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Varsha B

Veterinary Assistant Surgeon,
Peikulam, Thoothukudi,
Veterinary College and Research
Institute, Tamil Nadu
Veterinary and Animal Sciences
University, Tamil Nadu, India

Madeena Begum M

Assistant Professor, Veterinary
Clinical Complex, Veterinary
College and Research Institute,
Tamil Nadu Veterinary and
Animal Sciences University,
Tamil Nadu, India

Therapeutic management of corneal ulcer in cattle

Varsha B and Madeena Begum M

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Abstract

Corneal ulceration represents a significant ocular pathology in cattle, often leading to discomfort, vision impairment, and production losses. This case report describes a 3-year-old crossbred Jersey cow presenting with ocular discharge, corneal cloudiness, and a prominent white spot on the right eye, confirmed as ulceration via ophthalmic examination showing corneal discontinuity, positive menace response bilaterally, and absent pupillary light reflex in the affected eye. Treatment was initiated with ceftriaxone administered at 20 mg/kg body weight intravenously. Corneal swab culture revealed *Staphylococcus* spp. on Baird-Parker agar after 24-48 hours incubation at 37 °C. Post-treatment, rapid resolution of the ulcer was observed alongside improved corneal clarity and restored ocular function. These findings highlight the efficacy of ceftriaxone against staphylococcal keratitis in cattle, emphasizing the value of targeted antimicrobial therapy guided by microbiological confirmation.

Keywords: Corneal, ulcer, baird parker agar, ceftriaxone

1. Introduction

In vertebrate animals, the eye is a crucial special sense organ (Fernald, 1997) ^[5], and animals rely on it for both survival and environmental interaction (Vorobyev *et al.*, 2001 and Williams, 2010) ^[16, 17]. Ocular pathology provides information about the pathogenic mechanisms affecting the adnexal structures of the eye bulb (Orellana and Pifano, 2006) ^[13]. One of the layers that comprise the structure of the eyeball is the cornea, which is separated into five layers: endothelium, Descemet's membrane, stroma, basement membrane, and epithelium (Marcon and Foncesca, 2021) ^[11]. The cornea is a non-pigmented tissue that serves a number of purposes, including protecting the internal structures and preserving the form of the eyeball and sclera (Ferreira, 2022) ^[6].

A defect or rupture of the epithelium is the hallmark of corneal ulcers, which can have a number of reasons (Marcon and Foncesca, 2021) ^[11]. Corneal ulceration is frequently caused by trauma to the ocular surface. Weeds, grasses, hay, straw, and even tail switching can damage the corneal epithelium. Epiphora and blepharospasm may be the first signs of the ulcer; a closer look may show corneal opacity brought on by edema and miosis (Davidson and Pickett, 2008) ^[4]. Even though the eyelids and biological secretions like lysozyme, lactoferrin, secretory immunoglobulins, defensins, and precorneal tear film keep the eyes in a "near sterile state," a breakdown of the systemic and local defense mechanism permits colonization by opportunistic pathogenic bacteria in the air, dust, skin, fomite, and on vectors, to which the eyes are constantly exposed (Forsey and Darougar 1981; Salisbury *et al.*, 1995; Knop and Knop, 2005) ^[7, 14, 9].

The aim of this manuscript is to report a case of corneal ulcer in a crossbred Jersey cattle, in order to elucidate therapeutic measures and illustrate the process of visual recovery in the animal.

2. Case report

A 3-year-old crossbred Jersey cow was presented to the Veterinary Dispensary in Peikulam with complaints of ocular discharge and corneal opacity. During physical examination, a prominent white spot observed on the right eye (Fig. 1).

Corresponding Author:

Varsha B

Veterinary Assistant Surgeon,
Peikulam, Thoothukudi,
Veterinary College and Research
Institute, Tamil Nadu
Veterinary and Animal Sciences
University, Tamil Nadu, India

Ophthalmic evaluation revealed a clear corneal discontinuity consistent with ulceration, while the menace response remained intact in both eyes. Additionally, the pupillary light reflex was not visible in the right eye. Ocular swabs were taken using sterile swab sticks moistened with sterile normal saline. Precaution was taken to ensure that swabs did not touch the eyelid skin by opening the animal's eye wide and rotating swab stick forth and back on the corneal surface and conjunctiva. The samples were inoculated into nutrient broth and incubated aerobically at 37° C for 24 hours. For selective isolation of *Staphylococcus*, a loopful of the broth culture was inoculated onto Baird-Parker agar and incubated at 37 °C for 18-24 hours. Identification of the *Staphylococcus* isolates was based on colonial characteristics, microscopic characteristics, and biochemical characteristics such as production of catalase and oxidase, according to standard protocols (fig. 5, 6, 7, 8) (Lee, 2003) ^[10]. The treatment administered consisted of inj Ceftriaxone at the dose rate of 20 mg/kg intravenously (Buragohain *et al.*, 2021) ^[12], inj meloxicam at the dose rate of 0.5 mg/kg intramuscularly and inj Vitamin A at the dose rate of 200000 IU intramuscularly. Parenteral antibiotic was continued for 5 days. Topical treatment was administer red with Higati® (Gatifloxacin) eye drops five times daily.



Fig 1: Corneal ulcer and cloudiness in right eye at day 1



Fig 2: Slight reduction in corneal ulcer and cloudiness in right eye at day 3



Fig 3: Drastic reduction in corneal ulcer and cloudiness in right eye at day 5

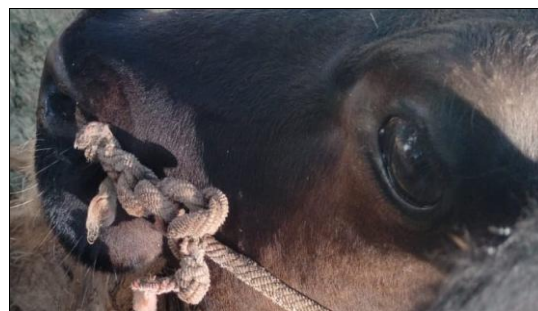


Fig 4: Complete reduction in corneal ulcer and cloudiness in right eye at day 7

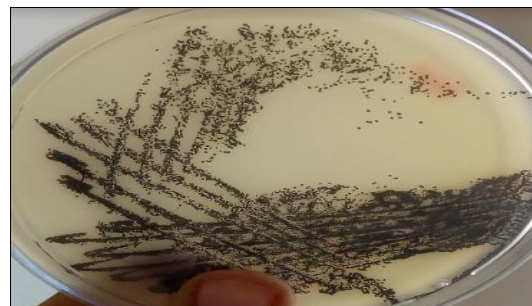


Fig 5: Baird Parker agar showing black colonies indicative of *Staphylococcus sp*

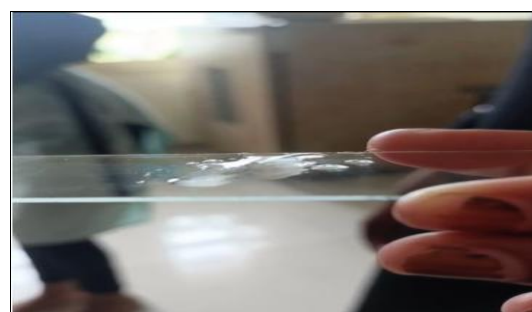


Fig 6: Production of effervescence indicative of presence of catalase.

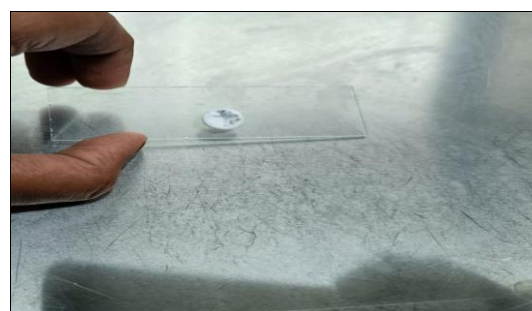


Fig 7: Oxidase test - negative indicative of *Staphylococcus sp*

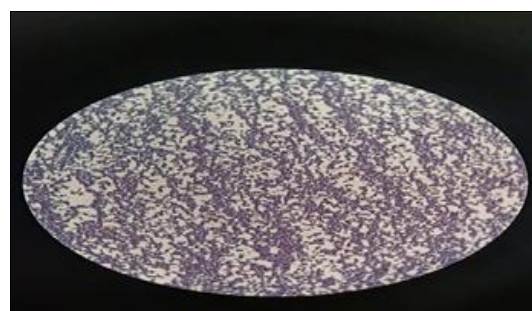


Fig 8: Microscopic images of Gram-positive bacteria (*Staphylococcus sp* with bunch of grapes of bacteria)

3. Results and Discussion

According to Slatter and Dietrich (2003) ^[15], blunt or acute damage typically results in globe rupture along the limbus rather than dissecting across the central cornea. A corneal swab cultivated in nutrient broth and particular Baird Parker agar showed distinct black, glossy colonies with clear zones in the latter, confirming the growth of *Staphylococcus sp.* Biochemical examination showed that the colonies were catalase positive and oxidase negative (Lee, 2003) ^[10]. *Staphylococcus sp.* can cause suppurative infections of ocular and periocular tissues and is common on skin and mucous membranes. Coagulase-positive *S. aureus* and *S. intermedius* and coagulase-negative *S. epidermidis* are the most frequently isolated bacteria from eye infections. Enzymes like coagulase, hemolysin, collagenase, hyaluronidase, protease, and others are known to be produced by staphylococci. They also generate dermonecrototoxin. Multiple antibiotic resistance can develop in *S. intermedius* (Moore and Nasise, 1999) ^[12].

Staphylococci infections are very significant in both human and veterinary medicine. One of the most important pathogens that infect dairy cattle globally is *S. aureus* (Zadoks *et al.*, 2000) ^[18]. However, *Staphylococcus* has been considerably underdiagnosed in the majority of ocular infections of food-producing animals, most likely because of its widespread occurrence and the vague clinical signs of animals during infection. Furthermore, treating *Staphylococcus* associated ocular infections is getting harder due to the increase in the isolation of antibiotic-resistant *Staphylococcus* in animals. As a result, the cost of producing food animals rises (Abdullah *et al.*, 2013; Davidson *et al.*, 1999) ^[1, 3].

In the present study, treatment with ceftriaxone, a third-generation cephalosporin, demonstrated a drastic reduction in corneal ulcers in cattle (Fig. 3, 4), effectively targeting bacterial pathogens through its broad-spectrum activity against Gram-positive and Gram-negative organisms (Buragohain *et al.*, 2021) ^[2]. Concurrently, vitamin A supplementation aids in the repair of damaged corneal epithelium by promoting epithelial cell differentiation and mucin production, essential for restoring corneal integrity (Fowler and Mikota, 2008) ^[8]. This nutrient also enhances overall vision improvement by supporting retinal health and preventing secondary complications like xerophthalmia in treated animals. The combined therapeutic approach of ceftriaxone and vitamin A thus addresses both the infectious cause and the structural repair needs of corneal ulcers in cattle. Such multimodal therapy underscores the importance of integrating antimicrobial and nutritional interventions for optimal outcomes in large animal ophthalmology.

Conflict of Interest

The authors declare that there is no conflict of interest.

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References

1. Abdullah FFJ, Adamu L, Osman AY, Haron AW, Saharee AA. Clinical management of stage III infectious bovine keratoconjunctivitis associated with *Staphylococcus aureus* in a dairy cow: a case report. IOSR Journal of Agricultural and Veterinary Science. 2013;4(4):69-73.
2. Buragohain R, Sar TK, Biswas U, Samanta I, Mandal TK. Pharmacokinetics and efficacy of ceftriaxone in staphylococcal mastitis in crossbred cows following single intravenous administration. Current Drug Metabolism. 2021;22(5):383-390.
3. Davidson HJ, Stokka GL, Taul T. Prevalence of ocular lesions in cattle from a Kansas sale barn. Kansas Agricultural Experiment Station Research Reports. 1999;1:58-60.
4. Davidson HJ, Pickett JP. Selected eye diseases of cattle. In: Anderson DE, Rings M, editors. Current Veterinary Therapy. Philadelphia: Saunders Elsevier; 2008:421-427.
5. Fernald RD. The evolution of eyes. Brain Behavioural Evolutions. 1997;50:253-259.
6. Ferreira LA. Utilização de plasma autólogo no tratamento de úlceras da córnea no cão: estudo retrospectivo de 30 casos. Lisboa: Universidade de Lisboa; 2022.
7. Forsey T, Darougar S. Transmission of chlamydiae by the housefly. British Journal of Ophthalmology. 1981;65(2):147-150.
8. Fowler M, Mikota SK, editors. Biology, medicine, and surgery of elephants. Hoboken: John Wiley & Sons; 2008.
9. Knop E, Knop N. The role of eye-associated lymphoid tissue in corneal immune protection. Journal of Anatomy. 2005;206(3):271-285.
10. Lee JH. Methicillin (oxacillin)-resistant *Staphylococcus aureus* strains isolated from major food animals and their potential transmission to humans. Applied and Environmental Microbiology. 2003;69(11):6489-6494.
11. Marcon IL, da Fonseca Sapin C. Causas e correções da úlcera de córnea em animais de companhia-revisão de literatura. Research, Society and Development. 2021;10(7):e57410716911-e57410716911.
12. Moore CP, Naisse MP. Clinical microbiology. In: Gelatt KN, editor. Veterinary Ophthalmology. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 1999:259-290.
13. Orellana ME, Pifano IAD. Patología ocular para el patólogo general. Revista de Oftalmología Venezolana. 2006;16-31.
14. Salisbury MAR, Kaswan RL, Brown J. Microorganisms isolated from the corneal surface before and during topical cyclosporine treatment in dogs with keratoconjunctivitis sicca. American Journal of Veterinary Research. 1995;56(7):880-884.
15. Slatter D, Dietrich U. Cornea and sclera. In: Slatter D, editor. Textbook of Small Animal Surgery. 3rd ed. Philadelphia: W B Saunders; 2003:1368-1396.
16. Vorobyev M, Marshall J, Osorio D, Hempel de Ibarra N, Menzel R. Colourful objects through animal eyes. Color Research & Application. 2001;26(S1):S214-S217.
17. Williams DL. Congenital abnormalities in production animals. Veterinary Clinics: Food Animal Practice. 2010;26(3):477-486.
18. Zadoks R, Van Leeuwen W, Barkema H, Sampimon O, Verbrugh H, Schukken YH, *et al.* Application of pulsed-field gel electrophoresis and binary typing as tools in veterinary clinical microbiology and molecular epidemiologic analysis of bovine and human *Staphylococcus aureus* isolates. Journal of Clinical Microbiology. 2000;38(5):1931-1939.

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