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THORACIC BITE INJURY

Introduction

Thoracic bite wounds occur most frequent in smaller dogs and cats. Bite wounds occur bilaterally or unilateral. Inflicted trauma may be superficial or may penetrate deep into the thoracic (and abdominal) cavity. Depending on the extent of the inflicted trauma, treatment varies from relative simple surgical wound exploration and management to an extensive procedure involving unilateral or bilateral thoracotomy or median sternotomy.

Initial evaluation should concentrate on the major body systems (cardiovascular, lungs, brain) since a patient with significant thoracic trauma may have other serious and life-threatening injuries.

In cases of severe compromise of respiratory or circulatory function immediate treatment should be aimed at stabilization of these functions. Thoracentesis and mechanical ventilation prior to the actual surgical procedure may be necessary in cases of severe pneumothorax.

On initial presentation iv fluids, oxygen treatment and analgesics may be instigated as necessary. A thorough examination of the whole thoracic (and abdominal) wall should be performed. Shaving of the traumatized area is mandatory to check for additional trauma and proper evaluation of the extent of skin and subcutaneous involvement. Most patients are presented in a stable situation allowing for a systematic evaluation of the extent of injury before induction of anesthesia.

Thoracic radiography is essential in diagnosis and decision making in thoracic trauma. Ultrasonography an CT may be additional diagnostic instruments.

Superficial thoracic trauma

Proper evaluation of trauma to the skin, subcutaneous structures and muscles involves shaving of an appropriate area of the skin and should be bilateral in many cases.

The extent of superficial wounds should be evaluated to allow for proper treatment. Wounds should be examined by probes to investigate the subcutaneous extend and depth. Minimal treatment consist of flushing and drain placement. Exploratory surgery is necessary in those cases with more than minimal superficial trauma

The use of antibiotics is indicated especially in larger wounds. Further development of skin – or subcutaneous tissue necrosis should be considered in cases of severe crushing or when avulsion of the skin and subcutis has occurred.

Bite trauma to the muscle off the thoracic wall should also be addressed by removing parts that are or will become necrotic because of trauma to the blood supply.

Penetrating thoracic injury

In cases of deeper thoracic bite wounds, trauma tot the ribs, intercostal muscles, lungs, larger vessel, diaphragm and underlying abdominal organs as stomach and liver may have occurred.

Trauma to multiple ribs and accompanying intercostal muscles often leads to a flail chest. Trauma to the lungs may occur as a direct result of penetrating canine teeth or as a result of rib-fractures and will result in limited or severe pneumothorax.

Surgical treatment should be aimed at restoration of the respiration, (circulation) and of the continuity and stability of the thoracic wall.

Penetrating trauma to the lungs should always be checked for air-leakage. If no leakage is present and cannot be provoked by increasing ventilatory pressure it may be considered to abstain from further measures. Patent air-leakage may be addressed by suturing the affected lunglobe or (partial) lunglobe resection.

Attempts to align and secure fractured ribs are often timeconsuming and unnecessary in most cases. Rib fragments protruding into the thoracic cavity should be aligned or resected.

Flail chest areas should be stabilized by suturing the affected proximal and distal ribs to the bordering stable ribs. Surgical mesh may be used to acquire adequate stability or to cover larger defects.

Adequate lavage of the thoracic cavity is performed before thoracic closure. Restoration of the negative pressure is mandatory and is accomplished by placement of a chest drain or -tube.

Only in cases of trauma limited to the thoracic wall it can be considered to remove the drain once negative pressure has been restored and retained and adequate spontaneous breathing has been resumed.

COMPANION ANIMAL

THORACOLOGY

In cases of lung-involvement and/or severe thoracic wall trauma as multiple rib-fractures and flail chest the chest tube is maintained after surgery.
Chest tubes can be removed once air-leakage is under control for at least 24 hours.

Conclusion

An optimal management of thoracic bite wounds in small dogs includes surgical exploration of the wound and of the thoracic cavity in the presence of flail or pseudo-flail chest, fractured ribs, radiological evidence of lung contusion, pneumothorax or any combination of these.