

"Call before you dig" . . . Common biopsies that may be almost worthless!

When trying to convince an owner to opt for surgical biopsy, the most powerful argument is that biopsy often offers the greatest chance of making a diagnosis relevant to therapy and/or prognosis. It probably rates as one of life's more embarrassing moments, therefore, when the report comes back with very inconclusive findings... and a comment from me that a biopsy of that type almost never results in a significant contribution to the diagnosis, treatment, or prognosis! I thought it might be useful to review some of the conditions for which biopsy interpretation has a greater-than-usual likelihood of being inconclusive. As you will see, the reasons vary a great deal, but nonetheless most pathologists would agree with most of my selections for "the 10 most worthless biopsies in surgical pathology"! To be fair, there are indeed perfectly valid reasons for doing most of these biopsies in selected cases, but you do need to have very specific reasons to make the expense of biopsy justifiable in most of the examples listed below.

1. ***Any chronic, heavily treated inflammatory skin disease.*** The scenario is a familiar one: a dog or cat is rushed to you for a second opinion, with a complaint of three years of inflammatory skin disease that has been treated with everything in the pharmacy! You calmly look the owner in the eye, and sagely advise skin biopsy! We pathologists call this "guilt transference surgery".... in which you skillfully transfer the problem from your shoulders to mine! This is truly a catch-22 situation, because the more chronic the skin disease, the less specific are the histologic markers. On one hand, you do not wish to rush every skin case to biopsy before you have had a chance to try standard therapy for your leading clinical diagnosis; on the other hand, you do not want to delay so long that you run the risk of getting back the dreaded diagnosis of "end stage skin". If you feel you have no choice but to biopsy such chronic skin cases, at least protect yourself from abuse by making only modest promises of the utility of such biopsy, *and by selectively sampling the most active-looking lesions that you can find*. As an added reminder, if you find it necessary to biopsy a dog that is still under the influence of corticosteroids (oral steroids within the last ten days, long acting injectables within the last six weeks), remember to tell me about the steroid therapy so I can attempt to compensate for that in my interpretation.
2. ***Chronic mucoid or suppurative rhinitis in dogs or cats.*** While not a fatal disease, this is certainly an annoying and perplexing problem for both owners and veterinarians. Cytology almost invariably leads to a diagnosis of "suppurative nonseptic rhinitis", which is a completely nonspecific reaction of the nose to any type of irritation and is definitely not a justification for assuming a bacterial pathogenesis. Surgical biopsy becomes the diagnostic procedure of last resort when therapy has failed to resolve the problem, but again your expectations may be too lofty. The usual histologic change is very mild and nonspecific, with a mixture of lymphocytes, plasma cells, and neutrophils within an edematous lamina propria below a normal respiratory epithelium. The lesions carry no etiologic weight whatsoever, and nobody really believes that the presence of neutrophils predicts a bacterial pathogenesis. The biopsy may be useful in ruling out alternative diagnoses such as mycotic rhinitis, nasal carcinoma, or eosinophilic (allergic?) rhinitis, but it will not offer a specific

etiologic or even therapeutic insight. Biopsy is certainly not worthless, but you need to have very realistic expectations!

3. **Mammary cytology:** The criteria by which we distinguish mammary hyperplasia from neoplasia, and even benign neoplasia from malignancy, are based on architectural features like the degree of tubular and papillary sophistication, and especially the presence or absence of peripheral invasion. These features cannot be evaluated via cytology. Since many mammary tumors have a great deal of inflammation within them, using cytology even for the most fundamental task of distinguishing whether a nodule is inflammatory or neoplastic is very unreliable. In my opinion, performing mammary cytology is a waste of your clients' money except for those very few instances in which you have a reasonable suspicion of a non-mammary tumor like mast cell tumor.
4. **Chronic gingivitis/stomatitis:** The temptation to biopsy cases of chronic, refractory gingivitis/stomatitis in dogs and, especially, in cats appears to be overwhelming. The problem is that this tissue seems to respond with a remarkably stereotypic reaction involving epithelial hyperplasia and a subepithelial linear infiltration of plasma cells, regardless of the nature of the stimulus. Whether the disease is viral, allergic, or mechanical seems to make virtually no difference, so all of these biopsies look exactly the same and provide no insight into etiology or pathogenesis. Except in those cases in which neoplasms like squamous cell carcinoma or epitheliotropic lymphoma are reasonable options, or in which the macroscopic appearance suggests eosinophilic granuloma, such biopsies are most unlikely to provide useful prognostic or therapeutic information.
5. **Splenic fine needle aspiration** is regarded by most cytologists as a very "low return" procedure except when dealing with diffuse splenomegaly in which one of the round cell tumors like lymphoma, malignant histiocytosis, or splenic mastocytosis is a reasonable candidate. With any other condition, splenic aspirates are likely to yield a predominance of fresh blood with an uninterpretable background of hematopoiesis, lymphocytes, stromal cells, and other normal splenic residents.
6. **Liver fine needle aspiration** is reliable only for the diagnosis of hepatic lipidosis in cats, and moderately reliable for the diagnosis of malignant lymphoma (or the rare example of other systemic round cell malignancy) in both dogs and cats. *It is not reliable for any other disease diagnosis*, simply because the diagnosis of all of the other liver diseases requires an appreciation of liver architecture.
7. **Trucut biopsies of kidney** are an excellent example of how technology threatens to dictate medical practice. Just because we *can* does not mean that we *should*! Trucut kidney biopsies provide an excellent view of that particular portion of kidney, but do not allow us to judge whether we are looking at the best of the kidney or the worst of the kidney. Most of the kidney diseases have a lot of regional variation in the severity of the disease, and trucut biopsies give you no sense of the health of the overall kidney. In most instances, the prognosis and response to treatment are more reliably established based on careful

assessment of biochemical data including urinary specific gravity and urinalysis. There are very few specific instances in which trucut biopsies are indicated. The most common is to establish the prognosis for diffuse acute tubular injuries in dogs or cats being maintained at great expense in intensive care units.

8. **Bone core biopsies** for the diagnosis of suspected osteosarcoma or (rarely) other bone neoplasms are usually definitive if done by people experienced with this biopsy technique... and almost universally worthless when done in any other context. The histologic diagnosis is easy; the trick is in getting samples that reach deeply enough into the bone to capture the tumor. Less than 20% of the biopsies in pursuit of the diagnosis of osteosarcoma that I get from primary care practices are technically adequate. Part of the problem is improper instrumentation, and part of the problem is inadequate experience.
9. **Transtracheal washes** are vastly inferior to bronchoalveolar lavage samples, and even the latter are notoriously insensitive for detecting and characterizing pulmonary disease. The problem with transtracheal washes is that the tissue being sampled is usually just the lumen of large airways, which is usually not where the disease exists! In addition, the wash fluid is toxic for the cells within the harvest, and cell preservation is often exceedingly poor. Occasionally one is able to diagnose an eosinophilic allergic airway disease or blastomycosis, but this is considered a relatively "low return" undertaking to be done only if you are desperate and have no access to more sensitive sampling techniques like BAL and pulmonary fine needle aspiration.
10. **Trucut biopsies of small nodular livers** are probably a waste of money and effort, as well as being moderately dangerous because of the risk of excessive bleeding. Such biopsies suffer from two profound limitations. The first is that the small size of the biopsy will not be able to adequately represent the architectural distortion that is now the predominant lesion. For example, the biopsy might capture the center of a large hyperplastic nodule that looks like qualitatively normal liver, completely missing the broad bands of fibrosis or parenchymal collapse surrounding that hyperplastic nodule. Establishing whether the trucut biopsy is truly representative is essentially impossible when dealing with this type of liver. More importantly, however, *a small nodular liver is an end-stage liver for which the histology will provide neither insight into original pathogenesis nor useful information about prognosis.* The dismal prognosis has already been established just by the fact that the liver is small and nodular... so one must wonder what information, if any, one would get by any type of biopsy!

These are just general guidelines. There will always be circumstances in which a histology or cytology sample is indeed indicated despite general guidelines to the contrary. When in doubt, the telephone is your best friend!