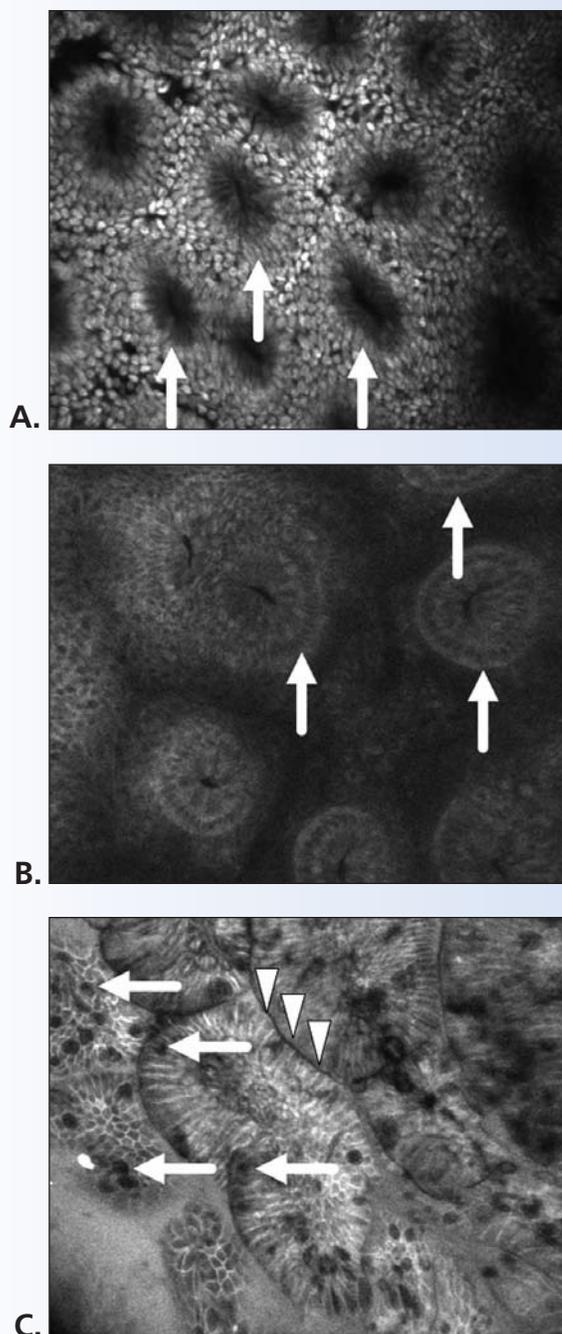
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Figures

Figure 1. Normal colonic mucosa as seen with acriflavine (A) or cresyl violet (B) staining. Barrett's mucosa (without dysplasia) as seen after IV Fluorescein (C) (respectively). (Used with permission from Goetz et al⁶.)



Yolanda Oertel Interventional Cytopathologist of the year Award 2010



Britt-Marie Ljung, M.D.



Yolanda Oertel Interventional Cytopathologist of the year Award 2010

- Medical school Karolinska
- 2 year fellowship cytology, Karolinska
- UCLA Anatomic path training; start of FNAB clinic
- 1997 Director of UCSF Cytology Fellowship
- Co-Director of Cytology division UCSF
- 2001 Cancer Cytology
 - Training in FNAB procurement is key to accuracy of test and to achieve minimal non-diagnostic rates in breast and most likely by extension in all organs/sites.
- 2008-9 served as expert/writer on CAP Ultrasound certificate course for pathologists
- Incorporated ultrasound guidance in the pathologist run FNAB clinic at UCSF
- **Mother of Erik!**



LC Tao Educator of the Year Award 2010



Kim Geisinger, M.D.



Kim Geisinger, M.D. LC Tao Educator of the Year Award

- “ Some of my favorite career moments...”
- Voted as member of Arthur Purdy Stout Society, 1989.
- Publication of first book, Pediatric Cytopathology, 1994.
- Received George Stevenson Distinguished Service Award from ASCP, 2000.
- Served as President of PSC, 2003-05.
- Publication of **Modern Cytopathology**, 2004.
- Recent work on Pathology Committee, IASLC, 2007-
- **Dad of Kristen and Brian!**



A New Treatise on the Cytologic Criteria of Malignancy from the American Society of Cytopathology Cell Biology Liaison Working Group

Rosemary H. Tambouret, M.D., Massachusetts General Hospital, Boston, MA

The Cell Biology Liaison Group of the American Society of Cytopathology is proud to announce the publication of "The Cytologic Criteria of Malignancy" on April 26, 2010 in the *Journal of Cellular Biochemistry* (Fischer AH, Zhao C, Li QK, Gustafson KS, Eltoum IE, Tambouret R., Benstein B, Savaloja LC, Kulesza P. The Cytologic Criteria of Malignancy. *J Cellular Biochem* 110:795-811, 2010). Reprints are available from the authors. The impetus for this essay was the desire to establish a dialogue between the researchers in the cell biology community and cytopathologists. Why create a dialogue? Because there is a perception among cytopathologists that cell biologists are not fully aware of the expertise of the cytopathologist and thus, are unable to exploit that knowledge to develop new avenues of research into the molecular basis of the malignancy. A systematic approach to the problem is taken by which the authors first define the work of the cytopathologist and then describe a tiered classification of the cytological criteria used to morphologically recognize malignant cells. The known molecular alterations found in malignant cells that relate to the criteria are then described, thus linking the two disciplines.

The classification is not histogenetic in nature since the criteria are not tissue specific. Nor in most cases, is this structural classification related to the more function-related "hallmarks of cancer" model outlined by Hanahan and Weinberg (*Cell* 2000; 100:57-70). The cytologic criteria of malignancy provide an alternative way for cancer researchers to relate their work to important biology problems.

The criteria are divided into 3 groups (Table 1). Within each group, the cytologic features used to diagnose malignancy are enumerated and where possible, the molecular bases for the features are indicated. In the first group are changes of altered tissue architecture related to an inability of the cell to undergo anoikis in the face of abnormal cell-extracellular matrix interactions. A variety of architectural changes, such as cell crowding, papillae formation and Pagetoid growth are illustrated for readers.

The second group comprises changes secondary to genetic instability and includes cellular pleomorphism,

the formation of micronuclei, abnormal mitotic figures, chromatin irregularity and variable hyperchromasia.

In the third group, the most heterogeneous, largest and least understood, are all the sub-cellular changes not related to genetic instability. Included in this group are changes related to intermediate filaments (e.g., Figure 1 showing rhabdoid collapse of vimentin in melanoma), nuclear lamina, chromatin, and nucleolar alterations, to name just some. Molecular changes, such as the translocation of RET and TRK in papillary carcinoma, is associated to the nuclear membrane grooves and chromatin clearing of papillary thyroid cancer, though the precise structural basis of any of this vast group remain inadequately defined.

It is hoped that this essay will reveal to cell biologists cytologic criteria of malignancy that have yet to be elucidated on the molecular level and thus, stimulate new avenues of research. The essay, with a tone both factual and philosophical, will also be of value as a teaching tool for both the cell biology and cytopathology communities.

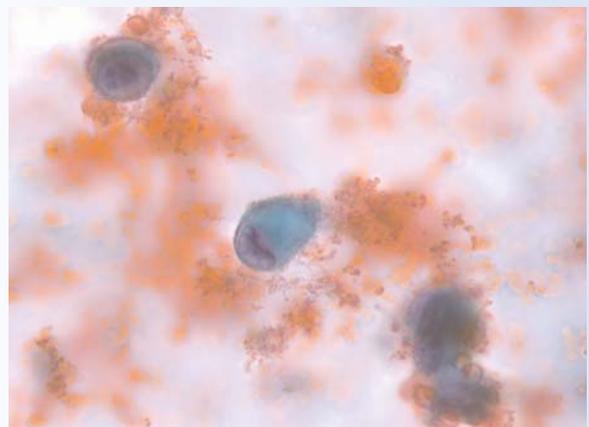


Figure 1: Rhabdoid change in melanoma.

Timely Topics: Cytomorphology

Table 1. Cytologic Criteria of Malignancy

Cytologic Criteria	Probable Cell Biology Basis or Association
Group 1: Criteria at the tissue architectural level	
A. Crowding	Loss of contact inhibition
B. Papillary formation	?
C. Glandular complexity	Aberrant branching morphogenesis
D. Stratification of epithelial cells	Resistance to anoikis, anchorage independence
E. Intraepithelial cell migration (Pagetoid spread)	Cell migration ?Loss of E-cadherin ?Loss of apical-basal polarity
F. Invasion	Extracellular matrix remodeling Apparent resistance to negative growth regulatory signals from extracellular matrix.
G. Loss of intercellular adhesion	Alterations in cell adhesion molecules
Group 2: Criteria related to genetic instability	
A. Abnormal mitotic figures and unpredictable variation in degree of chromasia (distinct from polyploidization)	Chromosomal instability Centrosome and mitotic spindle defects
B. Micronuclei	DNA amplification Acentric chromosomes Mitotic spindle defects
C. Overall cellular pleomorphism	Genetic instability of any type
D. Unpredictable chromatin pattern variation	?Epigenetic instability
Group 3: Subcellular criteria not apparently related to genetic instability	
A. Involving intermediate filaments	
I. Koilocytes	HPV E4 mediated disassembly of intermediate filaments
II. Rhabdoid change	?Null mutations in INI1 of SNF5/INI1 chromatin remodeling complex. ?Mutations in keratin 8 in malignant rhabdoid tumor
III. Dot-like keratin in small cell carcinoma	?
B. Pseudostratification of nuclei	?Nuclear positioning apparatus, related to SUN-KASH proteins and the cytoskeleton
C. Loss of cell polarity	?Disruption of apical-basal polarity
D. Cytoplasmic Auer rods	?
E. Ringed Sideroblasts	?Related to mitochondrial iron metabolism
F. Nuclear lamina changes	
I. Nuclear grooves and inclusions in papillary thyroid carcinoma	Activation of tyrosine kinases RET/PTC and TRK/PTC, and probably activation of B-RAF
II. Nuclear grooves in granulosa cell tumor of ovary	Probably FOXL2 mutation
III. Acquired Pelger-Huet anomaly	? (Lamin B receptor is basis for inherited Pelger-Huet anomaly)
IV. Nuclear molding of small cell carcinoma	?
V. Other forms of nuclear shape irregularity	?Related to GATA6 and loss of emerin in ovarian cancer.
G. Chromatin changes	
I. Euchromatic appearance of papillary thyroid carcinoma	Activation of tyrosine kinases (RET/PTC and TRK/PTC) and probably activation of B-RAF
II. Coarse chromatin texture	Activation of H-RAS, SRC, MOS, A-RAF and MOX-1 in fibroblasts; activation of H-RAS in thyroid follicular cells.
III. Chromatin of small cell carcinoma.	?
H. Nucleolar prominence in absence of reactive cytoplasm; high nuclear cytoplasmic ratio	?

Initiating Fine Needle Aspiration Biopsy Implementation in Kumasi, Ghana

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Solomon E. Quayson, Senior Pathologist, Komfo Anokye Teaching Hospital, Kumasi, Ghana

During a recent visit to Kumasi in Ghana, sponsored by Breast Health Global Initiative, I had the opportunity to meet and work with, among others, Dr Solomon Quayson who is a pathologist at the Komfo Anokye Teaching Hospital (KATH) in Kumasi. New investments have recently been made at KATH resulting in a new building for pathology and upgrading of the oncologic facilities as well. Pathology services until recently have been focused mostly on autopsies required by regulations. A profound shortage of trained pathologists and technicians has also been a big issue. With the new facilities in place, availability of technicians and two additional pathologists all trained in Tromso (the last "o" in Tromso should have a slash through it in order to be proper Norwegian), Norway there are plans to set up a training program in pathology for medical school graduates. Health care in the region has in the past been focused primarily on infectious disease. However, with the life expectancy increasing, cancer has emerged as a major health issue. Resources for cancer care are being put in place and there is a great need for diagnostic services. Fine needle aspiration biopsy (FNAB) is a very cost effective option that can deliver fast results for patients who often come to the clinic from outlying areas. The equipment needed is simple and supplies are not costly. Maintenance of equipment is manageable and a constant reliable power supply is not crucial for using the technique. However training in FNAB sample procurement as well as in interpretation of the specimens is crucial for reliable results. At this initial visit lasting 5 days we were able to set up and successfully complete bench procurement training using bovine liver. This was followed by FNAB sampling of lesions in patients referred from the out-patient clinic. In all 14 patients were seen during the visit including both pediatric and adult cases. A range of diagnoses were made including neoplastic processes such as primary breast and metastatic colon cancer,

sarcomas, Burkitt's lymphoma, neuroblastoma and infectious processes such as abscesses in various stages of development and a case of chromoblastomycosis. In several cases the cytologic findings were not expected based on the clinical presentation. In most of the cases a correct preliminary diagnosis was issued based on immediate evaluation using Toluidine Blue staining. The following day a definitive diagnosis was issued in most cases based on Hematoxylin and Eosin stain combined with a Romanowsky type stain. In a couple of cases a cell block was prepared and immunostaining was done overseas to confirm the classification of the tumor.

A second weeklong visit to KATH is planned for August 2010. The goal for this upcoming visit is to continue to work on improving the quality of the sample procurement as well as interpretive skills and review laboratory practices including staining procedures and cell block preparation. The KATH pathology department has plans to set up immunohistochemical staining protocols for surgical pathology and this dovetails nicely with being able to apply immunohistochemistry to cell block material from selected FNAB specimens. It is anticipated that multiple visits over a period of time will be needed in order to successfully implement a sustained high level FNAB service that can provide definitive diagnosis for treatment of a large number of patients at low cost and in a timely fashion. It is hoped that this model of repeat visits with one on one training can serve as a complement to CME-type courses now made available in Africa thanks in part to the generosity of several members of the Papanicolaou Society. Another way to enhance the training/education process could be to set up a system for tele-pathology for ongoing consultation on challenging cases. Stay tuned for updates in the future!



Figure 1



Figure 2



Figure 3

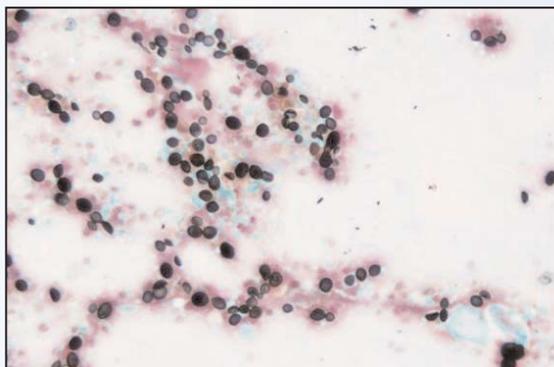


Figure 4

Legends to figures

1. Newly constructed building for the department of pathology at Komfo Anokye Teaching Hospital
2. Dr Ljung discussing and demonstrating approach to sampling before FNA procedure of palpable breast mass.
3. Orbital mass in woman causing proptosis. Clinical diagnosis was suspected Meningioma.
4. Silver stain from cytologic material obtained from patient in figure 3 showing Chromoblastomycosis.

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