REX

Laboratory Bulletin

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Updates and Information from Rex Pathology Associates

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Specimen Adequacy in Non-Gynecologic Cytology

The volume of non-gynecologic cytology specimens continues to grow at Rex Healthcare Laboratory. Cytology often permits a conclusive diagnosis from a minimally invasive procedure and at relatively low cost. The goal is to provide a specific pathologic diagnosis, when possible. *By definition, a specimen that is "**diagnostic**" of a specific disease process is "adequate". However, not all "adequate" specimens are "diagnostic".* If a specific diagnosis is not possible, it is important to assure that a sufficient number of cells have been removed for evaluation. The Bethesda System of reporting *cervicovaginal* specimens provides widely accepted criteria for assessing Pap smear specimen adequacy. No such system exists for *non-gynecologic* specimens, although several have been proposed. This is due, in part, to the fact that non-gynecologic cytology specimens are even more sensitive to "sampling error" than surgical/medical biopsies or Pap smears. A subset of cytology specimens will be judged "insufficient for diagnosis" or "hypocellular, nondiagnostic specimen". The definition of "adequacy" depends on the organ/tissue being evaluated and the type of specimen. The discussion below includes some recommendations by the Cytopathology Committee of the College of American Pathologists. [1]

David S. Shepard, Lab Assistant

Breast cyst aspirate [1]

- Watery, green fluid; no residual mass, may discard specimen without cytologic exam at the discretion of the physician.
- Bloody fluid should be sent for cytology.
- Metaplastic apocrine cells, macrophages, amorphous debris +/- epithelial cells constitute normal findings
- If residual mass present, perform FNA on "mass" for cytology.

Breast mass fine needle aspirate (FNA)

- No national standard. An acellular specimen or one composed exclusively of blood cells is clearly unsatisfactory. Some aspirates are composed of connective (predominantly adipose) tissue only. Generally like to see at least moderate numbers of epithelial cell clusters. Scant cellularity, obscuring blood or inflammation, or air-drying artifact may produce suboptimal specimens. The aspirator is in the best position to determine if the abnormality has been adequately sampled. The cytologic findings should be evaluated in the context of the clinical and radiographic impression (the "triple test" strategy).

Fluid (CSF, pericardial, peritoneal, pleural)

- CSF: Normally very sparsely cellular (rare WBCs). Grossly bloody or clotted specimen may be unsatisfactory
- Pericardial, peritoneal, pleural: Normally expect to see mesothelial cells and macrophages. Excessive blood or inflammation may produce an unsatisfactory specimen.

FNA of "deep" organs (e.g. adrenal gland, kidney, liver)

- No national standard. An acellular specimen or one composed exclusively of blood cells is clearly unsatisfactory. Generally like to see at least moderate numbers of epithelial cells recognizable as native to the target organ. Scant cellularity, obscuring blood or inflammation, or air-drying artifact may produce suboptimal specimens. Marked inflammation suggests an inflammatory process and microbiologic culture should be considered.

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- Cell blocks containing lesional cells are invaluable for accurate classification of certain neoplasms. They can also be helpful for characterizing infectious diseases. In such cases it is recommended that one to two additional "passes" be performed to provide material exclusively for cell block preparation.
- FNA is not appropriate for evaluation of medical kidney or liver disease (e.g. glomerulonephritis or hepatitis). A core biopsy is essential for these conditions.

Gastrointestinal tract brushing/washing [1]

- Six – 10 well preserved epithelial cell groups (at least six cells/group).
- Hypocellularity, obscuring blood/inflammation/necrosis may result in an unsatisfactory or suboptimal specimen.

Lung (sputum, bronchial brushing/washing, bronchoalveolar lavage) [1]

- Sputum: readily identifiable alveolar (carbon pigment-laden) macrophages required to verify pulmonary source.
- Bronchial brush/wash: numerous recognizable ciliated bronchial epithelial cells and alveolar macrophages.
- Bronchoalveolar lavage (BAL): Numerous (93 +/- 5%) alveolar macrophages and a few lymphocytes define a normal BAL. Increased numbers of inflammatory cells suggest either a pathologic process or contamination by blood/bronchial secretion.
- Paucity of alveolar macrophages (< 10/hpf or < 25/hpf with blood/ exudates) or > 5% ciliated bronchial cells/squamous cells indicate an unsatisfactory specimen.

Lung FNA [1]

- Readily identifiable ciliated respiratory epithelial cells, alveolar lining cells, alveolar macrophages +/- mesothelial cells.
- Excessive blood, bronchial secretion or hypocellarity may result in a suboptimal or unsatisfactory specimen.

Lymph node FNA

- Flow cytometry is extremely helpful (some would say "critical") in evaluating lymph node FNA specimens, but this technology is not currently available at Rex (or most other community hospitals). Unfortunately it is difficult to get satisfactory results with lymph node aspirate material sent to other laboratories due to poor viability/antigen preservation. The comments that follow reflect the author's opinion about lymph node FNAs at Rex, given the lack of flow cytometry.
- Can be quite helpful in evaluation of metastatic malignancy (e.g. carcinoma, melanoma) or primary diagnosis of large cell or high grade lymphoma.
- Can be helpful in confirming secondary involvement in a patient with a known lymphoma, particularly if a cell block or core biopsy is available for immunoperoxidase lymphocyte phenotyping.
- May be helpful in suggesting a primary diagnosis of a small B-cell lymphoma or Hodgkin's lymphoma, but excisional biopsy will be required for confirmation and to assure appropriate classification. Again, cell block or core biopsy will increase the likelihood of a confident diagnosis.
- Reactive lymphadenopathy has characteristic FNA findings, but there is overlap with some mixed cell lymphomas. Clinical correlation and follow-up are essential.
- Air dried and fixed smears have complimentary cytologic features and both preparations are recommended. As noted above, cell blocks or a needle tissue core may be helpful in selected cases.
- Hypocellular or thick/bloody smears may result in a suboptimal or unsatisfactory specimen.

Salivary gland FNA

- Moderate numbers of acinar/ductal epithelial cells.
- Air dried and fixed smears have complimentary cytologic features and both preparations are recommended.
- Hypocellular or thick/bloody smears may result in a suboptimal or unsatisfactory specimen.

Soft tissue FNA

- Soft tissue neoplasms represent a particular challenge to the cytopathologist. Soft tissue tumors often yield cells grudgingly, possess regional variation in appearance and have distinctive architectural patterns that may not be apparent in cytologic specimens. Indeed, some pathologists have stated that there is no role for FNA in evaluating soft tissue tumors. A core biopsy can assist in overcoming some of the pitfalls described above.
- As some sarcomas (e.g. liposarcoma) can have bland cytology, while reactive soft tissue lesions (e.g. proliferative myositis) can possess alarming cytologic atypia, correlation with the clinical and radiographic findings is critical. Pre-procedure consultation with the attending pathologist is recommended to assure an appropriate specimen is obtained and to increase the likelihood of an accurate diagnosis.

Thyroid gland FNA [1]

- Six – eight groups of well preserved follicular cells (at least 10 cells/group) OR
- Six groups of follicular cells on at least two slides from separate passes OR

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Judy Harris, MT, CT (ASCP)

- 10 clusters of follicular cells (20 cells/cluster)
- Cystic lesions should have abundant watery colloid and macrophages. If follicular cells are not observed, can be interpreted as "c/w colloid nodule" but with a comment that a cystic neoplasm cannot be excluded due to paucity of follicular cells. Cystic papillary carcinoma recurs rapidly after aspiration, so careful follow-up is essential in this scenario. If there is a residual mass palpable following cyst aspirate, then the mass should be re-aspirated and submitted as a separate specimen.
- If no or few follicular cells are observed and colloid is scant or absent, the specimen is unsatisfactory.

Urine [1]

- Few urothelial (transitional) cells with a clean background and absent inflammatory cells constitute a satisfactory specimen. In a symptomatic patient, expect to see more urothelial cells.
- Squamous cells may be present, particularly in women.
- Large amount of blood, amorphous debris, inflammatory cells or crystals may result in unsatisfactory specimen.

A clinically suspicious or radiographically suspicious lesion with benign cytologic findings should always be subjected to further evaluation (or at least careful follow-up) to avoid the possibility of "sampling error".

John D. Benson, MD

Reference
1. Moody DR. Defining adequacy in nongynecologic cytology. *CAP Today* August 2003, pp. 68, 70.

Red Cell Mass Measurement Discontinued

Effective January 15, Rex Laboratory no longer performs red cell mass determinations. This decision was prompted by the vendor's decision to cease manufacture of the necessary reagents. The red cell mass study is labor intensive and relatively expensive to perform. The results are often difficult to interpret, as there may be overlap between polycythemia vera and secondary erythrocytosis. The clinical relevance of the red cell mass has further decreased over the years due to the development of the serum erythropoietin assay. A decreased erythropoietin level in the setting of erythrocytosis is highly suggestive of polycythemia vera. Most experts believe the National Polycythemia Study Group criteria, which require a red cell mass study, are no longer valid. The July 2003 issue of the *Rex Laboratory Bulletin*, reviews the topic of polycythemia vera in detail. An electronic copy or reprints are available upon request.

On the horizon is a research assay that may be helpful in establishing the diagnosis of myeloproliferative disorders including polycythemia vera. The *endogenous erythroid colony assay* is not currently available for clinical use but holds promise for the future. This test has value when interpreted in conjunction with a serum erythropoietin level.

Stephen V. Chiavetta, MD

Reference:
Chiavetta SV. Polycythemia vera, *Rex Laboratory Bulletin*, Issue 82, July 2003, p. 1 – 4.

Group B Streptococcus Bacteria During Pregnancy

In August of 2002 the Center for Disease Control provided an update for treatment, prevention and laboratory procedures concerning Group B Streptococcus (GBS) in pregnant women. The main change for the laboratory has been the need to perform susceptibility testing for patients at risk for anaphylaxis to penicillin. Currently when this allergy is noted on a GBS screen from the rectovaginal swabs, testing is performed with erythromycin and clindamycin.

Also present in the CDC document is a brief discussion concerning GBS in urine cultures. The CDC states, "The presence of GBS bacteriuria in any concentration in a pregnant woman is a marker for heavy genital tract colonization. Therefore, women with any quantity of GBS bacteriuria during pregnancy should receive intrapartum chemoprophylaxis." To meet this standard the laboratory has modified its urine culture procedure. Normally organisms are identified based on a colony count (typically more than 10^4). We have adapted our procedure for urine cultures in females from 12 to 50 years of age, so that microbiology technologists will visually scan for any organism that may be GBS and proceed to appropriate identification. If a clinician has a pregnant patient outside of this age range, a comment that the patient is pregnant, will also lead to this extra screening. All positive cultures are retained in the lab for four additional days, so a re-examination can be requested when a pregnant female outside of this age range had a urine culture without pregnancy status provided to the lab. If this occurs, call Rex Microbiology at 784-3051.

Vincent C. Smith M.D.

Reference:
Prevention of Perinatal Group B Streptococcal Disease, Revised Guidelines from CDC. MMWR. CDC. 7/16/2002.

H.*pylori* Lab Test for Mummies

In an earlier lab bulletin, I had lamented that few people seemed interested in the stool antigen test for H. pylori. "A low cost, relatively convenient test (that for some reason has just not "caught on"). We may discontinue the test in the future if business does not pick up." [1] Thanks to alert reader Stephen J. Rashbaum, MD for pointing out that this test is performing quite well in helping paleopathologists diagnose H. pylori infections in Egyptian and South American mummies. [2] Maybe we're marketing to the wrong audience.

John D. Benson, MD

References

1. Benson JD. Gut Check #3 – Diagnostic Testing for H. pylori. Rex Healthcare Laboratory Bulletin. Issue 80, May 2003.
2. Ulcers found in Egyptian mummies. http://www.mummytombs.com/mummylocator/strange/medical.disease.ulcers.htm

New Bulletin Format/New Accessibility

We are pleased to present the *Rex Lab Bulletin* in a new format. This format will improve our ability to present photographs and drawings. In addition, back issues of the bulletin are now available on the Rex Intranet (RexWebMD Physician Access) under the Laboratory Services header. The articles are listed in alphabetical order based on a key word in the title. This will lead you to the complete issue in which the article appeared. You will have to scroll down to find the article if it is not the lead article. Alternatively one can select the "Search R:/ Drive" option on the Rexweb intranet. Type in the subject (e.g. "PTH assay") and start the search. As a final option, the bulletins are listed chronologically on the shared R:\ drive of the Rex Healthcare Hospital Information System (r:\document\final\Lab\Publicat\Bulletin). Thanks to Mitzi Sherwood (IT Graphics), Jenny Johnson (Marketing Services), Rhonda Humphrey (Rex Pathology Associates Practice Manager) and Barbara Koelsch (Lab Administration) for their roles in the publication and archiving of the bulletin. We hope you enjoy the new format and improved accessibility. Comments or suggestions are welcome (919) 784-3059 or John.Benson@rexhealth.com.

2003 Antibiogram

We are pleased to include the 2003 Antibiogram as an insert in the current issue of the Bulletin. Thanks to Susan Tricas MT(ASCP), Sheila McMahon MT(ASCP) and the Rex Microbiology Laboratory staff for collecting the data and preparing the antibiogram.

HIV *p24* Antigen Test Discontinued

Abbott Laboratories has discontinued production of the HIV p24 antigen assay kit formerly used to assist in the identification of acute HIV infection. As a result, Mayo Medical Laboratories (and therefore Rex Laboratory) are no longer offering this test. The reasons for this stem from low clinical demand for the test due to the development of better serologic assays and a change in standards for blood donor screening. A substitute test is available from Mayo Medical Laboratories, HIV-1 RNA by Roche Amplicor, Ultrasensitive, Quantitative (Mayo test code #81624). This test has not been FDA approved, but may be helpful in detecting and quantifying low copy numbers of HIV-1 (50-100,000 copies/mL) in plasma, as in the setting of acute HIV infection. The test requires 2.0 mL of EDTA plasma, frozen. The cost for Rex Outreach clients is roughly $180.

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