Careful surgery, management and treatment of bovine calf actinomycosis (lumpy jaw)

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ABSTRACT

Actinomycosis (lumpy jaw) is a chronic disease characterized by abscess formation of tissue fibrosis, draining sinuses caused by non spore forming anaerobic bacterial species of Actinomyces bovis. A 2-month-old crossbred Jersey calf having 60 kg body weight with a clinical history of proliferative overgrowth at the intermandibular region was presented in a veterinary clinic. There was partial reduction in appetite, granular mandibular swelling, mild dyspnoea, pyrexia and painful mastications. On clinical examination, mandibular swelling revealed sticky, honey like fluid containing minute, hard and yellow white granules. After the tentative clinical diagnosis the excessive growth was removed surgically. For treatment, the wound was washed with povidone and Penicillin powder was applied for 4-6 days. Also Amoxi-vet LA @0.04 ml/kg b.wt, Nefalor @0.06 ml/kg b.wt and Vetafenic Plus @0.05 ml/kg b.wt by I/M were injected for two months. However, the recovery of wound was significantly increased by this treatment.

Key words: Actinomycosis, diagnosis, lumpy jaw, treatment, management.

INTRODUCTION

Actinomycosis or lumpy jaw is a significant cause of production losses (milk and meat) and economic losses of all livestock products because the response of this disease is poor response to the routine clinical care and treatment (Blowey and Weaver, 2011; Fagan et al., 2005; Boulton et al., 2013). Actinomycosis disease is common in human and animal. Both Actinomycosis causes swelling of mouth muscle spasm and tissue or locked jaw then mouth cannot open because the all neck region is swelled and injured (Boulton et al., 2013). This disease most commonly caused by the head region bones osteomyelitis and dental alveoli which results in loose teeth (Masand et al., 2014). There are so many different types of Actinomycosis for example, Oral cervico facial actinomycosis involve in neck and face, Thoracic actinomycosis, is mostly common in a thoracic activity e.g. lung, chast, etc, Abdominal actinomycosis, commonly involves intestine and colon etc. Pelvic actinomycosis, is mostly caused in female genital tract (Blood and Studdert, 1988, Nikolaitchouk, 2009).

Actinomycosis is not contagious and zoonotic disease. The Actinomycosis bacteria mostly found in oral cavity, nasopharyngeal membranes, gastrointestinal tract and in humans are also found in the female urinary tract (Blood and Studdert, 1988; Vos, 2007). Actinomycosis is a rare type of infections bacterial disease, that caused by Actinomyces species such as Actinomyces israelii or A. gerencseriae (Oostman and Smego Jr, 2005; Sudhakar and Ross, 2004). It can also be caused by Propionibacterium propionicus, and the condition is likely to be polymicrobial aerobic and anaerobic infection(Baron and Bowden, 1996; Wong et al, 2011). Actinomyces species may form endospores and, individual bacteria are rod- shaped.
Actinomyces colonies form fungus-like branched networks of hyphae (Cecil et al., 2012, Boulton et al., 2013). The aspect of these colonies initially led to the incorrect assumption that the organism was a fungus and to the name “Actinomyces” or ray fungus (Praveen et al., 2013; Britton et al., 2011). Actinomyces species are normally present in the gums and are the most common cause of infection in dental procedures and oral abscesses. Many Actinomyces species are opportunistic pathogens of humans and other mammals, particularly in the oral cavity (Madigan, 2005). The purpose of this report is to evaluate the healing time of wound and to determine the result of drugs used in the case of actinomycosis.

MATERIALS AND METHODS

Clinical history

A two month crossbred jersey calf of about 60 kg body weights was presented with face swelling complaint and the owner was providing milk, concentrate and cotton seed cake in diets. The owner comments when we wake up early in the morning and the face swelling of calf becomes enlarge very quickly and increased within 48 h due to which calf becomes unable to eat and drink and swelled region is naturally ruptured (Figure 1AB).

Clinical examination

Clinically we observed that all the head region is well swelled on the lumpy jaw with high temperature 100.4°F (38°C), reddish skin color, mouth cannot open, nasal discharge, general body weakness, weight loss, poor appetite, difficult breathing, dry coughing. Figure 1AB shows that the naturally swelled region was ruptured after 12 h and having an appearance of yellowish sulphur like granules around optical region (Blood and Studdert, 1988). The diagnosis was done on the basis of clinical signs and symptoms. Afterwards we recommended surgery.

Surgical intervention and treatment

All the surgically instruments were sterilized. After that the whole swelling areas was locally anesthetized by the 2% xylocaine hydrochloride. All the dead tissues were removed from the optical region (Figure 2A1 and 2A3). Afterwards we cleaned the surgical area with help of Anti-septic (Povidone) solution by applying the cotton swabs. Furthermore, Penicillin powder (40 lac, Star company Pvt. Ltd. Pakistan) was also applied on the surgical wound (Leaper et al., 2004) as show in Figure 2B1 and 2B3. Moreover, the surgery process was completed then we applied the cheesecloth bandage for a protection from flies attack. Then we applied available medicines like, 1) injection of Amoxi-vet (Antibiotic) each consist of Amoxycillin 150 mg/ml, field veterinarians dose at rate of 0.04 ml/kg body weight (BW) Manufactured by ®ICI. 2) Injection of Nefalor (Antibiotic) each consist of Florphenacol 300 mg/ml field practitioner dose at the rate of 0.06ml/kg BW manufactured by ®Nawan. 3) Injection of Vetafenac Plus (anti-rheumatic and ante-inflammatory) each consists of Meloxicam 7.5 mg/ml field practitioner dose at the rate of 0.05/kg Manufactured by ®SJG. These medicines were repeated after every 48 h for the time period of two months for getting desirable and successful result.

RESULTS AND DISCUSSION

By applying the proper treatment and management, the
Figure 2. During surgery. Figure 2A1 and 2A3 show dead tissue during the surgery and figure 2A2 and 2A4 show yellowish sulphur granules around optical region during surgery (DT, dead tissue; YSG, yellowish sulphur granules).

Figure 2B. During surgery. Figure 2B1 and 2B2 show wound and Penicillin 40 lac powder applying after the surgery (W, wound; P, Penicillin 40 lac).

wound was healing gradually and successfully. After two month the wound healed completely and recovered (Figure 3A and 3B). Thus, this procedure will hopefully be a better option to the field veterinarians for the effective treatment of bovine actinomycosis disease.

Until now, no previous reports are available on the quick recovery of actinomycosis by applying any treatments but we have found this tremendous achievement within two months by applying povidone iodine and Penicillin powder directly on the affected area after surgical intervention, and injecting of Amoxi-vet LA containing Amoxycillin@ 0.04 ml/kg b.wt, Nefalor containing Florphenacol@0.06 ml/kg b.wt and Vetafenic Plus containing Meloxicam@0.05 ml/kg b.wt by intramuscular route. Evidence indicated that actinomycosis is a mandible or maxilla diseases of bovine caused by the gram positive bacteria. This disease affects many animals, such as cattle, horses, wild ruminants, small carnivores, sheep goats, monkeys, rabbits, birds and also human beings (Seifi et al., 2003; Militerno, 2008). There are no commercially available vaccines and anti-serum for a prevention of actinomycosis. Actinomycosis treatment recovery usually required high antibiotics e.g. Gentamycin, Tetracycline, Penicillin etc, and surgically removal of infected tissue, then after six months wound is recovered.
Figure 3. Three months after the surgery. Figure 3A show wound swelling and figure 3B show recovery of swelling and wound healing after three months (WS, wound swelling; WH, wound healing).

(Cecil et al., 2012). The recovery of this disease is very slow, (Mohamed et al., 2011) found recovery of Actinomycosis within four months after applied these medicine such as antibiotic (10 mg/kg I/M, oxytetracyclin, Terramycin LA®, Pfizer), a non-steroidal anti-inflammatory drug (2.2 mg/kg I/V, flunixin meglumine, Finadyne®, Schering-Plough Animal Health) and 10% glucose therapy.

Similarly, Cecil et al. (2012) found recovery after six months by surgical intervention and heavy doses of antibiotic therapy e.g. Gentamycine, Tetracycline, Penicillin etc.

Furthermore, Wong et al. (2011) found recovery of Actinomycosis within 6-12 months after the application of surgery and high dose medicine (amoxicillin, penicillin G, ceftriaxone, etc) through intravenous route, followed by oral penicillin group. Previous report demonstrated that Vos (2007) have not found any satisfactory recovery report of actinomycosis in equine after long therapy. Acevedo et al. (2008) reported that 37 years-old man affected with actinomycosis was completely recovered within eight months by injecting penicillin intravenously for one month and amoxicillin basis per oral for 12 months.

Similarly, Sudhakar and Ross (2004) also found good recovery results of actinomycosis in human two types of treatment stages the first one penicillin G (18-24 million IU/day) used intravenously for 2-3 weeks and the second one is application of medicine (amoxicillin tablet) orally for a period of 6 months.

Furthermore, Agarwal and Chandra (2013) reported that for better recovery of Actinomycosis disease (Lumpy Jaw) the abscess was washed with metronidazole & povidone iodine containing Dress solution and gauze of tincture iodine was inserted regularly for three days to destroy pyogenic membrane. Also Amoxycillin and Cloxacilline containing Intamox®, 15 mg/kg b.wt and Melonex® 0.2 mg/kg b.wt by Intramuscular route were injected for 7 days. By this treatment the swelling was suppressed gradually.

Conclusion

For the better recovery of Actinomycosis disease, we recommended surgical intervention to remove the dead tissues and regularly washed with povidone and dusting of Penicillin powder. In conjunction of Amoxycillin and Cloxacilline containing Amoxi-vet LA @0.04 ml/kg b.wt, Nefalo @0.06 ml/kg b.wt and Meloxicam containing Vetafenic Plus @0.183 ml/kg b.wt were injected by intramuscular route for two months.

Competing interest

The authors confirm that there are no competing interests.

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