Actinomycosis (Lumpy Jaw) in Capra Hircus Buck: A Case Report

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Abstract
Actinomycosis is an emerging and unanticipated infectious non-contagious disease caused by Actinomyces species affecting both humans and domesticated animals. The bacterium is opportunistic but harmless commensals of oropharynx and causes typical mandibular osteomyelitis due to which the disease is also called as ‘lumpy jaw’. Different treatment protocols adopted to cure the disease have varying degree of success and time length. In this short communication, a case of actinomycosis in Capra hircus (buck) has been diagnosed and response to antibacterial therapy (potassium iodide) has been documented. It was found that potassium iodide at the rate of 70 mg/kg body weight per oral is highly efficacious for rapid recovery from the illness as compared to already evaluated antibiotics.

Keywords
Actinomycosis; Lumpy jaw; Goat; Potassium iodide

Background
Actinomycosis is an infectious non-contagious disease caused by Actinomyces species which are opportunistic but harmless commensals of oropharynx, lower gastrointestinal system and female reproductive tract of small and large ruminants (Moniruddin et al., 2010). The organism belongs to family Actinomycetaceae. To date a total of 42 different clinically important species of the microbe have been identified. Etiological agent is Gram-positive, non-spore forming, non-acid fast, facultative anaerobe with filamentous morphology (Reichenbach et al., 2009). The disease is likely to occur when there is breach in the continuity of mucosal layers followed by any injury, trauma or surgical course. Due to either of these predisposing factors, Actinomyces spp. penetrate into the deeper tissue and cause the clinical disease which is characterized by granulomatous abscessation which tend to be chronic in nature and lead to tissue fibrosis (Steininger and Willinger, 2016).

Pathogen can affect wide range of animals including caprines, ovines, bovines and equines. In ruminants, Actinomycosesbovis causes typical mandibular osteomyelitis due to which the disease is also called as ‘lumpy jaw’ (Chandratre et al., 2017). The disease with abscess formation was reported for the first time in cattle in 1945 that involved jaw. The malady is an uncommon disease without any limitation of age group, sex, and breed or immunocompetency status. Actinomyces spp. has zoonotic implications as well and cause abscessation in thoracic, abdominal and cervicofacial regions of the body in human patients (Garner et al., 2007). Abscess is usually polymicrobial containing 2-4 different types of bacteria and characteristics sulphur granules. Presence of these granules depicts tissue reactions to the infection (Westhoff, 2007). Treatment regimen adopted for curing the disease generally involve long-term administration having variable cure rates and use of antibiotics for longer periods of time pave the ways for antibiotic resistance development. In this case, non-antibiotic treatment using potassium iodied was evaluated.

1 Materials and Methods
A 4 months old buck of was presented to the Department of Clinical Medicine and Surgery, University of Agriculture, Faisalabad, Pakistan on 07/07/2017 with presenting complaint of being off-fed and swelling under the jaw. Buck was examined physically. All the vitals including temperature (103.4°F), respiration rate (18 breaths...
per minute), heart rate (75 beats per minute) and hydration status were found to be normal. There was no swelling of major lymph nodes. The only abnormality observed was presence of a mass under the mandible on left side (Figure 1). History revealed that the mass is gradually increasing in size and animal faces difficulty while chewing the feed. Upon palpation, hard mass was felt which was immovable. Aseptic aspiration was done and pus was oozed out of the mass. After getting complete history, observing clinical signs and conducting comprehensive physical and clinical examination, the case was diagnosed as Lumpy Jaw Disease.

![Figure 1 Significant swelling of mandible](image)

Animal was weighed and given potassium iodide (KI) @ dose rate of 70 mg/kg body weight orally once in a day. Total dose calculated was 1 gram per day and the treatment was continued for 25 days.

2 Results
Owner was also asked to pay a follow up visit so that the efficacy of treatment and its response can be evaluated. The results were found to be effective as the lesion started to regress after 10 days and completely receded after 25th day of the treatment.

3 Discussions
Actinomycosis is reported from all over the world but prevalence is higher in the countries with poor dental health and low socioeconomic status countries (Moniruddin et al., 2010). The disease is sporadic in its nature but causes substantial decrease in productivity of the animal as patients’ feed intake becomes decreased due to dysphagia and quidding. Facial distortion, loosening of teeth and dyspnea due to respiratory tract involvement are some of the complications of lumpy jaw. The differential diagnosis of disease includes stomatitis, rabies, fracture of mandible and tooth root abscesses (Radostits et al., 2005).

There are different treatment protocols and each of them has its own pros and cons. There has been great debate over the ideal possible therapy regimens for the cases of actinomycosis. As in lumpy jaw, abscess is mostly polymicrobial, thus no one single antibiotic can be regarded as drug of choice (Tanaka-Bandoh et al., 1997). Before the advent of penicillins and sulfa drugs, the disease led to severe disfiguring and disability in both humans and animals. With the advancements in chemotherapeutic approaches and knowledge about the pathology, both the severity and incidence of disease decreased. Almost all the antibiotics available today have variable degree of
inhibitory effect on Actinomyces species. Antimicrobial therapy has dubious role in the cases of lumpy jaw because of questionable treatment period length and possible side effects. For example, streptomycin had been used occasionally in past but now ban has been imposed due to risk of damage to cochleovestibular system. Similarly, it has been an established fact that chloramphenicol causes bone marrow depression so its use is also limited. Actinomyces species are highly susceptible to isoniazid but the dose is 5 times more than that of which is used in tuberculosis cases. Moreover, it also poses risk of development of neurological signs. Sulfadiazine, being bacteriostatic in action, has proven efficacy but the treatment time is highly variable even leading to months or so. Moreover, it can lead to crystalluria as well in dehydrated animals (Bennhoff, 1984). Surgical debridement and surgical removal of the mass are one of the best options until and unless it is not adhere to neighboring tissue. If the lesions have involved surrounding structures and complete excision is not possible, drainage of pus followed by washing with phenol and packing with tincture iodine soaked gauze has been found useful (Sudhakar and Ross, 2004).

All of the above discussed treatment regimens are either invasive or costly enough for the small-scale farmer due to length of treatment of duration. A better and effective alternative was evaluated in this particular case. Antibacterial therapy with potassium iodide was done and treatment was continued for 25 days. Favorable prognosis was observed without any noticeable side effect as the lesion started to regress after 10 days and completely disappeared after 25th day of the treatment.

Authors’ contributions
Mughees Aizaz Alvi, Imaad Rashid and Khurram Ashfaq were amongst the veterinary physician team at the Veterinary Clinic when the case was presented. Furthermore, Mughees Aizaz Alvi, Muhammad Umar Ijaz, Muhammad Haleem Tayyab and Noman Yousaf Faridi prepared the manuscript and final check was carried out by Mughees Aizaz Alvi.

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