

The Power of Cytology in Veterinary Dermatology

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Cytology is a powerful diagnostic tool that really lends itself to veterinary dermatology. It is quick, inexpensive and provides useful information, even to the less experienced. While cytology does not always provide a definitive diagnosis, it frequently is suggestive enough to push one to do specific diagnostic procedures and think about specific diseases. It is certainly worth the effort.

It is recommended that practices have at least 2 microscopes; one for skin scrapings and fecal examinations and one for cytology and hematology. This is the best way of protecting your high power objectives. As a general rule, samples should be scanned on low power and then examined using a 50x or 100 x oil immersion.

The stains I most often use are DiffQuick (modified Wrights stain), New Methylene Blue, or Gram stain. The tendency is to under stain. This may be fine for a clinical pathologist, but I find it helpful to somewhat over stain - it tends to make infectious agents more visible. Personally, I rarely blot slides. I like to let them air dry. If your sample is somewhat thick and you blot it, you may lose part of your sample.

As a dermatologist, I find it difficult to see a pustule and not do cytology. Pustular cytology may be extremely rewarding. Depending on the size and nature of the pustule, samples may be collected using various methods. With larger pustules, it may be possible to aspirate the contents using a fine gauge needle. Material may be squirted onto a microscope slide, and then smeared, in the same manner that would be utilized for a blood smear. Pustules may also be ruptured, using a fine gauge needle and then one may use a microscope slide and collect an impression smear. A Tzank prep is produced by removing the top of the pustule and using it to make an impression smear.

Common cytology findings from pustules include bacteria and white blood cells. Even without a gram stain, one may recognize *Staphylococcus sp* and *Pseudomonas*. There are also several cells which may be easily recognized. These may provide a

tentative diagnosis or support a further diagnostic workup. Easily recognized cells include: neutrophils, eosinophils, lymphocytes, macrophages, and acantholytic cells.

Crusts are also useful for cytology. After removing the crust, it may be pressed onto the microscope slide to make an impression smear, or the slide may be pressed to the skin in the area where the crust was removed. Findings from crusts include: acantholytic cells, bacteria, fungi, yeast, and various white blood cells.

The skin surface itself may reveal valuable information via cytology. Again, a microscope slide may be gently pressed against the skin. Likewise, clear tape may be pressed to the skin and then placed on a microscope slide for examination. In the latter case, a drop of new methylene blue may be placed on the slide prior to the tape, to allow better visualization of cellular material. Bacteria and yeast are common findings.

Draining tracts almost always have enough material to provide informative cytology. Samples may be collected by impression smear or an aspirate and squish preparation. Potential findings include bacteria, fungi, tissue "grains" (generally a collection of microorganisms coated with immunoglobulin), white blood cells, macrophages and neoplastic cells.

Finally, any time one encounters nodular skin disease, cytology should be included in the diagnostic plan. Aspirates are generally performed using a 22 or 25 gauge 1 inch needle and a 5 - 10 cc syringe. After aspirating the nodule, the vacuum should be released prior to withdrawing from the tissue. It works best to remove the needle, fill the syringe with air, replace the needle and discharge the material onto a slide. Nodular cytology may also be collected by performing an impression smear from the cut surface of a biopsy. Things which might be visualized included a variety of organisms, white blood cells, macrophages, fibroblasts and neoplastic cells.

With practice, one can learn to tentatively diagnose most of the round cell tumors based on cytology, or at least to develop a differential diagnosis based on cytology that would suggest the need for submitting a biopsy for histopathology. Round cell "discrete" tumors include: lymphoma, mast cell tumor, histiocytoma, plasma cell tumor, transmissible venereal tumor and melanoma.

Other types of cells which may be identified are epithelial cells. These are

generally oval to polygonal and tend to form sheets or clumps. Likewise, mesenchymal cells (from connective tissue, skeletal tissue, and vessels), tend to be spindle to oval in shape.

Finally, there are some findings that suggest malignancy, even if one can't identify the cell type. These findings should push one to collect a biopsy for definitive diagnosis.

Findings suggestive of malignancy (from D. J. Meyer)

1. Variable cell size (anisocytosis)
2. Variable cell forms (pleomorphism)
3. Variable cytoplasmic staining intensity
4. Variable nuclear sizes (anisokaryosis)
5. Variable nucleolar sizes and shapes
6. Variable nuclear to cytoplasm ratio

Cytology is a wonderful diagnostic tool in veterinary dermatology. It is generally non-invasive, quick, easy and many times informative. With practice, one can gain confidence and expand the number of cells they recognize. The more you use cytology, the more you will rely on it.