Hard to Diagnose Conditions: Use of Ultrasound

INTERNATIONAL VETERINARY EMERGENCY AND CRITICAL CARE SYMPOSIUM 2018

Gregory R. Lisciandro, DVM, DABVP, DACVECC
Hill Country Veterinary Specialists & FASTVet.com, Spicewood, TX, USA

We will discuss traditionally difficult conditions often treated based suspicion rather than evidence-based information. The Global FAST® Approach of using AFAST®, TFAST® and Vet BLUE® in combination as a single ultrasound examination can tackle many of these traditional conundrums to our patient's benefit.

TRADITIONALLY DIFFICULT CONDITIONS DETECTED BY AFAST®, TFAST® AND VET BLUE®—THE GLOBAL FAST® APPROACH

Where Is My Patient Bleeding?

Global FAST®—AFAST®, TFAST® and Vet BLUE® survey 4 spaces—cavities (abdominal cavity, retroperitoneal space, pleural cavity, pericardial sac) and lung and should be applied to all coagulopathic and at-risk-for-bleeding cases. Interventions may be triggered to better treat the patient (often prior to overt clinical signs) regarding transfusion therapy and interventional procedures.

Is It Feline Asthma or Left-sided Congestive (CHF) Heart Failure?

The use of VET BLUE® lung ultrasound standardized examination rapidly (<90 seconds) answers this historically difficult question because the Vet BLUE® profiles between the feline asthmatic (dry lung) and feline CHF (wet lung) are radically different.

Does My Patient Have Left-sided CHF?

The finding of absent B-lines (Dry) **all** views during Vet BLUE® rules out left-sided CHF point-of-care in <60–90 seconds and rules against empirical diuretic therapy.

Does My Patient Have Pulmonary Thromboembolism (PTE)?

Better evidence may be gained for the presence of PTE by 1) using the TFAST® long-axis 4-chamber view and evaluating RV:LV ratio, and 2) through the use of Vet BLUE® and the finding of the Wedge Sign, representative of small infarcts on the lung surface.

Does My Patient Have Pulmonary Hypertension (PHT)?

The respiratory case is not uncommonly being treated for pneumonia that in fact has PHT often with the complication of right-sided congestive heart/volume overload failure (R-CHF). The TFAST® long-axis 4-chamber view (RV:LV ratio) and characterizing the caudal vena cava (CVC) are means to support the presence of PHT and R-CHF, explaining why your patient is not improving on antibiotics and fluid therapy, thus triggering an echo. Small animal patients with right-sided volume overload often have gastrointestinal signs and you end up doing the wrong intervention of replacing losses with higher fluid rates (and you are actually killing your patient).

Left Atrial Tears in Mitral Valve Disease More Common than You Think?

Using Vet BLUE® and TFAST® first line and during hospitalized care as part of your cardiac evaluation helps detect this otherwise missed condition that is far more common than we are taught.

How to Diagnose and Monitor Pneumothorax by Using the Lung Point?

PTX is not only diagnosed point-of-care using TFAST®, but may also be monitored through the use of the Lung Point.

How to Better Interpret the Thoracic Radiograph (TXR)—Lung

You are missing or misinterpreting pulmonary disease by not using **proactive** Vet BLUE® lung ultrasound. Lung ultrasound is extremely sensitive for lung surface pathology, more than TXR and likely computed tomography (CT) for many conditions. We have shown that Vet BLUE® detects alveolar-interstitial edema over TXR (Ward *et al*. In Press). Use Vet BLUE® to complement TXR to help better pick your next best and more accurately and expediently diagnose and treat.

How to Better Interpret the Thoracic Radiograph (TXR)—Cardiac

You are missing pericardial effusion, left- and right-sided heart disease, DCM and intra-cardiac masses by not **routinely** using TFAST® and imaging the heart.

Does Your Collapsed Dog Have Anaphylaxis (AX)?

Gallbladder wall striation due to gallbladder intramural edema is a marker for canine AX. How to recognize the sonographic finding and why you should look **beyond the diaphragm** for other important rule outs is imperative (pericardial effusion, DCM, right-sided heart failure) and all veterinarians need to be aware of the medically-treated canine AX-related heparin-induced hemoabdomen.

Why You Should Do Vet BLUE® and Global FAST® in All Vomiting Patients?

Aspiration pneumonia may be detected point-of-care in your hospitalized patients using Vet BLUE®. Moreover, some of your vomiting and diarrhea cases are actually right-sided volume overloaded (increased RV:LV ratio and FAT CVC) and you are contributing further to the problem.

CONCLUSION

We are missing important conditions by not implementing the Global FAST® approach **everyday to nearly every patient** as an extension of the physical exam (triage, during patient rounds, pre-anesthetic, peri-operative, part of wellness exam, etc.). Global FAST® is changing veterinary medicine diagnostic and treatment paradigms by capturing disease otherwise missed without ultrasound. The prevalence of these many traditionally difficult conditions to diagnose is much greater than previously documented because we are using the wrong test(s). Lastly, POCUS or targeted ultrasound examinations are dangerous because of satisfaction of search error—you only looked at the heart (poor volume) and the problem was in the abdomen (low grade hemoabdomen). The Global FAST® approach should be used as an extension of the physical examination everyday on nearly every patient to better diagnose (better create a patient problem list and better pick the next best test), better **look** for complications, better **look** for co-morbidities, and ultimately **better** improve veterinary care and save lives.

References

1. Lisciandro GR, *et al*. http://www.ncbi.nlm.nih.gov/pubmed/24382172 *Vet Radiol and Ultrasound* 2014;55(3):315–22.

2. Lisciandro GR, *et al*. http://www.ncbi.nlm.nih.gov/pubmed/24382172 *J Vet Emerg Crit Care* 2017;27(3):267–277.

3. Ward JL, Lisciandro GR, Tou SP, *et al*. Evaluation of point-of-care lung ultrasound (Vet BLUE protocol) for the diagnosis of cardiogenic pulmonary edema in dogs and cats with acute dyspnea. *J Am Vet Assoc* 2017;250(6): 666–675.

4. Lisciandro GR, *et al*. Absence of B-lines on lung ultrasound (Vet BLUE protocol) to rule out left-sided congestive heart failure in 368 cats and dogs. *J Vet Emerg Crit Care* 2016 [Abstract].

5. Lisciandro GR, Romero L, Fosgate GT. The Frequency of B-Lines and other lung ultrasound artifacts during Vet BLUE in 91 healthy puppies and kittens. *J Vet Emerg Crit Care* 2018 [Abstract].

6. Lisciandro GR. Evaluation of initial and serial combination focused assessment with sonography for trauma (CFAST) examination of the thorax (TFAST) and abdomen (AFAST) with the application of an abdominal fluid scoring system in 49 traumatized cats. Abstract *J Vet Emerg Crit Care* 2012;22(2):S11

7. Ward JL, Lisciandro GR, DeFrancesco TC. Distribution of alveolar-interstitial syndrome in dyspneic veterinary patients assessed by lung ultrasound versus thoracic radiography. *J Vet Emerg Crit Care* accepted 2016, In Press.

8. Kulhavy DA, Lisciandro, GR. The Use of VetBLUE to evaluate lung pathology in dogs with severe pulmonary hypertension without left-sided heart disease. *J Vet Emerg Crit Care*, 2018 [Abstract].

9. Kulhavy DA, Lisciandro GR. Use of a lung ultrasound examination called Vet BLUE to screen for metastatic lung nodules in the emergency room. *J Vet Emerg Crit Care*, 2015 [Abstract].

10. Lisciandro GR. Abdominal FAST (AFAST)-detected hemorrhagic effusion in 11 dogs with acute collapse and gallbladder wall edema (halo sign) with presumed anaphylaxis. *J Vet Emerg Crit Care* 2016 [Abstract].

11. Lisciandro GR. Focused abdominal (AFAST) and thoracic (TFAST) focused assessment with sonography for trauma, triage and monitoring in small animals. *J Vet Emerg Crit Care* 2011;20(2):104–122 [Abstract].

12. Lisciandro GR, Lagutchik MS, Mann KA, *et al.* Evaluation of an abdominal fluid scoring system determined using abdominal focused assessment with sonography for trauma (AFAST) in 101 dogs with motor vehicle trauma. *J Vet Emerg Crit Care* 2009;19(5):426–437.

13. Lisciandro GR. Case series of dogs and cats with the gallbladder halo sign associated with pericardial effusion and right-sided heart failure during FAST exams. Unpublished data, 2014.

14. McMurray *et al*. Focused assessment with sonography in non-traumatized dogs and cats in emergency and critical care setting. *J Vet Emerg Crit Care* 2016;26(1):64–73.

15. Lisciandro GR. The use of the diaphragmatico-hepatic (DH) views of the abdominal and thoracic focused assessment with sonography for triage (AFAST/TFAST) examinations for the detection of pericardial effusion in 24 dogs (2011–2012). *J Vet Emerg Crit Care* 2016;26(1):125–31.

SPEAKER INFORMATION

(click the speaker's name to view other papers and abstracts submitted by this speaker)

Gregory R. Lisciandro, DVM, DABVP, DACVECC
Hill Country Veterinary Specialists & FASTVet.com
Spicewood, TX, USA