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MAY 2014

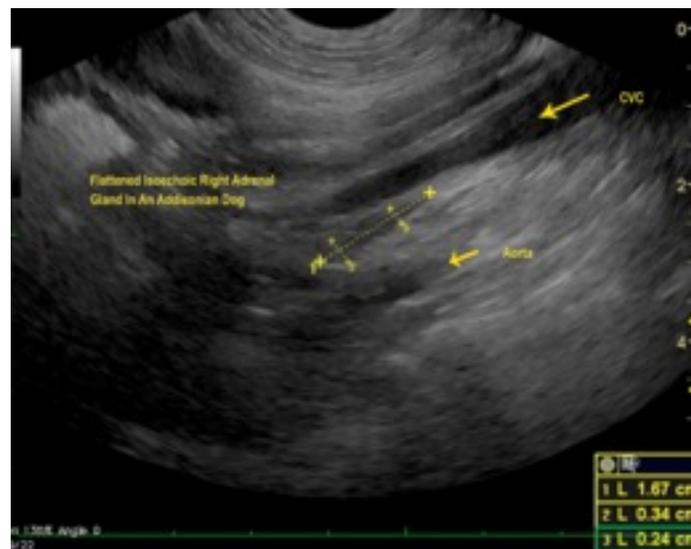
THE VALUE OF A NEGATIVE SONOGRAM



In many cases, a sonogram that leads to no particular finding is equally as valuable as finding dramatic pathology in any particular organ system. Unfortunately, clients and pet owners often expect that the

clinical sonographer will certainly find something abnormal on ultrasound, and value perception may be falsely diminished if all organ systems are within normal limits. Since sonograms often reveal significant pathology and/or allow for definitive clinical direction on the case approximately 80-90% of the time, the client develops the mindset that the sonogram will find something in all cases. In our Sonopath archive, we can demonstrate that the sonogram can find clinically pertinent lesions approximately 70% of the time. However, our database also reveals that the negative sonogram is just as valuable in the remaining 30% of the cases where nothing overt is presenting itself.

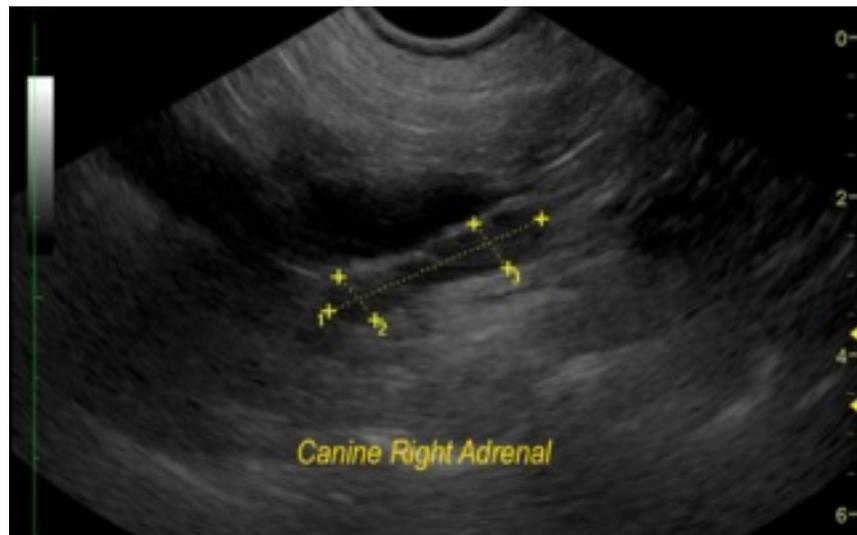
I have an old adage regarding a sick patient and the sonogram: “If the pathology is not in the abdomen and it is not in the chest it has to be orthopedic, metabolic, infectious or in the CNS.” For example, some patients, especially older dogs, present with inappetence or anorexia, and may have an apparently tense or painful abdomen on physical examination. Sonographically, we find that the internal abdominal organs are normal, and the patient is in fact experiencing referred pain related to disease in the vertebral column, such as diskospondylitis, with back spasms that mimic a tense abdomen. In this case, a negative sonogram proves extremely useful in that there is no painful disease causing anorexia within the abdomen, and directs the clinical work-up towards orthopedic issues or potential other causes of anorexia such as hidden neoplasia or other source of pain. This completely changes the direction of the case from a possible exploratory laparotomy on what was perceived as an acute abdomen to an elimination search for other medical pathology.



Another common scenario in clinical sonography practice is investigation of the “ADR” presentation. In this situation the patient is “just not himself,” and we are looking for pathology by means of the sonogram. In these cases, we often find a negative abdomen with perhaps normal geriatric findings of the major and minor organ systems. This can lead to exploring the thorax, with chest radiographs and/or sonogram, in order to rule out cardiac disease, lung disease, or pleural effusion that may be cardiogenic or non-cardiogenic. This thoracic investigation may yield negative results as well, and thus the vast field of possibilities with an initial ADR clinical complaint has now been narrowed considerably for this patient.

This allows for rapid and efficient refinement of the differential diagnosis and treatment, which generates greater client satisfaction as they see that their pet begins to improve soon after presentation.

A third example is the case in which we find via ultrasound a normal abdomen in, for instance, an intermittently vomiting patient. Additionally, the heart is working fine and no pleural effusions or other particular issues are noted in the thoracic cavity. Therefore, a double-cavity sonogram that is negative has considerably tailored the differentials list to orthopedic disease, infectious disease, metabolic disease or CNS disease. Our research abstracts at Sonopath.com demonstrate an alarming number of Addisonian patients in which the diagnosis has been backed into with this approach of an otherwise normal or unremarkable sonogram, along with a possibly hypocontractile heart and flattened adrenal glands. In other instances, the negative sonogram has directed the diagnostic workup of many cases to reveal occult CNS disease which may only initially present subtle signs such as lethargy, slow pupillary light reflex, or peripheral nerve deficits that may have not been overtly visible during the original workup, but detected on hindsight with a comprehensive neurologic examination. Lymphoma or other neoplasm of the central nervous system is a classic situation where this may occur. Tick-borne disease assessment, bone marrow evaluations, or empirical measures targeted at the most likely possibilities of pathology have significant value as well. We are in the business of improving quality of life in our patients and, at times, we don't have definitive answers but only probabilities of cause that can be narrowed efficiently in a stepwise fashion, in which both the positive and negative sonograms are the key to a focused diagnostic and therapeutic success.



Politically speaking, the issue we see most often regarding the poor perception of a negative sonogram is that pet owners are often not prepared adequately for the potential of an ultrasound with findings in normal limits because they are looking for an answer, and more significantly looking for the rationale behind the work-up in their emotional and economic effort. Therefore, preparing the owner for the potential of finding no particular lesion is important, and in this case a negative sonogram can be turned

into a positive scenario. In fact, a negative sonogram can be desirable because the clinician has ruled out a lot of malignant potential diseases in the process that can cause "Fido's" clinical presentation. The abdominal sonogram essentially rules in or rules out structural disease in 6 major organ systems as well as numerous free abdominal and thoracic pathologies. The thoracic sonogram typically will reveal cardiac disease usually from volume overload or non-cardiac thoracic disease that shows normal to subnormal cardiac volumes, or arrhythmogenic disease that can also cause vague clinical signs. This cardiogenic vs. non-cardiogenic disease scenario can be ascertained very quickly in the first number of moments of the echocardiogram or thoracic ultrasound by a skilled sonographer. Thus, in many cases a negative sonogram is good news for pet owners. If the sonogram is negative, then the medical team can progress to other differentials that are less likely in the diagnostic work-up.

As we can see, the value of a negative sonogram is tremendous and potentially more valuable than finding multi-system disease. A negative sonogram may in some cases be preferred, and can create higher client satisfaction and relief when they hear that, "we have ruled out the major serious diseases with the possibility of only a few more remote scenarios that can be equally malignant. But we now have more treatable pathological possibilities on which to focus our efforts." A "cup half full" approach to the negative sonogram is crucial in our ability to diagnose and begin treatment efficiently, and also helps support the concept that sonography is the most efficient diagnostic tool not only in our ability to quickly find existing pathology, but also to, just as quickly, rule out potential pathology. If we start with a differential diagnosis of 5-7 diseases the sonogram will often either find one of those or rule out most of them. Therefore, our differential is very quickly reduced to maybe 2 potentials if not found overtly with organ based lesions. I challenge anyone to name another instrument we have in veterinary medicine that can do this on a daily basis, with non-invasive measures, minimal to no sedation, and do so quickly when performed by a skilled sonographer and especially one who is trained in efficiency techniques using modern technology and more recent workflows. When a thorough 10-15 minute sonogram is performed at a high level, the patient and client stress is minimized in this routinely quick procedure. A negative scan can also serve as a baseline scan for the future as emerging pathology can pop up at any time, often with no overt signs. It is possible for a patient to have a negative scan one day, only to present one week later with an aggressive lymphoma as evidenced by sonography. The negative ultrasound occurs only 30% or less of the time in our experience at SonoPath.com, but I still like its potential for value perception.

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This article is an excerpt from the upcoming pocket guide offered by SonoPath.com: "The Curbside Guide, Diagnosis & Treatment of Common Sonographically Detected Disease." Available Spring 2014.

Ultrasound is our utility, veterinary medicine is our passion

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