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Actinomycosis in a Holstein heifer: Diagnosis, treatment and management

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Abstract

A two years old Holstein heifer was presented with the history of inappetence, salivation and difficulty of mastication due to unilateral mandibular swelling. On clinical examination the patient had hard, painless, bony immovable mass on the right mandible without any opening or discharge. Paracentesis of the mass was done aseptically and revealed free flowing, non-odorous, thin pus mixed with blood. Blood examination showed neutrophilic leukocytosis. Microbiological examination (Gram staining) of sample taken from the mass was found positive for *Actinomyces bovis*. On the basis of history, clinical findings and laboratory examination the case was diagnosed as Actinomycosis or lumpy jaw. The Heifer was treated with parenteral administration of Penicillin + Streptomycin and Sodium Iodide along with oral administration of Potassium Iodide with complete recovery in a month after initiation of treatment.

Keywords: Actinomycosis, lumpy jaw, Actinomyces bovis, heifer, treatment.

1. Introduction

Bovine Actinomycosis or lumpy jaw is manifested by chronic osteomyelitis and rarefication of the bones particularly of the mandible and maxilla leading to serious impairment in feeding. It is a sporadic disease, common in cattle but occasional also occurs in pigs, horses, goats, dogs and humans ^[1]. Actinomycosis is caused by *Actinomyces bovis*, a gram-positive, anaerobic, non-capsulated, coccobacilli, filamentous bacterium that is a normal inhabitant of the ruminants' mouth and infection usually occurs due to wounds in buccal mucosa by sharp feed materials or foreign body ^[2]. The basic lesion is represented by granulation tissue having small abscesses, sulphur granules and occasionally draining sinus tracts. Involvement of adjacent bone frequently results in facial distortion, loose teeth and dyspnea due to swelling in nasal cavity. It is an important cause of economic losses in livestock because of its widespread occurrence and poor response to the routine clinical treatment ^[3]. The present clinical report describes successful therapeutic management of Actinomycosis in a Holstein heifer.

2. History and Diagnosis

A two years old Holstein heifer was presented to Teaching Veterinary Clinical Complex, Khalsa College of Veterinary and Animal Sciences, Amritsar with the history of inappetence for 5 days, drooling of saliva, difficulty of mastication due to unilateral mandibular swelling. On clinical examination the patient had hard, painless, bony immovable mass on the right mandible without any opening or discharge (Fig. 1). The size of the mass was 15×6×11 cm in diameters. History indicated that the owner had increased the wheat straw (dry fodder) in diet for last one month and condition began after 10 days, previously as a small, walnut-size swelling that gradually enlarged over this period. Oral cavity examination revealed negative for any foreign object or dry feed jammed between the teeth and cheeks. The vital parameters like rectal temperature, pulse and respiratory rates were 103.2°F, 82/min. and 35/min. respectively. The heifer was earlier treated at local village hospital but did not show any improvement. The animal was examined as suspected cases of actinomycosis needing further investigation. Paracentesis of the mass was done aseptically and revealed free flowing, nonodorous, thin pus mixed with blood and collected in a Petri dish (Fig. 2). The sample was immediately transferred into sterilized tubes for investigation of the causative organism following standard procedures. Blood examination showed neutrophilic leukocytosis (Hb- 9.2 g/dl, TLC-13,240/µl, N-72/µl, L-24/µl, E-4/µl) and adequate platelets count. Microbiological examination (Gram staining) of sample taken was found positive for Actinomyces bovis. The characteristics gram-positive, coccoid filaments with irregular clubs surfaces were observed

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under the microscope. The antibiotic sensitivity test revealed that organisms were sensitive to Streptomycin, Penicillin, Ampicillin and Tetracycline. On the basis of history, clinical findings and laboratory examination the case was diagnosed as Actinomycosis.

3. Treatment and Discussion

The heifer was treated with 10% solution of Sodium Iodide @70 mg/kg bwt. was dissolved in 300 ml normal saline administered slowly IV along with Inj. Dicrysticin-DS (Procaine Penicillin G- 30,00,000 IU, Penicillin G Sodium-10,00,000 IU and Streptomycin Sulphate- 5 gm) @5 gm IM OD ×7 days, Inj. Maxxtol XP (Tolfenamic acid 8%) Single shot @2mg/kg bwt. IM repeated after 48 hours, Inj. Tribivet (Vitamin B_1 , B_6 and B_{12}) @10ml IM OD $\times 5$ days. The bony mass was drained and flushed with a 2% solution of povidone-iodine. Oral treatment with Potassium Iodide @10 gm daily for 10 days was done till symptoms of iodism like salivation, lacrimation, diarrhea, inappetence and coughing developed. Subsequently, reduction in mandibular swelling was observed from 10th day of treatment (Fig. 3) but not recovered completely. The owner was advised to continue oral treatment with Potassium Iodide @10 gm daily for next 10 days until iodism occur, along with local dressing of wound with povidone-iodine ointment daily till complete cure. After one month owner informed that the heifer has completely recovered and thriving well.

Observed lesion in this study had hard, immovable, painless, bony swelling on the mandible which was similar with the reported of Van Metre *et al.*^[4]. Jones and Smith^[2]. Constable et al.^[1]. At initial stage of disease, the lesion had no fistulous tract (non-draining) as observed in this case, which was supported by Jones and Smith ^[2]. Effective treatment of actinomycosis in animal with oral administration of potassium iodide in combination with Penicillin and Streptomycin has been reported by Pal et al. ^[5], Vaja et al. ^[6] and Patel et al. ^[7]. Intravenous administered of Sodium Iodide have also been found effective ^[1, 2, 8]. Abrasions or wounds in the oral cavity, caused by dry and coarse feeds fed to the animal are believed to be the primary cause of entry of organism into the animal as documented by Jones and Smith [2]. To prevent the occurrence of this disease, animals should be fed with smooth and water soaked straws to avoid damage to the buccal mucosa. Affected animals should be kept in separate paddocks and should be fed separately. Also, the affected animals should not be allowed to graze in pastures along with healthy cattle to prevent the contamination of grass, water, bedding and utensils by the animals. This will also help in prevention of infection to other healthy animals.



Fig 1: Hard, painless, bony immovable mass on the right mandible



Fig 2: Paracentesis of the mass revealed free flowing, non-odorous, thin pus mixed with blood



Fig 3: Reduction in mandibular swelling during treatment

4. Conclusion

The conventional therapy with sodium or potassium iodide has good response, but sometimes it may cause iodism. In the present case, Actinomycosis in a Holstein heifer treated with parenteral administration of Penicillin + Streptomycin and Sodium Iodide along with oral administration of potassium iodide has showed good result without any complication.

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