Respiratory Surgery

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KEYWORDS

• Surgery • Upper airway • Cattle • Larynx • Pharynx

KEY POINTS

- Inspiratory dyspnea is a common clinical sign of upper airway obstruction.
- Endoscopic evaluation of the upper airway helps localize the obstruction.
- Emergency drugs and a surgical kit to place a tracheostomy tube should be readily available when working on dyspneic animals.
- Pharyngeal trauma can cause severe head and neck cellulitis, causing dysphagia and dyspnea.
- Mandibular fractures are more frequent in calves and can be repaired with an intraoral splint when it involves the rostral mandible.

Video content accompanies this article at http://www.vetfood.theclinics.com.

INTRODUCTION

Performing respiratory surgery in the field is an intimidating endeavor. Proper anesthesia of the head is challenging and sedation of an animal struggling to breathe is risky. However, with a good anesthesia protocol, surgical plan, and the right equipment, upper airway surgery can be successfully performed outside of a hospital setting. This article describes the different disorders affecting the upper airway. It highlights the clinical signs, the diagnostic approaches, and therapeutic options. Advanced surgeries, performed in referral centers, are briefly described to make readers aware of other possible treatment options to relieve upper airway obstruction.

CLINICAL SIGNS

Disorders affecting the upper airway can have an acute (eg, foreign body) or chronic (eg, cyst or neoplasia) evolution. They can potentially lead to obstruction causing various degrees of inspiratory dyspnea. The obstruction is accompanied by the characteristic inspiratory stridor (Video 1). Chronic cases may have secondary aspiration

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pneumonia. It is therefore important to carefully evaluate the chest through auscultation and ideally an imaging technique before investing time and money in surgery. Portable radiography can be used in a field setup to evaluate the lungs in young calves.[1,2] However, ultrasonography is more readily available and was shown to be more efficient in detecting lung consolidation in calves and in older cattle (**Fig. 1**).[3–6] In referral centers, computed tomography (CT) can also be used to detect pneumonia in calves.[7,8]

Some conditions cause nasal discharge, asymmetric airflow through the nostril, skull deformation, chronic cough, and ocular discharge.[9] In some cases, swelling of the soft tissue surrounding the involved structure is present (eg, pharyngeal trauma).

DIAGNOSIS

Through the case history and a complete physical examination, a presumptive diagnosis can usually be reached. A careful palpation of the head and neck can help localize the site of the obstruction. Oral palpation allows evaluation of the larynx and oropharynx. This evaluation can be performed by using the tongue of the animal as a speculum or any other type of mouth opener. The hand of the examiner is placed in a vertical orientation to pass between the cheek teeth. It is then placed in a horizontal position to palpate the larynx. This manipulation may exacerbate the respiratory distress. Therefore, it may need to be delayed after relieving the airway with the placement of a temporary tracheostomy tube.

The diagnosis is obtained by performing a nasal endoscopy. The technique has been described and is performed without sedation in most cattle.[10,11] A scope 9 mm in diameter and 1 m long is used and allows evaluation of the nasopharynx, larynx, and proximal trachea. The structures seen are the nasal ventral meatus, the nasal septum, the pharyngeal septum, the opening of the eustachian tube, the epiglottis, the soft palate, the arytenoids, and the vocal cords (**Fig. 2**, Video 2). The opening of the

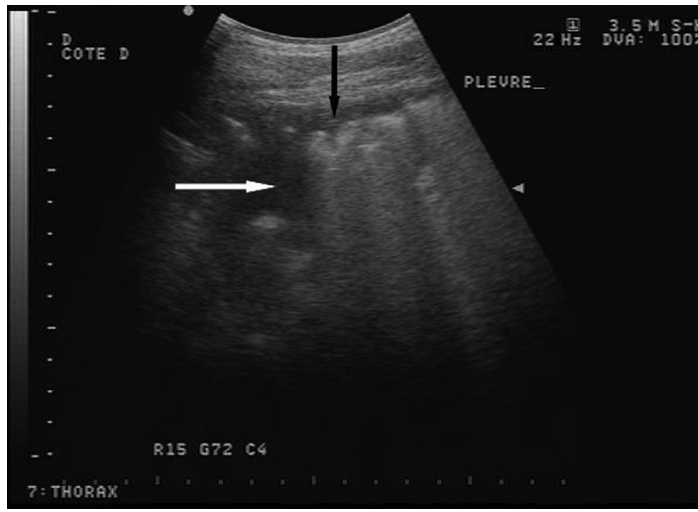

Fig. 1. Ultrasonographic evaluation of the right caudoventral thoracic cavity of a 2-year-old Holstein heifer with *Mannheimia haemolytica* bronchopleuropneumonia. A 3.5-mHz curvilinear probe was used to obtained this picture. Fluids can be seen in the thoracic cavity (*black arrow*). The visceral pleura is irregular and an abscess is forming in the lungs (*white arrow*). (*Courtesy of* Dr Marie Babkine, University of Montréal, St-Hyacinthe, Québec, Canada.)