

## Oral and Laryngeal Necrobacillosis (Calf diphtheria, Necrotic Laryngitis in Cattle)

Necrotic laryngitis is an acute or chronic bacterial infection of the laryngeal mucosa and cartilage of young cattle, characterized by fever, cough, inspiratory dyspnea, and stridor.

- It occurs primarily in feedlot cattle **3–18 months** of age; cases have been documented in calves as young as **5 weeks** and in cattle as old as **24 months**.

### Etiology:

*Fusobacterium necrophorum*, a G-, non-sporeforming anaerobe, is a normal inhabitant of the alimentary, respiratory, and genital tract of animals. It is an opportunistic pathogen that causes several necrotic conditions in animals including necrotic laryngitis.

### Transmission and Epidemiology:

- Necrotic laryngitis is most common where cattle are closely confined under **unsanitary conditions** or in **feedlots**.
- The prevalence in feedlot calves is estimated to be 1%–2%.
- Most cases are sporadic and occur year round, but disease peaks in **fall** and **winter**.
- Mixed upper respiratory tract infections (caused by IBR virus and parainfluenza-3 virus; *Mycoplasma* spp; and bacteria, including *Pasteurella* and *Haemophilus*), and the coughing and swallowing associated with these infections, may predispose feedlot cattle to develop laryngeal contact **ulcers**.
- These ulcers on the vocal processes and medial angles of arytenoid cartilages are thought to provide a portal of entry for *F. necrophorum*.

### Pathogenesis:

- *F. necrophorum* causes inflammation, necrosis, and edema in the laryngeal mucosa, causing a narrowing of the rima glottides, inspiratory dyspnea and stridor.
- If infection extends into the laryngeal cartilage, laryngeal chondritis develops, which may lead to a chronically deformed larynx.
- Pharyngeal invasion by the organism causes discomfort characterized by painful swallowing motions.
- Systemic signs of illness have been attributed to the bacterial exotoxin .

### Clinical Findings:

1. Initially, a moist, painful cough is noticed.
2. Severe inspiratory dyspnea, characterized by open-mouth breathing with the head and neck extended, and loud inspiratory stridor are common findings.

3. Ptyalism; frequent, painful swallowing motions; bilateral, purulent nasal discharge; and a fetid odor to the breath may also be present.
4. Systemic signs may include fever (41.1°C), anorexia, depression, and hyperemia of the mucous membranes.
5. Untreated calves die in 2–7 days from toxemia and upper airway obstruction.

### **Lesions:**

Acute lesions are characterized by edema and hyperemia surrounding a necrotic ulcer in the laryngeal mucosa; lesions may spread along the vocal folds and processes to involve the cricoarytenoideus dorsalis muscle.

In chronic cases, lesions consist of necrotic cartilage associated with a draining tract surrounded by granulation tissue.

### **Diagnosis:**

- ✓ Clinical signs are usually sufficient to establish a diagnosis. However, the larynx should be visually inspected to confirm a diagnosis.
- ✓ This can be accomplished by means of an orally inserted speculum, laryngoscopy, endoscopy, or radiography.
- ✓ A tracheostomy should be performed before laryngoscopic or endoscopic examination in cattle with severe inspiratory dyspnea.

### **Differential diagnosis:** include

1. Pharyngeal trauma
2. Severe viral laryngitis (eg, infectious bovine rhinotracheitis)
3. Actinobacillosis
4. Laryngeal edema, abscesses, trauma, paralysis, or tumors.

### **Treatment:**

1. Oxytetracycline (20 mg/kg of long-acting, IM, every 72 hr) or procaine penicillin (22,000 U/kg, IM, bid) are the antimicrobials of choice.
2. NSAIDs (Aspirin, 100 mg/kg, PO, bid; or Flunixin, 1.1–2.2 mg/kg, IV, once daily or divided bid) are used to decrease the fever and laryngeal inflammation and edema.
3. A single dose of dexamethasone (0.2–0.5 mg/kg, IV or IM) may be used to decrease laryngeal edema in animals with severe respiratory distress.
4. A tracheostomy is indicated in cattle with severe inspiratory dyspnea.
5. Intravenous fluids may be required in dehydrated animals.
6. The prognosis is good for early cases treated aggressively; chronic cases require surgery under general anesthesia to remove necrotic or granulation tissue and to drain laryngeal abscesses.