A 10-year-old 385-kg (847-lb) Longhorn cow pregnant with a valuable Jersey embryo transfer fetus was brought to the Oklahoma State University veterinary teaching hospital for evaluation because of inspiratory dyspnea of 6 weeks’ duration. Despite maintaining a good appetite, the cow had lost body condition. The cow was maintained on Bermuda grass pasture, was fed supplemental alfalfa hay, and had been vaccinated and dewormed 6 months prior to examination. Other medications had not been administered.

Physical abnormalities at the time of initial examination included mild tachypnea (40 breaths/min), orthopnea, inspiratory dyspnea, and stridor. Mucous membranes were pink and moist, and capillary refill time was < 2 seconds. A mucoid nasal discharge was evident in the right nostril. Stertorous inspiratory sounds were heard during auscultation of the upper airway, especially during auscultation in the laryngeal region. Thoracic auscultation revealed normal lung sounds bilaterally and referred laryngeal noises. Rectal temperature was 38.7°C (101.7°F), and heart rate was 80 beats/min. No halitosis was detected. The cow was thin (body condition score of 4 on a scale from 1 to 9), and transrectal palpation confirmed that the cow was at approximately 3 months of gestation.

A large pedunculated soft tissue mass was palpated in the nasopharynx. Its apex appeared to occlude the tracheal opening, but oral manipulations quickly induced signs of respiratory distress, precluding further examination of the oral cavity. Endoscopy of the nasopharynx revealed a well-vascularized, irregularly shaped, soft tissue mass that moved ventrally during inspiration and dorsally during expiration. The mass was located in the midpharyngeal region, dorsal to the tracheal opening and caudodorsal to the soft palate, and extended ventrally and rostrally in the nasopharynx (Figure 1). The trachea, arytenoid cartilages, and epiglottis appeared grossly normal. A fine-needle aspirate of the mass was obtained with a 16-gauge needle attached to polyethylene tubing (1.57-mm internal diameter) passed through the endoscope. Results of cytologic examination of the aspirate following Wright-Giemsa staining were indicative of suppurative inflammation and squamous cell dysplasia. Three biopsy specimens of the mass were obtained transendoscopically with biopsy forceps. Microscopic examination of the biopsy specimens revealed a large number of neutrophils and mild fibrosis suggestive of an inflammatory process. Neoplastic cells were not observed; however,
neoplasia could not be excluded because biopsy specimens were small. A bacterial granuloma was suspected on the basis of anatomic location and results of ancillary tests.

To alleviate clinical signs, obtain a definitive diagnosis, and formulate a prognosis, surgical removal of the mass was recommended. Hematocrit, plasma protein concentration, and BUN concentration were within reference limits. Water was withheld for 12 hours and feed was withheld for 36 hours prior to surgery, and treatment with ceftriaxone (2 mg/kg [0.9 mg/lb], IM, q 24 h) and flunixin meglumine (1.1 mg/kg [0.5 mg/lb], IV, q 12 h) was begun before surgery. The cow was premedicated with acepromazine (0.04 mg/kg [0.018 mg/lb], IV) and butorphanol (0.03 mg/kg [0.014 mg/lb], IV), and a tracheostomy was performed to allow transtracheal intubation and facilitate surgical manipulations within the oral cavity. Anesthesia was induced with diazepam (0.13 mg/kg [0.06 mg/lb], IV) and ketamine (0.2 mg/kg [0.09 mg/lb], IV) and maintained with isoflurane.

The cow was positioned in sternal recumbency with the head tied forward and an oral speculum inserted. An endoscope was used to examine the mass and ensure correct positioning of the chain écra-seur. The rostral aspect of the mass was manually displaced ventrally, below the soft palate, and the surgeon’s right hand was passed through the chain loop to grasp the mass. The chain was then slipped over the mass in a rostral-to-caudal manner, and the surgeon’s hand was withdrawn. The chain was gradually tightened around the pedicle of the mass over a period of several minutes. The mass was then severed at its attachment and removed from the oral cavity. Histologic examination did not reveal any obvious remnants or excessive bleeding. Histologic examination of portions of the mass revealed chronic severe pyogranulomatous inflammation with intralesional sulfur granules (Figure 2) that contained gram-negative coccobacilli. Findings were consistent with infection with a gram-negative bacterium such as Actinobacillus lignieresii.

The cow recovered from general anesthesia without complications. After extubation, a self-retaining tracheostomy tube (14-mm internal diameter) was left in place to prevent respiratory distress associated with postoperative pharyngeal swelling. The tracheostomy tube was cleaned daily. Within 12 hours after recovering from anesthesia, the cow was observed eating roughage normally. Two days after surgery, endoscopic examination of the pharynx revealed no signs of inflammation. The tracheostomy tube was removed, and the site was left to heal by second intention. Flunixin was administered for 3 days after surgery, and ceftriaxone was administered for 7 days after surgery. The cow was discharged 8 days after surgery. The owner reported that the cow was doing well and had gained weight 1, 2, 5, and 8 months after discharge from the hospital. The cow carried the pregnancy to term and delivered a live heifer calf. No signs of respiratory distress have been reported since surgery.

Discussion

Reported causes for orthopnea and inspiratory dyspnea in young adult and mature cattle include...
pharyngeal and retropharyngeal abscesses, laryngeal granuloma or foreign body, necrotic laryngitis and associated chondritis, trauma secondary to improper oral administration of medications, and lymphosarcoma involving the retropharyngeal lymph nodes. Ancillary tests provided a presumptive diagnosis in this case; however, a final diagnosis was made only following histologic examination of the granuloma after surgical removal. Although bacterial culture was not done, the causative organism was suspected to be from the genus *Actinobacillus* on the basis of Gram staining characteristics, size, shape, and characteristic histologic abnormalities. Other bacteria are capable of causing pyogranulomatous inflammation with sulfur granules, including *Actinomyces bovis*, *Staphylococcus aureus*, and *Arcanobacterium pyogenes*. However, these organisms are gram positive and are distinct cocci or bacilli.

*Actinobacillus lignieresii* is a gram-negative organism commonly found in the alimentary tract of ruminants and is recognized as the cause of wooden tongue. Atypical infection involving the soft tissues and regional lymph nodes of the head (eg, face, eyelid, muzzle, nostril, or lip) and neck has been reported, along with cutaneous infection.

Actinobacillosis in cattle is typically treated with sodium iodide or oxytetracycline, although 1 report of cattle with atypical actinobacillosis described treatment with a variety of antimicrobials, including penicillin and streptomycin. In the cow described in the present report, ceftiofur was administered prophylactically during the perioperative period because of concerns about postoperative pharyngeal infection and possible aspiration pneumonia associated with the tracheostomy. Sodium iodide was not administered because of its potential abortifacient effects in pregnant cows.

Surgical treatment of atypical actinobacillosis depends on the number, anatomic location, and accessibility of associated granulomas. Intranasal and eyelid granulomas have been successfully treated with a combination of debulking and systemic administration of sodium iodide, and in 1 report, a laryngeal granuloma was removed with an 18-gauge stainless-steel wire introduced through a metal catheter. In the present case, a chain écraseur was used to crush the tissues prior to removal of the granuloma in an effort to limit blood loss following surgery. Adequate placement of the écraseur was challenging owing to space limitations in the oral cavity. Positioning of the animal, placement of an oral speculum, and transtracheal intubation facilitated surgical removal. The long-term prognosis for the cow was considered excellent.

Findings in the present report suggested that pharyngeal granuloma resulting from actinobacillosis should be included in the differential diagnoses when examining mature cattle with inspiratory dyspnea and stridor. Although a presumptive diagnosis can be made with endoscopic examination of the nasopharynx, a definitive diagnosis requires histologic examination. The surgical approach used in the present report was not associated with any clinically important complications.

### References


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