

Global Perspectives: The Quest for Knowledge in Cytopathology

A unique opportunity has emerged with resources that are currently available internationally. The internet has encouraged cytology laboratories around the world to become active and provides access to the American Society of Cytopathology.

Differences in the practice of cytopathology worldwide may facilitate change in laboratories throughout the country. Invited speakers from across the globe will have an opportunity to answer a list of questions provided by the Editorial Board of *The ASC Bulletin*.

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The Department of Pathology at the Aga Khan University Hospital, Nairobi caters to the needs of patients from Eastern Africa, including Southern Sudan.

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The Department of Pathology at the Aga Khan University Hospital, Nairobi (AKUH, N) caters to the needs of patients from Eastern Africa, including Southern Sudan. It is a large comprehensive pathology practice with community based approach providing service to a number of private hospitals and clinics in addition to our own tertiary care teaching hospital. The laboratory provides leadership and support to other Aga Khan Hospital laboratories in Kisumu and Mombasa in Kenya, and Dar-es-Salaam in Tanzania, as well as sixteen Outreach Centres in Kenya. A Regional Laboratory Director (Dr Moloo) helps to coordinate activities between the four hospitals and the Outreach Centres. Being one of the busiest laboratories in Sub-Saharan Africa, we perform about a million tests per year, including 19,000 surgical pathology specimens and 10,000 cytology specimens.

The Cytopathology unit is part of Anatomic Pathology section. There are four full-time anatomic pathologists and eight residents in anatomic pathology. We have a full time cytopathologist who supervises the Cytopathology unit, which includes signing out of all cytology cases, teaching of cytopathology to the residents, training of residents in Fine Needle Aspiration (FNA) procedure, teaching the technicians cytopreparatory techniques, as well as other cytology related activities. In her absence, the other pathologists share the workload with signing out of the cases. All interesting, difficult and positive cases are discussed at the daily Departmental Case Consensus meeting attended by all pathologists and residents.

The technologists need to have a diploma or higher national diploma when they are employed in our laboratory. The histotechnologists have been cross trained to do cytopreparation and staining. They also assist when FNAs are performed. We do not have cytotechnologists in our laboratory. There are very few trained cytotechnologists in the country. A three year training program in Masters of Science in Cytology is available at the University of Nairobi. The students after completion of training are expected to be employed as cytologists/cytoscreeners in public and private sector. However this cadre is not yet recognized by the health

continued from page 132

department of the government and negotiations are going on between education and health department. A large number of these students are government sponsored candidates and will go back to their jobs.

The total workload for the year 2009 for the Cytopathology laboratory was 6,500 Pap smears, 4,000 non-gynecological specimens, which included 2500 Fine Needle Aspirations (FNA).

Our pathologists and residents run a regular FNA clinic and perform FNA procedures on all inpatients as well as outpatients referred from our outdoor clinics and other private hospitals, clinics and laboratories. The referral from outside constitutes about 40% of our FNA workload. The cytopathologist and the residents also conduct weekly FNA clinic at the Outreach Centres around Nairobi with an average case load of 15-20 cases per clinic/per week. We also receive slides of FNA performed by the clinicians, radiologists, surgeons, primary care physicians and clinical officers.

The most common sites sampled for FNA are breast, thyroid and lymph nodes. Other less frequent but not uncommon sites include soft tissue, salivary glands and abdominal masses. Interestingly, lung FNA is not frequently performed as most lesions are infectious in origin, with tuberculosis being the most prevalent. Moreover smoking is less prevalent in Kenya as compared to developed countries. Other non-gynaecological specimens include sputum, ascitic fluid, pleural fluid, CSF, urine, bronchial washings and brushings, and endoscopic brushings from esophagus and stomach.

There is a One Stop Breast Clinic in our hospital, which provides the triple test approach. Our cytopathologist and residents perform FNAs on palpable breast masses referred after clinical breast examination or radiological examination, with the final result dispatched within two hours. We do Rapid On-Site Evaluation (ROSE) on Diff-Quik stained material and give provisional diagnosis for all ultrasound guided FNAs from thyroid, breast and deep seated lymph nodes. For all other guided FNAs including endoscopic guided FNA, an onsite evaluation for sample adequacy is done by the cytopathologist and residents. Technicians help in the rapid staining but do not perform adequacy evaluation.

The final results are reported on a Laboratory Information System. Unfortunately, the currently used software has limitations and therefore we do not have access to the patient's previous history. This makes it difficult to do correlation between cytopathology and histopathology, compare the ratio of normal to abnormal Pap smears, or research related activities. All data are collected manually in order to do any of the above correlations; however, our IT professionals are working on it to make it more user-friendly.

Only conventional Pap smears are examined at our laboratory. We do not provide HPV testing in our laboratory, which is sent out to a referral laboratory outside Kenya. We have a two tiered screening system. All the Pap smears are screened by the residents and then reviewed and signed by the faculty. On an average day, about 25-30 Pap smears are screened.

Kenya does not have any organized cervical screening program. Only the opportunistic screening is offered to women who attend health care facilities at public and private centres. This is available only in cities and some better developed provinces. The women in rural areas and underdeveloped provinces remain largely unscreened. In addition, some non-governmental organizations fund some Pap smear screening in a fragmented manner that is not sustainable. Aga Khan University Hospital, being a private non-profit organization, offers high quality Pap smear screening service at a cost of 10 USD to all women who attend our facility and to those referred by private physicians and gynecologists or on self referral. Thus women with ability to pay get screened. During September and October, a special cancer awareness program is conducted by our hospital, and screening for cervix and breast cancer is offered on subsidized rates. At this time, the number of women getting screened is much higher than in other months.

Unfortunately there are no national statistics available, but rough estimates of about 20,000 women are screened annually in Kenya, out of 15 million women in the reproductive age group.

Ancillary Techniques

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continued from page 133

stains, which are done on cell blocks. All the cell blocks are prepared by one technologist assigned to the cytology laboratory.

Facility for flow cytometry has recently been introduced in our hematology laboratory and soon it will be available for FNA cases where lymphoma is suspected.

Histochemical stains are routinely employed as and when indicated. The most commonly used stain is Ziehl Nielsen for acid fast bacilli as we have a heavy load of tuberculosis. Other stains such as Mucicarmine, PAS, and silver stain for organisms are also performed in the laboratory.

We provide a comprehensive approach to the diagnosis of extra pulmonary tuberculosis which includes FNA, culture and PCR on FNA material for mycobacterium tuberculosis. This is a unique facility provided at our laboratory in a setting with high burden of tuberculosis and resistance to commonly used drugs.

Teaching and Training in Cytology

The department is equipped with a multihead microscope and facilities for video projection. Interactive tutorials are regularly conducted by our pathologists to train and mentor our residents in cytopathology. Regular cytology workshops are also held at our centre with assistance by international visiting faculty. We have a library which is well equipped with text books, electronic teaching aids, internet and access to large number of journals through HINARI program of World Health Organization.

QA/QC Responsibilities within the Laboratory

We have Standard Operating Procedures in place for all the tests performed in the laboratory.

After a cytopathologist (Dr. Kumar) joined our section six months ago as full time faculty, we are currently evaluating our internal QA/QC in cytology laboratory. We hope to begin 10% random rescreening of normal Pap smears. All abnormal Pap smears are reviewed daily at Departmental Case Consensus meeting. Currently, we do not have a formal EQA in place for non GYN cases; however, we do cytopathology and histology correlation whenever it is possible.

The laboratory's abnormal rate for the Pap smears is 4-5%, with the ASCUS:LSIL ratio of 2:1. All attempts are made to retrieve the previous slides for review and comment in the final report. It is possible only in a portion of cases in which previous slides are retrievable. The slides are reviewed up to 2-3 years back, but sometimes it is not possible to retrieve the slide due to improper archiving beyond this period. Sometimes the information about previous abnormal smears is not complete in the request form and lab information system is not able to provide the accession numbers of previous smears. In other cases it may have been done in other labs or even outside the country.

We are currently working towards getting accreditation of our laboratory through South African National Accreditation body (SANAS).

The strategy of having a regional laboratory approach has resulted in standard request forms, standardized reporting formats for the Pap smears using the Bethesda 2001 system, and using the common report templates for FNA for all the four hospitals. The Bethesda 2008 system of reporting thyroid FNA is already in place. This also has the benefit of creating more consistency of diagnostic criteria, reporting vocabulary and synoptic report formats.

Unique Features of our Lab

- Regional Laboratory initiative: As a result of the efforts of our Regional Laboratory Director (Dr. Moloo), our laboratory is recognized as regional hub for referral of cases from Eastern Africa. Interesting and/or difficult cytology cases are referred to AKUH, N for a second opinion as well as for immunohistochemistry from the other affiliate hospitals. This is offered to the patients at no extra cost as the material is also used for teaching the residents.

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continued on page 135

continued from page 134

- State of the art service: Our practice has a large component of Breast and thyroid FNA including ultrasound and CT guided FNA and is recognized for excellent results. Our team works hard to produce a correct report in a reasonably short time. We routinely do rapid on site evaluation (ROSE) for all guided FNAs at no extra cost. In addition, intraoperative cytology is an important component of our cytology service. While we are preparing to set up a frozen section facility, we use touch and scrape cytology to provide an opinion within 35 minutes on sentinel lymph nodes, lumpectomy or mastectomy margins and ovarian masses etc. The laboratory is equipped with facilities to provide immunochemistry and flow cytometry.
- Centre for training in cytology: With a full time cytopathologist on board, our laboratory is increasingly being recognized as a centre for cytology training, technical support and guidance and we receive requests from trainee pathologists and practicing pathologists within the country as well as other neighboring countries who wish to spend some time in the laboratory to improve their skills.

As we struggle to meet the above challenges, we aspire to provide state of the art cytology services at an affordable cost in keeping with the Aga Khan University's overall vision in Africa to provide quality healthcare and education in the region.

What Challenges does your Cytopathology Laboratory Face?

Shortage of manpower such as trained cytotechnologist, cytoscreener, laboratory space for archiving, and storage of reagents and equipment is a major challenge. We do not have a properly equipped FNA Clinic. This will be provided in our upcoming Heart and Cancer Centre. Our filing system of hard copies of reports and request forms, previous cytology or histology data of patients needs to be better organized.

Cases referred to us for a cytology opinion often (both Pap smears and Non-gynaecological cases) are of poor quality, both in terms of preparation and fixation. Fluids are often stored poorly, so that the cells are degenerated. We regularly hold continuing medical education sessions to sensitize our sample providers on proper preservation and transport of cytology samples. We also train them in performing FNA procedure and prepare good smears as the main limiting step is availability of skilled operators. This includes surgeons, clinicians, clinical officers and general practitioners.

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Front row, from left: Shahin Sayed, MBCh, MMED and Neeta Kumar, MBBS, M.D.; **Back row, 2nd from left:** Zahir Moloo, M.D.