Taking the Drama out of Trauma: Trauma Mistakes to Avoid!
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Trauma is one of the most common emergencies seen in the busy emergency room. Examples of common veterinary trauma presentations include motor vehicle accidents (i.e. hit by car) interaction with other animals, interaction with humans, fall from heights, and penetrating trauma such as gunshot wounds, knife wounds, and impalement by sticks.

Trauma may affect only one body system or it may affect multiple organ systems. For this reason, the initial approach to the trauma patient must be rapid, thorough, and detailed to decrease further morbidity and mortality.

As a result, the initial triage evaluation should be rapid, developing a problem list outlining life-threatening conditions.

**Mistake #1: Over-emphasize and focus only on the glaringly obvious external injury**

For example, several studies have shown that animals hit by car with fractures had evidence of pneumothorax 47.1% of the time. Furthermore, 36% of dogs and 63% of cats that fell from high rises had evidence of pneumothorax on examination.

Additionally, about 1/2 of the patients hit by a car that presented with a fractured limb (as an example) also had a pneumothorax. If the clinician only focuses on the fracture, they could miss the life-threatening pneumothorax.

**Mistake #2: Diagnosing a clinically significant pneumothorax on radiographs**

The astute clinician often makes the diagnosis of a pneumothorax based on history and examination alone. Common examination abnormalities include an increased respiratory rate and effort characterized by a short and shallow breathing pattern, dull lung sounds dorsally, and muffled heart sounds. Less specific examination abnormalities may include pale or cyanotic mucous membranes, poor pulses, and an abnormal posture with the head and neck extended and elbows abducted. While useful in the diagnosis of a pneumothorax, thoracic radiographs risk increased stress on the compromised patient. Radiographic signs of pneumothorax include elevation of the cardiac silhouette from the sternum, collapse of the lung lobes, and absence of vascular markings out to the periphery of the thorax.

Recently, the use of ultrasound has been documented for rapid detection of pleural space disease, specifically the "TFAST" (thoracic focused assessment with sonography for trauma) procedure. It does, however, require practice to be competent in its use.

When radiographs are not suitable, the unstable patient may benefit from thoracocentesis, which can be both diagnostic and therapeutic. The equipment needed for this procedure includes clippers, scrub, sterile gloves, a 10-60ml syringe, 3-way stopcock, butterfly catheter or needle, and extension tubing. The site preparation and eventual needle placement for a patient suspected of a pneumothorax is on the dorsal 1/3
of the thorax between the 7th-10th intercostal spaces. The needle is inserted cranial to the rib to avoid the intercostal artery, vein, and nerve located caudal to each rib. Air is aspirated until negative pressure is obtained.

A chest tube is indicated when thoracocentesis needs to be repeated multiple times over a short period of time or when the clinician cannot achieve negative pressure on simple thoracocentesis. Large bore chest tubes require sedation or general anesthesia. Smaller bore chest tubes are also available, placed via the modified Seldinger technique with the patient awake or receiving local analgesia. Equipment required for chest tube placement includes clippers, surgical scrub, surgical blade, local analgesia, suture material, the thoracostomy tube, 3-way stopcock and syringes for initial aspiration. The chest tube can be used intermittently or attached to a suction device for continuous suction. The technique for chest tube placement will depend on the type of tube used, including surgical and trocar methods for the larger bore tubes or the modified Seldinger technique for the smaller bore tubes. Like the thoracocentesis, surgical preparation of the site between the 7th-10th intercostal spaces is recommended.

**Mistake #3: Not fluid resuscitating a patient effectively**

The “shock dose” of fluids is extrapolated from the blood volume of the patient. The dog’s blood volume is estimated to be 90 ml/kg while the cat’s blood volume is estimated to be 60 ml/kg. Rather than give the entire shock volume, emergency critical care specialists have used smaller aliquots when trying to stabilize hypovolemic patient. For example, rather than giving a canine patient 90ml/kg, the clinician would be a smaller aliquot, such as 1/4 to 1/3 of the shock dose (20-30ml/kg) of IV crystalloids and then re-assess that patient.

**Mistake #4: Using corticosteroids**

Corticosteroid use is not currently recommended in the treatment of head trauma, and for that matter almost any type of trauma. Although corticosteroids have anti-inflammatory effects, they are associated with several negative issues including hyperglycemia, immunosuppression, delayed wound healing, and gastric ulceration. Hyperglycemia has been shown to be a negative prognostic indicator in humans and dogs with severe head injury. Regarding spinal trauma, the use of methylprednisolone sodium succinate (MPSS) is currently considered the gold standard of care in spinal trauma (30 mg/kg IV once, then 15 mg/kg IV 2 and 4–6 hours later). The time frame for reported benefits in human patients is administering the MPSS within 8 hours of the traumatic event. After this time frame, there has been no documented benefit of steroid use in helping improve prognosis for return to function.

**Mistake #5: Not performing your FAST ultrasounds**

The focused assessment of sonography for trauma (FAST) ultrasound examination is a rapid, bedside test that can be performed in trauma patients in helping to provide valuable prognostic and diagnostic information. The FAST examination allows the clinician to rapidly diagnose the presence of free fluid and aid in the diagnostic approach for that patient. Using this ultrasound technique, the clinician can detect and sample small amounts of ascites (abdominocentesis, cytology, clinicopathologic testing, etc.). As compared to a “blind” abdominocentesis where 5-25 ml/kg of ascites must be present for the clinician to obtain a sample, using the FAST technique only 2 ml/kg of ascites needs to be present for a positive fluid identification. To perform the FAST examination, it is recommended that the patient is placed in right
lateral recumbency if stable. The clinician then evaluates 4 specific sites of the abdomen: caudal to the xiphoid, cranial to the bladder, and right and left dependent flank.

Summary
Trauma is common in small animal medicine. Most patients respond well to rapid and aggressive supportive therapy. Concurrent injuries are common and the clinician should carefully evaluate their patients to address each specific medical condition, to reduce patient morbidity and mortality.

References