Original Study

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Evaluation of a thoracic focused assessment with sonography for trauma (TFAST) protocol to detect pneumothorax and concurrent thoracic injury in 145 traumatized dogs

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Abstract

Objective: To estimate the relative accuracy of a thoracic focused assessment with sonography for trauma (TFAST) protocol for rapid diagnosis of pneumothorax (PTX) and other thoracic injury in traumatized dogs.
Design: Prospective case series.
Setting: Private veterinary emergency center.
Animals: One hundred and forty-five client-owned dogs evaluated within 24-hours of injury.
Interventions: Thoracic focused assessment with sonography for trauma protocol.
Measurements and Main Results: Traumatized dogs were evaluated with a conventional ultrasound (US) machine using a standardized 4-point thoracic FAST protocol before thoracic radiography (CXR) and thoracocentesis. PTX was diagnosed by the absence of the 'glide sign,' defined as the lack of the normal dynamic interface between lung margins gliding along the thoracic wall during respiration. Concurrent thoracic trauma was diagnosed by the presence of pleural or pericardial fluid or the presence of a 'step sign,' defined as an abnormal glide sign. Accuracy of TFAST was calculated relative to CXR findings.
Results: Overall sensitivity (Se), specificity (Sp), and accuracy of TFAST relative to CXR were 78.1% (95% CI; 61.5, 89.9), 93.4% (95% CI; 87.4, 97.1), and 90.0%, respectively. Se and Sp were higher in dogs with penetrating trauma (93.3%, 96.0%) and for the evaluator with the most clinical experience (95.2%, 96.0%); only Se between the most experienced compared with others was statistically significant ($P < 0.05$). TFAST documented other concurrent thoracic injury. Median time for TFAST was 3 minutes.
Conclusions and Clinical Relevance: TFAST has the potential to rapidly diagnose PTX and other thoracic injury and guide therapy, including potentially life-saving interventions, in traumatized dogs.

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Introduction

Pneumothorax (PTX) has been described as the most preventable life-threatening trauma sequela, occurring in approximately 20% of human survivors presented to trauma centers.[1–4] In dogs and cats with blunt chest trauma, the incidence of PTX and concurrent thoracic trauma has been reported to range from 13% to 50%.[5–10] Mortality rates in dogs with pulmonary trauma have been reported to range from 10% to 18%.[11–13] Historically, PTX has been diagnosed in humans based on clinical suspicion, physical examination, and chest radiography (CXR), but with inconsistent reliability.[14–18] In small animal veterinary patients, physical examination has been likewise unreliable, and thoracic radiography is considered the mainstay for the diagnosis of

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