

CLINICAL MANAGEMENT OF GANGRENOUS MASTITIS IN A 3-YEAR-OLD SAHEL DOE: A CASE REPORT

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ABSTRACT

Mastitis is an inflammatory condition of the mammary gland, typically caused by infectious microorganisms or physical injury to the udder. In this case, a milk sample was cultured on blood agar, and a catalase test was performed as part of the biochemical identification. Surgical intervention involved amputation of the affected teats, followed by closure of the udder using a simple continuous suture pattern. Postoperative management included administration of antibiotics, multivitamins, anti-inflammatory drugs, and analgesics. Laboratory results indicated the growth of *Staphylococcus aureus* on blood agar, with the catalase test yielding a positive result.

1. INTRODUCTION

Goat husbandry is becoming increasingly important due to its meat and milk products. Moreover, goat milk provides much-needed animal protein supplement, particularly in developing countries such as Nigeria whose goat milk consumption is gaining importance in some parts of the country (Garba et al., 2019). These species (goats) constitute about 26.5×10^{10} in Nigeria, the majority of which was located in the extreme northern Sahel region of the country (Garba et al., 2019). However, management and disease problems, particularly mastitis, constitute major constraints for effective dairy goat husbandry in Nigeria, although the prevalence of other infectious mastitic agents from different locations has been previously reported (Garba et al., 2019). Mastitis is the inflammatory response of the mammary tissue due mainly to infecting microorganisms (Albenzio, et al. 2019).

The disease is usually classified as subclinical, acute, subacute, chronic, and gangrenous based on etio-pathological findings and observations (Sani et al., 2015). The condition is characterized by a range of physical and chemical changes in the milk, and pathological changes in the glandular tissues of the udder (Radostits et al., 2007; Singh et al., 2018). Several pathogens can cause mastitis, but *Staphylococcus* spp. are the most frequently diagnosed causal microorganisms of IMI in goats. Other pathogens such as *Streptococcus* spp., Enterobacteriaceae, *Pseudomonas aeruginosa*, *Mannheimia haemolytica*, *Corynebacteria* and fungi can produce Intramammary infection in small ruminants, but occurrence rates are lower (Contreras et al., 2007; Singh et al., 2018). Predisposing factors like improper management, poor hygiene, teat injuries and faulty milking machines are known to hasten the entry of infectious agents and the course of the disease (Majic et al., 1994; Singh et al., 2018). An Acute mastitis is manifested by a hot, reddened, swollen udder which is painful to touch. Chronically affected

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udders may be firm or wither without evidence of pain. A Clinical mastitis (CM) presents significant clinical features of inflammatory signs in udder tissues and abnormal udder secretion whereas the sole indicator of subclinical mastitis is higher somatic cell count in milk without any visible abnormalities in udder tissue and milk. Diagnosis of mastitis is a cumbersome task and commonly it can be done by California Mastitis Test (CMT) and Somatic Cell Counts (SCC). Bacteriological isolation and PCR identification can also be done to hasten diagnostic procedures (Paterna et al., 2014; Singh et al., 2018).

2. MATERIALS AND METHODS

Culture and Biochemical test

Milk samples were collected for Bacterial culture and Biochemical test. Milk sample was cultured on Blood agar and biochemical test carried out was catalase test.

Case History and Clinical Examinations:

On the 1st of March 2024. A client reported to the Large Animal Unit of Veterinary Teaching Hospital University of Maiduguri with a complaint of injury on the mammary gland of his goat and refuse milking the kids due to pain. The Signalment are Specie: Caprine, Sex: female, Breed: Sahel, Age: 3 years, Body weight: 30kg, Number in herd: 10, Morbidity: 0, Mortality: 0. Clinical Findings are milk reddish in colour, inflammation, swelling, heat, pain and open wound.

3. RESULTS AND DISCUSSION

Goat milk can be affected by various factors which are non-infectious and infectious. The non –infectious factors include breed, age, stage of lactation, estrous cycle, nutrition and injuries. The infectious factors are inflammatory reactions in the mammary gland caused by bacteria and fungi and viruses (Le Marechal et al., 2011; Mc Dougall et al., 2014; Novac and Andrei,2020). In our case the mastitis is due to injury, and this confirm the report of (Mohammed et al., 2014; Garba et al., 2019) that management system usually predisposes goats to mastitis due to injuries (abrasions, perforations, and teats ulcerations). *Staphylococci*, *streptococci* and *Escherichia coli* are the most common bacterial organisms isolated from mastitis in goats and this confirm our findings as reported by (Bergonier et al., 2003; Le Marechal et al., 2011; Mc Dougall et al., 2014). Routine diagnosis of mastitis is usually by physical examination, culture, hematological and biochemical test as well as ultrasound (Contreras et al., 2007; Casal, 2015; Garba et al., 2019). Mastitis causes changes in the mammary tissues depending on the severity of lesions and the degree of damage of the udder parenchyma, but an

important factor is the pathogen causing the infection (Sani et al., 2015). The physiological changes caused by mastitis on milk biochemical parameters have been thoroughly researched for cows while there are few studies regarding sheep and goat compared to cows. However, mastitis decreases milk production and is responsible for unfavorable changes in milk composition (Jozwik et al., 2012; Novac and Andrei,2020). Beyond animal health and food safety matters, mastitis is also a problem for the dairy industry due to changes in milk composition (Contreras et al., 2007; Novac and Andrei,2020). The client was advice to improve management practices by maintaining good hygiene practices, such as washing hand before milking and prevent teat injuries.

Table 1: Patient vital parameters on Presentation

Vital Parameters	Values obtained	Referenced values
Temperature	38.7°C	39.5 - 40.5°C
Pulse rate	79 beats/min	70 – 90 beats/min
Respiratory rate	23 cycles/min	25-35cycles/min

Management:

Lignocain infiltration 5mls I.M

Debridement and cutting off the teats of the udder and cleaning with Hydrogen peroxide

Antibiotic cicatrin powder® was applied topically suturing the udder using simple continuous suture pattern.

Postoperative care

Inj. 20% Oxytetracycline 20mg/kg 2.4mls × 3/10 I.M

Inj. Multivitamines 3mls × 3/7 I.M

Inj. Dexamethasone 1.5mls × 3/7 I.M (1.5mg/ml)

Inj. Diclofenac 1.5mls × 3/7 I.M (25mg/ml)



Plate A: clinical sign of Gangrenous Udder **Plate B:** Aspiration of Mastitis Milk sample for Bacterial culture and biochemical test



Plate C: Cutting off teats and suturing the udder using simple continuous suture pattern. **Plate D:** topical application of wound healing oil. **Plate E:** Growth of *staphylococcus aureus* on Blood agar and **Plate F:** biochemical test shows catalase positive

4. CONCLUSION

In conclusion, laboratory results show Growth of *staphylococcus aureus* on Blood agar and biochemical test shows catalase positive. The success of the treatment depends on the use of effective antibiotics based on culture and sensitivity test and proper therapeutic care. This case is a pointer that mastitis is a localised problem of the udder without much systemic involvement.

5. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interest regarding the publication of this article.

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