Peritracheal abscess associated with tracheal collapse and bilateral laryngeal paralysis in a dog

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An 8-month-old castrated Cocker Spaniel was referred to the veterinary teaching hospital because of severe dyspnea. Two weeks earlier, the dog had eaten a stereo speaker, and 3 days later, it had pyrexia (40.6°C), vomiting, and diarrhea. The dog improved after empiric treatment for gastroenteritis, but 12 days after ingesting the foreign body, it began coughing. The day before referral, the dog had dysphagia and severe dyspnea and was treated at an emergency clinic with antibiotics, corticosteroids, a diuretic, and a tranquilizer.

Physical examination at the time of referral indicated that the dog was alert, but severely dyspneic. It was panting and had rectal temperature of 39.1°C and pulse of 84 beats/min. The dog had inspiratory stridor, expiratory wheezing, and a honking-type cough, and became cyanotic when stressed. Results of CBC, serum biochemical analysis, and urinalysis were unremarkable. Radiographs of the thorax and cervical area indicated severe narrowing of the trachea immediately caudal to the thoracic inlet (Fig 1). The tracheal lumen was reduced to approximately 25% of its normal diameter for a length of 4 cm. The lungs appeared to be hyperinflated.

For evaluation of laryngeal function, light plane of anesthesia was induced by IV administration of sodium thiopental. Bilateral laryngeal paralysis was detected, and tracheal intubation was performed without difficulty. Endoscopic findings of the trachea revealed normal tracheal mucosa; however, a 4-cm segment of the intrathoracic portion of the trachea was completely collapsed beginning at the thoracic inlet. Esophagoscopy revealed normal esophageal mucosa, but there was evidence of extramural compression at the level of the thoracic inlet. Positive-pressure ventilation performed during fluoroscopy caused a 50% increase in size of the lumen of the collapsed tracheal segment.

Three days after referral, the dog was anesthetized, and median sternotomy was performed. Large lymph nodes were observed in the cranial mediastinum. Examination of impression smears of these lymph nodes indicated reactive lymph node hyperplasia and mild acute lymphadenitis. The ventral surface of the trachea at the level of the first through the third rib was covered by a mass of fibrous tissue approximately 1.5 cm wide and 4 cm long. Both recurrent laryngeal nerves were identified entering the cranial end of the fibrous mass. When the fibrous tissue was dissected from the trachea, an abscess approximately 1 cm in diameter was visualized in the ventral wall of the trachea. Four small, white structures (approximately 10 mm × 3 mm × 1 mm) were suspended in the purulent exudate of the abscess. These structures appeared to be sloughed tracheal rings. A 5-cm segment of trachea in the area of the abscess had no structural support and was easily collapsed by digital pressure. A pale yellow lesion (approximately 1 cm in diameter) was identified on the adventitial surface of the esophagus at the level of the tracheal lesion. It was suspected that a foreign body had penetrated the wall of the esophagus, and resulting contamination had caused the tracheal abscess. The recurrent laryngeal nerves were carefully dissected from the mass of fibrous...
tissue. The collapsing segment of trachea was resected, and end-to-end anastomosis was performed, using simple interrupted sutures of 3-0 polyglyactin 910 placed around the tracheal rings and in the dorsal tracheal membrane. Three tension sutures of 2-0 polypropylene were placed around the second tracheal rings cranial and caudal to the anastomosis. The thoracic cavity was irrigated, using normothermic Ringer solution, and a thoracic drainage tube was placed. Sternotomy was closed in routine manner. Cephalothin was administered IV during surgery after samples were obtained from the tracheal abscess for bacteriologic culture and antimicrobial susceptibility testing. Cephalexin was administered orally for 10 days after surgery. Aerobic and anaerobic bacteriologic culture of the abscess did not yield growth.

After surgery, dyspnea was greatly improved, but inspiratory wheeze and harsh cough were heard, both of which improved during the first week after surgery. The dog had no episodes of cyanosis after surgery. The thoracic drainage tube was removed 4 days after surgery, and the dog was released from the hospital 6 days after surgery.

The dog was reevaluated 6 weeks after surgery; activity and exercise tolerance were normal. Abnormalities were not detected during physical examination. Radiographs of the thorax and cervical area indicated slight narrowing of the tracheal lumen at the site of anastomosis (Fig 2). There also appeared to be widening of the ventral portion of the cranial mediastinum and slight increase in perihilar density. Ultrasonography of the cranial mediastinum revealed mix-textured echogenicity, with no evidence of fluid accumulation. For laryngeal examination, light-stage anesthesia was induced by IV administration of sodium thionyl. Laryngeal function appeared to be normal, with both arytenoid cartilages moving symmetrically. Results of a CBC were normal except for slight left shift (800 band cells/ml). The owners were instructed to return the dog for reevaluation of the cranial mediastinum in 6 weeks, but neglected to do so; however, 6 months after surgery, they reported that the dog was clinically normal.

Histologic evaluation of the peritracheal fibrous tissue revealed the typical pyogenic membrane and peripheral fibrosis of an abscess. Material from the center of the abscess consisted of cellular debris and cartilage fragments. Suppurative tracheitis was observed in the resected segment of trachea.

Tracheal collapse typically occurs in miniature- and toy-breed dogs and is the result of soft, weak tracheal cartilages that are unable to resist changing intraluminal pressures. The tracheal rings are hypocellular and contain less glycosaminoglycans and water than do tracheal rings of dogs without tracheal collapse.

In this dog, tracheal collapse was secondary to chondromalacia of the tracheal rings caused by the peritracheal abscess. It is possible that the rigidity of the involved segment of trachea was sufficient to prevent severe tracheal collapse until laryngeal paralysis developed. The onset of laryngeal paralysis required generation of greater negative pressure in the lumen of the trachea to overcome the obstruction at the glottis. Increased negative intraluminal pressure may have exerted sufficient force on the compromised segment of trachea to cause tracheal collapse and the resulting acute onset of the typical honking cough and severe dyspnea.

In this dog, laryngeal paralysis was attributable to entrapment of both recurrent laryngeal nerves in the fibrous tissue surrounding the peritracheal abscess. In horses, laryngeal paralysis has been reported secondary to a paralaryngeal abscess and abscess of the cranial mediastinal lymph nodes. In both horses, laryngeal paralysis was presumed to be caused by involvement of the recurrent laryngeal nerves in the abscess. Laryngeal hemiplegia persisted in both horses after treatment of the abscess. In this dog, it was possible to identify both recurrent laryngeal nerves and to free them from the fibrous tissue surrounding the abscess. Immediate laryngeal surgery was not performed because the likely cause of the laryngeal paralysis was identified and corrected. It was hoped that with time, laryngeal function would return. If integrity of the recurrent laryngeal nerves had not been maintained during surgery or if laryngeal function had not returned within a few months of surgery, definitive laryngeal surgery such as partial arytenoidectomy, lateralization of the arytenoid cartilages, or castellated laryngofissure would have been recommended.

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*aVicryl, Ethicon Inc, Somerville, NJ.

*Prolene, Ethicon Inc, Somerville, NJ.

*Kellin, Eli Lilly and Co, Indianapolis, Ind.

*Deflex, Distco Products Co, Eli Lilly Industries Inc, Carolina, Puerto Rico.
The peritracheal abscess in this dog was most likely secondary to esophageal perforation and resulting contamination of the mediastinum. Esophageal perforation most likely occurred when the dog ingested the stereo speaker. The fever 3 days later was compatible with inflammatory reaction secondary to mediastinal contamination. Antibiotic administration may have eliminated any bacterial component; however, the inflammatory reaction persisted and resulted in recurrent laryngeal nerve entrapment and tracheal chondromalacia.

Esophageal foreign bodies commonly result in complications. A retrospective study of 66 cases of esophageal foreign bodies reported a complication rate of 57.6%. The most common complications include esophageal perforation, mediastinitis, pleuritis, pyothorax, and mucosal lacerations.6,7 Other complications that have been reported include perforation of the trachea8 and tracheoesophageal fistula.9

References

Correction: Viewpoints on dairy herd fertility

In the Special Commentary “Viewpoints on dairy herd fertility” (JAVMA, Mar 1, 1990, pp 726–727), at the top of the second column on page 726, in the sentence beginning “Low conception rate is . . . .,” the phrase “but may be caused by a combination of factors” should read “is most likely caused by a coincidental (or random) temporary increase in the very same factors that ordinarily cause 40% not to conceive.” In the bottom line of the second column on that page, item (5) should read “How many days are allowed for cows to be determined to be in estrus and become pregnant?” In the footnote to the article, the title of the computer program should be “The Effect of Calving Interval and Culling Practices on Milk Production.” The JAVMA regrets the errors.