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Actinobacillosis in a cross-bred heifer: A case report

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Abstract

Actinobacillosis is an infectious, chronic, generally non-fatal disease caused by *Actinobacillus lignieresii*. The causative agent is a commensal organism in the mouth and rumen of cattle and sheep. Infection probably occurs endogenously as a result of small wounds. The classical form of the disease in cattle results in swelling and hardening of tongue, which is often, referred as wooden tongue. Local infection by the organism results in an acute inflammatory reaction and the subsequent development of granulomatous lesions in which necrosis and suppuration develop, often with discharge of pus. Infection spreads to the regional lymph nodes. Lingual involvement in cattle interferes with mastication due to acute inflammation in early stage and distortion of the tongue at a later stage. Younger animals ranging from two to five years of age are more susceptible.

Keywords: *Actinobacillus lignieresii*, granulomatous lesions, suppuration, wooden tongue, commensal

Introduction

Brown *et al.* 2007 [2] reported that Actinobacillosis due to *Actinobacillus lignieresii* has been observed in domestic animals including cattle, sheep, goats, buffalo, horses and dogs. Sharma *et al.* 2010 explained that it is a chronic disease affecting soft tissue of facial region and lymph nodes. The classical form of the disease in cattle results in swelling and hardening of tongue which is often referred as wooden tongue. Smith, 2009 [11] found that the causative agent is a gram-negative, aerobic rod and a normal inhabitant of the gastrointestinal tract of ruminants. Songer and Post, 2005 [12] revealed that the etiologic agent is found normally in the oropharynx and rumen of cattle and sheep. The organism is an opportunistic pathogen and it causes chronic pyogranulomatous lesions of the soft tissues of head and neck regions in cows, buffalo, sheep, goats, and horses. Melendez *et al.* 1999 [5] demonstrated that lesions appear as nodules, multiple abscesses, ulcers or draining fistulae and characterized by the presence of granulomas with pus-containing small, hard yellow to white granules. Rycroft and Garside, 2000 [10] revealed that in cattle, the disease typically involves the formation of pyogranulomas in the oral cavity, tongue or forestomachs with subsequent spread to regional lymph nodes. The diagnosis of wooden tongue is chiefly based upon the isolation and identification of the causative organism.

Case history and clinical observations

A two year old heifer was referred to the Department of Veterinary Clinical Medicine, College of Veterinary and Animal Science, Bikaner with history of off-feed for 2-3 days, difficulty of mastication due to involvement of tongue. On clinical examination the patient had a bilateral swelling of the face, abscess at ventral part of mandible region and dyspnea. The animal was also presented with slight nasal discharge and slightly swollen sub-mandibular lymph nodes. The heifer was earlier treated at local village hospital but did not show any improvement. The heifer was further subjected to hematological and microbiological procedures. Hematology was within normal ranges except elevation of the neutrophils. Microbiological examination (Gram staining) of samples taken was found positive for *Actinobacillus lignieresii* along with *Staphylococcus aureus* which was also found. Thus *Actinobacillus lignieresii* was confirmed as the causal agent on the basis of both clinical and microbiological examination.



Fig 1: Showing abscess at ventral part of mandible region.



Fig 2: Showing protrusion of tongue

Therapeutic management and discussion

The heifer was treated with i/m injection of Dicrysticin-S 2.5 gm (Each vial contains Procaine Penicillin G 1500000 I.U., Penicillin G Sodium 500000 I.U., and Streptomycin sulphate 2.5gm) daily for 5 days, Inj. Melonex @ 0.5 mg/kg i/m, along with Potassium iodide 10 gm orally daily for 8 days. Besides local dressing of the abscesses was required daily. Supportive treatment given as dextrose solution 2 litre/day, liver extract and vitamin-B complex. Full thickness incision biopsies of the skin were taken for histopathological examination which showed a thickened epidermis with scarring of the dermis and multiple abscessations in the deep dermis. Within the abscesses there were distinct rosettes of slender clubs with Gram-negative rod-shaped organisms at their centre. Bacteriological cultures of secretions from the skin lesions were found positive for *Actinobacillus lignieresii* and *Staphylococcus aureus*. What role *S. aureus* played in this case remains unclear, although the histopathological appearance of the lesions was highly characteristic of those associated with *A. lignieresii* infection. However, given that *S. aureus* results in pyogranuloma formation (botryomycosis) following wound infection in horses and pigs (McGavin 1995) [4] its additional presence may have increased the severity of the lesions in this case. Many treatments have been tried for actinobacillosis including surgical debulking followed by post-operative therapy with intramuscular penicillin/streptomycin and intravenous sodium iodide (Arora *et al.*, 1980) [1], streptomycin/ dihydrostreptomycin (Prescott

and Baggot, 1993) [7] and other antimicrobials including tetracycline's and sulphonamides (Prescott and Baggot, 1993, Milne *et al.*, 2001) [7, 6]. Bovine actinobacillosis has usually been identified as a sporadic, insidiously developing granulomatous condition (Smith, 2009) [11]. Infections and pathological developments are the product of tissue trauma, lesions or prolonged irritation. It is believed that the causal agent penetrates the tissues of the mouth through lesions caused by foods or foreign objects. The organism gains entry to deep tissues via traumatic erosions, ulcers and penetrating lesion induced by hard fibrous hays, straw and plant awns (Radostits *et al.*, 2007, Brown *et al.*, 2007, Smith, 2009) [8, 9, 2, 11]. Young cattle in particular, are susceptible following subcutaneous inoculation and lesions can develop in a number of days (Rebhun, 1988; Rycroft and Garside, 2000) [3, 10].

Conclusion

The present study revealed *Actinobacillus lignieresii* as the causative agent of the disease. Affected cattle with draining pyogranulomas contaminate the environment, favoring disease transmission, and should be treated with potassium iodide and antibiotics and isolated from the herd in order to control the disease.

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