FAST ULTRASOUND TECHNIQUES – SIMPLE SKILLS THAT CAN SAVE LIVES

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References

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- Evaluation of an abdominal fluid scoring system determined using abdominal focused assessment with sonography for trauma in 101 dogs with motor vehicle trauma. Lisciandro et al. JVECC 19(5) 2009, pp 426–437.

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- Focused Ultrasound Techniques for the Small Animal Practitioner. Gregory R. Lisciandro (Editor), January 2014, Wiley-Blackwell.
- Joint Trauma System Clinical Practice Guidelines – Clinical Management of Military Working Dogs
  - http://usaisr.amedd.army.mil/cpgs.html

Background

- Focused Assessment with Sonography for Trauma (FAST) Exam
  - 1990s screening technique for blunt/penetrating trauma in human patients
  - Abdominal 4-point scan for evidence of free fluid in the abdominal, pericardial, and pleural cavities
- Veterinary anatomy requires adaptation of the technique
  - AFAST = Abdominal FAST exam
  - TFAST = Thoracic FAST exam

FAST and the 4 P's of Human FAST

Rozycki, et al Annals of Surgery Vol 228, No. 4, p 557-567 1998

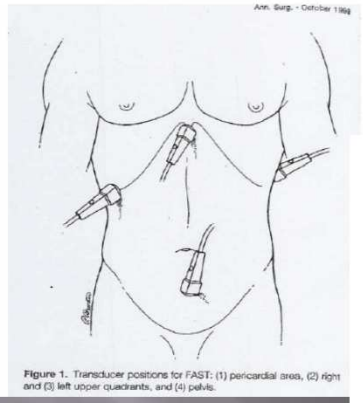
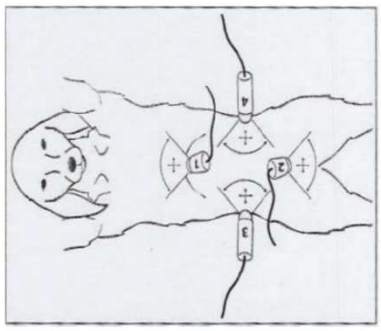
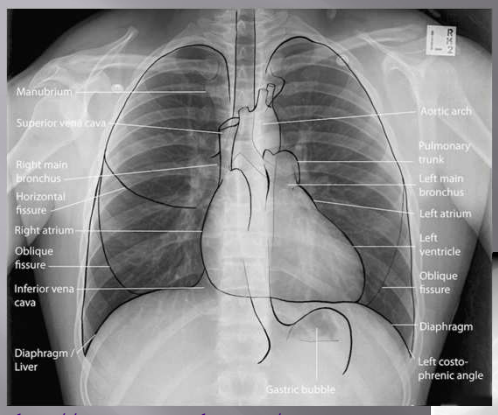


Figure 1. Transducer positions for FAST: (1) pericardial area, (2) right and (3) left upper quadrants, and (4) pelvis.

Veterinary FAST with the 4 P's of Human FAST

Boysen et al, JAVMA Vol 225, No.8, p 1199 October 15, 2004





http://www.anatomybox.com/

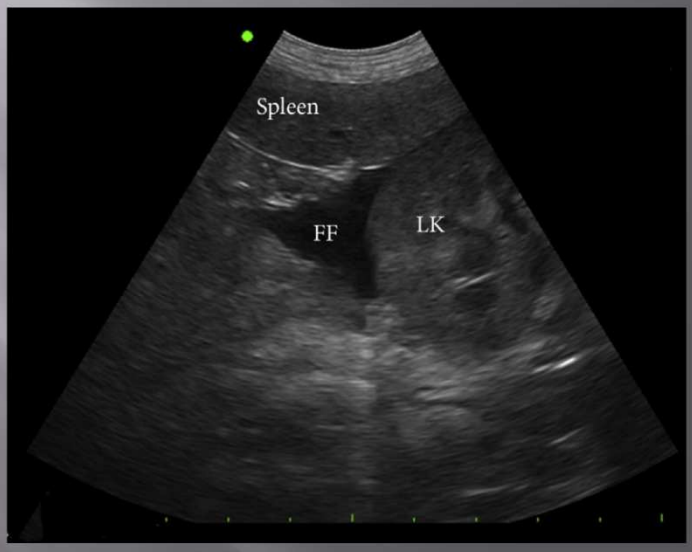
Background

- Substantial interest in clinical practice
  - Relatively inexpensive
  - Radiation-sparing, non-invasive
  - Portable, point-of-care imaging
  - Minimal patient restraint
  - Performed quickly and simultaneously with other diagnostic and therapeutic interventions
- Initial and serial FAST examinations improve outcomes in human patients
- Veterinary applications increasing and similar

Abdominal FAST Exam (AFAST)

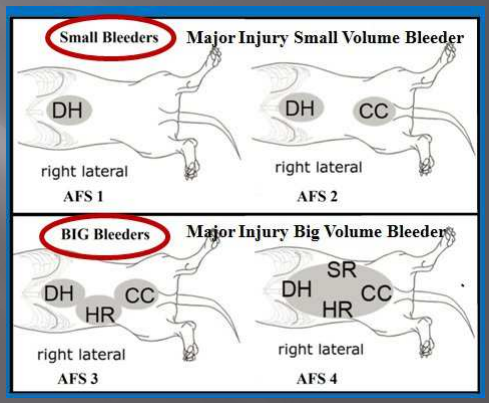
- Detection of free abdominal fluid
  - Blood, urine, bile, other causes for ascites
  - More sensitive than radiographic serosal detail
  - US-guided abdominocentesis
- Abdominal Fluid Score (AFS)
  - Repeat at 4 hours in stable patient, more frequently in unstable patients
  - Increase over time suggests ongoing hemorrhage
- AFAST^3 = trauma, triage and tracking

AFAST³



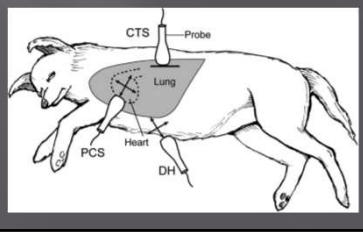
AFAST³

- Is free fluid indicative of internal injury?
- How much fluid is present?
- What does this fluid signify?
- Is the quantity of fluid static, increasing, or decreasing over time?



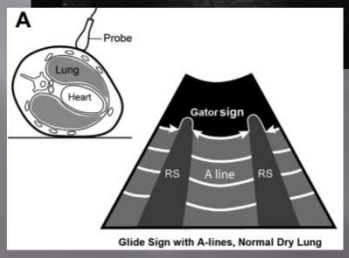
Thoracic FAST Exam

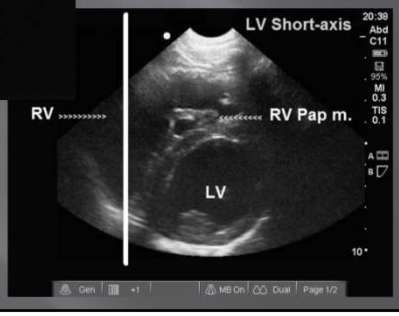
- Detection of free air and free fluid
  - Pneumothorax
  - Pleural effusions
  - Pericardial effusions
- Trauma, nontrauma, post-interventional and post-surgical patients
- US-guided pleurocentesis or pericardiocentesis
- 5-point scan
  - Chest tube site (CTS)
  - Pericardial site (PCS)
  - Diaphragmaticohepatic (DH)



TFAST[3]

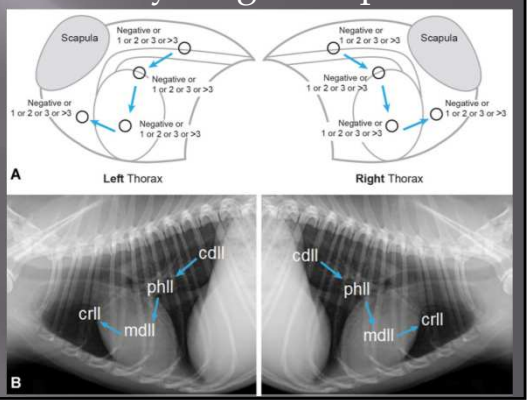
- Interpretation requires more experience
  - Respiratory motion
  - Aerated versus non-aerated lung
  - Pleural vs pericardial effusion





Veterinary Bedside Lung Ultrasound Exam (Vet BLUE)

- Extension of Thoracic FAST exam
- Serial exams similar to auscultation
- Based on wet lung versus dry lung concept



Vet BLUE

- Advantages
  - Unstable patients awaiting radiography
    - Fluid or soft tissue/cellular displacement of aerated lung
      - Interstitial/alveolar edema, hemorrhage, inflammation, benign or malignant nodules
  - Unaffected by patient or environmental noise
- Limitations
  - Pathologic conditions must reach the periphery
  - Deeper lesions, surrounded by aerated lung, missed
  - Radiography provides comprehensive evaluation

Summary

- AFAST + TFAST + Vet BLUE = Global FAST[3]
- Thoracic radiography retains importance
- Significant Ultrasound Trends
  - Increasing availability
  - Increasing affordability
  - Numerous equipment options
- Basic skills are very productive in abbreviated emergency and serial point-of-care exams
- Focused exams are easy to learn and use frequently in routine practice

Summary

- Identification of fluid is easy, even in thorax
- Interpretation of lung more difficult
- Don't be cavalier, complacent or afraid
- Vital tool for practitioners
- Valuable information for initial assessment and continued management of critical care patients

Simple Skills (Trained Responses), Save Lives

Questions

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