

Tracheal collapse in a Belgian Blue Calf: radiographic and endoscopic findings



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SUMMARY

A 40-day-old Belgian Blue calf was referred with history of wheezing and dyspnea an occasional cough. Upon physical examination breathing was stridulous and tracheal palpation elicited a mild cough. Auscultation of the respiratory tract showed harsh and tracheal sounds that refer to the chest, no abnormalities in the lungs. Diagnostic tests were necessary to make at the differential diagnosis of major respiratory diseases, that include: chronic bronchitis, infectious tracheobronchitis, tracheal obstruction due to intraluminal disease or extraluminal compression or pneumonia.

Radiographic and endoscopic examination revealed a tracheal collapse/stenosis at the thoracic inlet. In this case, physical examination was insufficient to obtain a diagnosis, only just adding diagnostic imaging, such as radiograph, together with over imaging techniques has allows for the direct visualization of the mucous membrane and the lumen of the nasal, pharyngeal, and tracheal region, has led to a certain diagnosis.

Tracheal collapse/stenosis was suspected, based on clinical findings and confirmed by diagnostic imaging. A progressively worsening dyspnea is good presumptive evidence for tracheal collapse and must however be considered in a differential diagnosis. Nonspecific etiology has not been proven, but cranial thoracic trauma, tracheostomies and congenital defects have been reported as causes in the literature. Tracheal collapse or stenosis in calves are infrequently and rare.

KEY WORDS

Tracheal collapse; calf; thoracic radiograph; endoscopy.

CASE HISTORY

A Belgian Blue calf (75 kg; 40-day-old) was referred to the Preventive Medicine Service and Breeding Clinic of the Veterinary Teaching Hospital (OVUD) of University of Padua with history of wheezing and dyspnea after breeding and exercise. The farmer reported a respiratory problem worsened over time, signs of trauma were not present, and problem of dystocia were not recorded after calving. The calf was treated with an antibiotic therapy and corticosteroids for at least 5 days without improvement in farm prior to admission to the Veterinary Hospital. The calf was moderately depressed on clinical examination. Heart rate (110 beats/min) and temperature (39.2°C) were just above the normal, while increased respiratory rate (96 breaths/min). Breathing was stridulous and there was an occasional honking cough. Tracheal palpation elicited a mild cough.

A respiratory disease total score of 4 was assigned based on the Wisconsin (WI) scoring system¹ that assesses five clinical signs including ocular discharge, nasal discharge, head tilt or ear position, induced or spontaneous cough and rectal temperature, each partitioned into four levels of severity (from 0 to 3). A total respiratory score over 4 are considered as an animal affected by a respiratory disease.

Auscultation of the respiratory tract showed harsh and tracheal sounds in the chest, stertorous respiration was worse during inspiration, and no abnormalities sounds were present in the lungs. Diagnostic tests were necessary to arrive at

a differential diagnosis of major respiratory diseases, that include chronic bronchitis, infectious tracheobronchitis, tracheal obstruction due to intraluminal disease or extraluminal compression or pneumonia.

Hemochromocytometric and hematobiochemical analyses were unremarkable, values did not show severe alterations of metabolic functions².

Radiographic and endoscopic evaluation was carried out. These techniques are considered excellent on the evaluation of first part of the respiratory tract. For this procedure the animal was restrained and sedated with xylazine (0.05 mg/kg IV).

The thoracic radiograph was performed in a latero-lateral position using a portable X-ray unit AJEX Meditec[®] (140 H)³, with exposure setting of 4 mAs and 75 kVp. Radiographies showed tracheal collapse and stenosis at the posterior cervix (C7) to thoracic inlet region (T1) (Figure 1).

In this case, physical examination was insufficient to obtain a diagnosis, only just adding diagnostic imaging, such as radiograph, together with over imaging techniques had allows for the direct visualization of the mucous membrane and the lumen of the nasal, pharyngeal, and tracheal region, had led to a certain diagnosis. After the response from the radiograph, the patient was subjected to rhinotracheobronchoscopy to investigate the upper respiratory tract. The flexible video-endoscopic machine (PENTAX EPM330P - 5.0 millimeters in diameter and 1.60 meters of length) was inserted into the ventral nasal meatus over to the pharynx and larynx into the trachea. Images of the mucosal surface and lumen were visualized (Figure 2).

The trachea was collapsed dorsoventrally at the thoracic inlet, with a severe collapse encompassing about 75% in functional of the airway diameter, dorsal membrane almost contacts ven-

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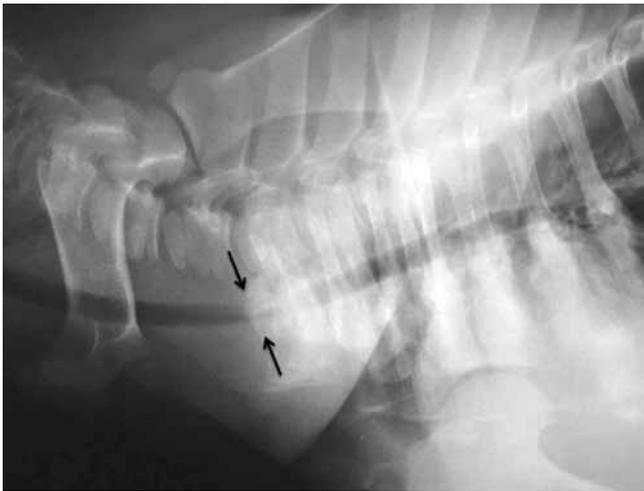


Figure 1 - The lateral thoracic radiograph area of the calf with tracheal collapse and the narrowing of the tracheal diameter at the thoracic inlet (black arrows).

tral tracheal wall. The calf showed a Class III of tracheal collapse classifications (Figure 2B) during the endoscopy⁴. The calf was discharged against medical advice because the severity of the dyspnea and a poor prognosis for improvement without surgery were excluded by the owner. Reports of tracheal collapse or stenosis in calves are infrequently and rare^{5,6}. Young calves are more affected with clinical signs that are usually first evident at several weeks of age^{7,8}. Tracheal collapse or stenosis should be suspected (based on clinical findings) because attenuation of the tracheal lumen and axity of the dorsal tracheal membrane result in varying degrees of coughing and dyspnea in calves like in other species⁵. A progressively worsening inspiratory dyspnea is good presumptive evidence for tracheal collapse in calf must be considered in differential diagnosis of bronchopneumonia, necrotic laryngitis, foreign body, abscess, actinobacillosis, hematoma and neoplasia. Calves presented for coughing unresponsive to antibiotic therapy should be evaluated for tracheal collapse, considering also that empirical therapy for pneumonia in calves with tracheal collapse may impair growth rate⁵. According to the literature, the thoracic inlet segment of the trachea is most commonly while collapse of the cervical segment of the trachea is rare in calves⁵. Most of the cases de-

scribed also concerned the thoracic trachea suggest a congenital lesion⁶. Nonspecific etiology has not been proven⁵, but cranial thoracic trauma, roping, tracheostomies and possibly congenital defects have been reported as causes in the literature⁸. However, tracheal collapse condition might be related to dystocia (especially breech presentations) or traumatic event after calving^{5,8}.

Dystocia with dorsoventral compression of the thorax and trauma after calving should be considered, though the source of damage to the anterior thorax of young calves is unknown as in this case.

In conclusion, however rare the tracheal collapse in the calf should always be considered in the differential diagnosis of diseases of respiratory system and consider diagnostic imaging as necessary to make a definitive diagnosis.

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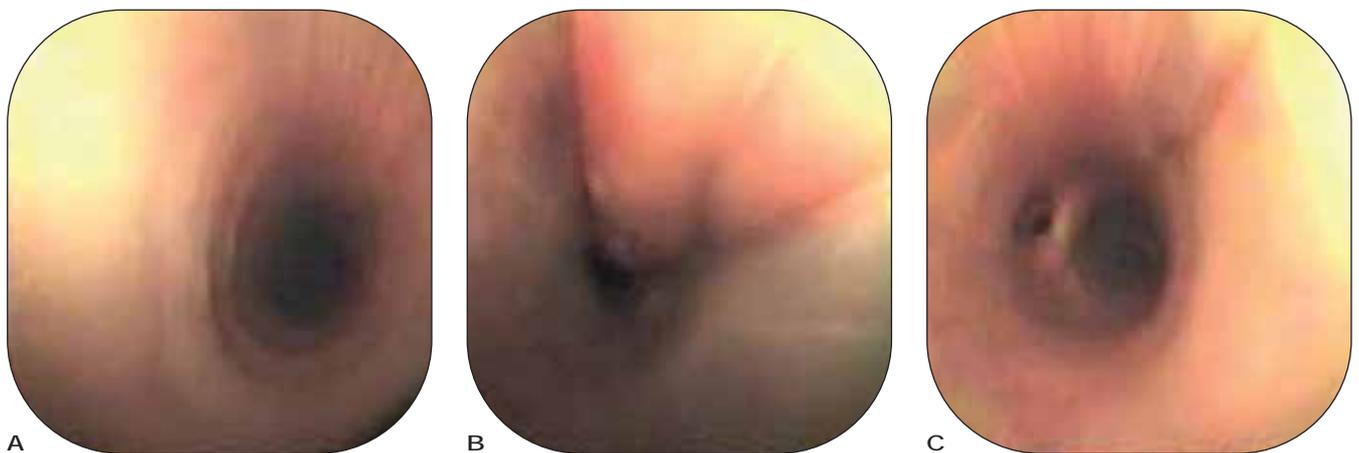


Figure 2 - A, Bronchoscopic appearance of the normal tracheal lumen before collapse; B, Bronchoscopic view of the intrathoracic tracheal collapse; C, Same airway at the level of the carina after collapse.