Case Report

Partial mastectomy as management for unilateral gangrenous mastitis in a lactating Red Sokoto goat

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ABSTRACT

A 7-year-old lactating Red Sokoto goat was presented to the veterinary clinic, Aliyu Jodi Road Sokoto, with the complaint of inappetence, weight loss, reduced milk output and foul-smelling udder four weeks after kidding. The goat weighed approximately 25 kg. The patient appears dull with rough hair coat, the right mammary gland was necrotic and blue-greenish, atrophied, hardened with a lacerated base, painful to touch with foul smelling. Gangrenous mastitis was diagnosed and animal as scheduled for surgery. The surgery was successfully conducted; the animal was later discharged 16 days post-surgery.

Keywords: Mastitis, Mammary gland, Foul smelling discharges, Sensitivity test, Gangrenous

INTRODUCTION

Mastitis is an inflammation of the mammary gland/udder usually resulting from colonization by infectious agents or trauma of various kinds and can affect all domestic animals. Thrombosis of the mammary vessels often occurs due to virulent strains of bacterial pathogens such as Staphylococcus aureus and E. coli with Clostridium welchii, thus leading to infarction and gangrene.1 Other viral and non-viral causes of mastitis have also been reported.2 It is characterized by a range of physical and chemical changes in the milk, and pathological changes in the glandular tissues of the udder.3 It can present as sub-clinical infection or clinical disease; which can be acute or chronic.4

Gangrene of mammary gland is observed following acute mastitis and conditions associated with warmth and high moisture may favor rapid multiplication of saprophytic and putrefactive organisms in the dead tissue.5 Mastitis can be diagnosed using California mastitis test, somatic cell count, bacteriological isolation and PCR.6 Factors that are known to influence the type and the frequency of isolation of organisms causing mastitis in animals include the process of milking, management practice, feeding, number of days not lactating, and number of milking per day, as well as geographical location.7 Gangrenous mastitis is difficult to manage and in very severe cases, the gangrene may lead to toxemia and death.8

CASE REPORT

A seven years old, approximately 25 kg body weight, lactating Sokoto Red goat was brought to the veterinary clinic Sokoto, Nigeria, with the complaint of inappetance,
weight loss, reduced milk output and foul smelling udder four weeks after kidding.

**Clinical examination**

On examination, the patient appears dull with rough hair coat, the right mammary gland was necrotic and blue-greenish, atrophied, hardened with a lacerated base, painful to touch with foul smelling. Teat was necrotic and no milk was found when the mammary gland was expressed, however, the left mammary gland was apparently normal. The rectal temperature, respiratory rate and pulse rate were 39.2°C, 88 beats per minute and 30 cycles per minute respectively. The ocular mucous membrane was slightly pale, capillary refill time was 3 seconds and unilateral gangrenous mastitis was diagnosed and partial mastectomy scheduled for the affected udder.

**Laboratory examination**

Hematological findings revealed a packed cell volume, of 20%, below the physiological range (22-38%). Neutrophils, eosinophils, monocytes and lymphocytes were 68%, 1%, 2%, and 29% respectively. *S. aureus* was isolated on MacConkey and mannitol salt agar. Antibiotic sensitivity test further revealed that the organism is susceptible to gentamycin, chloramphenicol and erythromycin, resistant to cloxacillin, cotrimoxazole and amoxicillin.

Histopathology result shows cute necrotizing mastitis with gram positive cocci and inflammatory infiltration.

**Surgical management**

The surgical site was shaved, washed and prepared aseptically. The animal was put on the left lateral recumbency with lower epidural anesthesia using 2 ml of 2% solution of lidocaine HCl. Ring block was also done locally on the mammary gland with 10 ml of 2% lidocaine. Skin incision was made at the border of the affected udder; the procedure continued by blunt dissection, bleeding was controlled by applying digital pressure on the minor bleeders as well as clamping and ligation of the major arteries. Subsequently, the affected quarter was removed and the area was cleaned with povidone iodine to minimize contamination. The gangrenous skin tissue was trimmed, closed with horizontal mattress superimposed by ford interlocking suture pattern using size 1 monofilament nylon.

**Post-operative care**

Based on culture sensitivity test, injection gentamicin was used during post-operative care, diclofenac sodium and multivitamins were administered intramuscularly for seven days.

**Histopathology**

Histopathology examination of the tissue revealed areas of necrotizing inflammation and inflammatory cellular exudates mixed with gram positive cocci rounded by eosinophil fibrous tissue as well as hyaline degeneration and multiple colonies of gram positive *Cocci* which further confirmed the condition of gangrenous mastitis.

**Figure 1:** Photomicrograph of section mammary gland showing areas of necrotizing inflammation (A) and inflammatory cellular exudates mixed with gram positive cocci rounded by eosinophil fibrous tissue (arrows) HE 40X.

**Figure 2:** Photomicrograph of section mammary gland showing areas of hyaline degeneration (A) and multiple colonies of gram positive cocci (arrows) HE 100X.

**Figure 3:** Preparation of the surgical site.
Figure 4: Prepared of the surgical site.

Figure 5: Draped surgical site.

Figure 6: Removal of gangrenous part of the mammary gland.

Figure 7: Removal of gangrenous part of the mammary gland.

Figure 8: Debrided site.

Figure 9: Skin closure.
DISCUSSION

Gangrenous mastitis is a form of mastitis, characterized by necrosis of the udder tissue; it is caused by alpha-toxins. Mastitis is a severe clinical manifestation of inflammatory process in mammary glands. Gangrenous mastitis is mostly presented as a discolored (blue-blackish or blue-greenish) and cold udder, development of abscess with a demarcation line of the affected tissue, and draining pus.

Gangrenous mastitis in goats tends to have poor prognosis as septicemia can easily develop. Early treatment is therefore a key to the success of treatment and appropriate antibiotics based on culture sensitivity test should be used. Identification of etiological agent is crucial to determine the appropriate therapeutic regime. Gangrenous mastitis in goats is often due to mixed infection by S. aureus, C. perfringens and E. coli. E. coli has been reported to be one of the important causative agents in most of the clinical cases of gangrenous mastitis in goats and is also present in most of mastitis caused by mixed infection.

In conclusion, antibiotics alone are not always effective for treatment of gangrenous mastitis, however, treatment with antibiotics based on sensitivity test to prevent the septicemia is recommended. Furthermore, surgical removal of the gangrenous udder is an immediate management option. Surgical treatment of the gangrenous mastitis in this report was in accordance with several other reported cases, we therefore recommend that, partial mastectomy should be considered as the best option for the management of gangrenous mastitis in goats.

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