

Case Report

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

Nura Abubakar^{1*}, Faruku Bande², Hassan A. Bodinga¹, Aminu Barmo²,
Hameed S. Ayobami³, M. S. Abubakar⁴

¹Department of Surgery and Radiology, ⁴Department of Veterinary Pathology, Faculty of Veterinary Medicine, Usmanu Danfodiyo University, Sokoto, Nigeria

²Ministry of Animal Health, Sokoto, Nigeria

³Faculty of Veterinary Medicine, Usmanu Danfodiyo University, Sokoto, Nigeria

Received: 10 November 2019

Accepted: 16 December 2019

Accepted: 17 December 2019

*Correspondence:

Dr. Nura Abubakar,

E-mail: nuravet@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

A 7-year-old lactating Red Sokoto goat was presented to the veterinary clinic, Aliyu Jodi Road Sokoto, with the complaint of inappetance, 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%).⁹ Neutrophils, eosinophils, monocytes and lymphocytes were 68%, 1%, 2%, and 29% respectively. *S. aureus* was isolated on Macconky and mannitol salt agar.¹⁰ antibiotic sensitivity test further revealed that the organism is susceptible to gentamycin, chloramphenicol and erythromycin, resistant to cloxacillin, cotrimoxazole and amoxicillin.

Histopathology result shows acute 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.

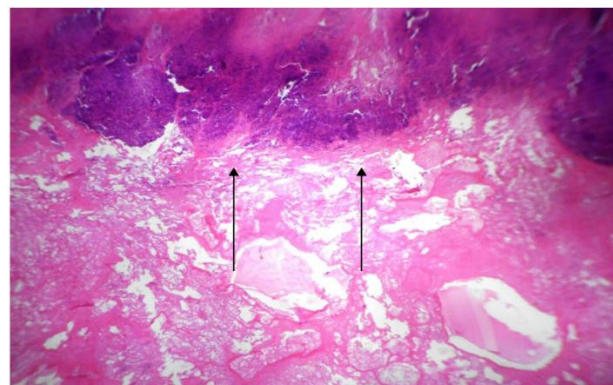


Figure 1: Photomicrograph of section mammary gland showing areas of necrotizing inflammation (A) and inflammatory cellular exudates mixed with gram positive cocci rounded by eosinophil fibrous tissue (arrows) HE 40X.

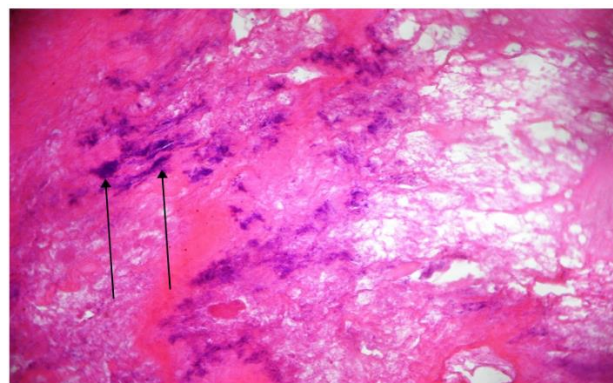


Figure 2: Photomicrograph of section mammary gland showing areas of hyaline degeneration (A) and multiple colonies of gram positive cocci (arrows) HE 100X.



Figure 3: Preparation of the surgical site.



Figure 4: Prepared of the surgical site.



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



Figure 5: Draped surgical site.



Figure 8: Debrided site.



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



Figure 9: Skin closure.



Figure 10: 16 days post-surgery.

DISCUSSION

Gangrenous mastitis is a form of mastitis, characterized by necrosis of the udder tissue; it is caused by alpha-toxins.¹¹ 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.⁸

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*.⁸ *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.¹²

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.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Sastry GA. Veterinary Pathology. 7th edition. CBS Publishers and Distributors; 2001: 226-227.
2. Pal SK, Siddiky AMN. Dairy Production, Quality Control and Marketing System in SAARC Countries; SAARC Agriculture Centre. 2011.
3. Radostits OM, Gray CC, Hinchcliff KW, Constable PD. Mastitis in veterinary medicine. A text book of the disease of Cattle, Horse, Sheep, Pigs and Goats. 10th Edn. Spain: Sounder; 2007: 673-749.
4. White E. Prevalence of mastitis in small ruminants and the effect of mastitis on small ruminant production. NMC Annual Meeting Proceedings. 2007.
5. Chauhan HVS. A Text Book of Veterinary General Pathology. 1st edition. Lucknow: International Book Distributing Company; 1997: 156-157.
6. Paterna A, Contreras A, Gómez-Martín A, Amores J, Tatay-Dualde J., Prats-van der Ham M, et al. The diagnosis of mastitis and contagious agalactia in dairy goats. Small Ruminant Res. 2014;121:36-41.
7. Gomes V, Matazo MP, da Costa e Silva CP, Baldacim VAP, Novo SMF, Baccili CC, et al. Etiology and risk factors for mammary infection of dairy goat from São Paulo State. Semina: Ciências Agrárias (Londrina). 2014;35:2551-61.
8. Ribeiro MG, Lara GHB, Bicudo SD, Souza AVG, Salerno T, Siqueira AK, et al. An unusual gangrenous goat mastitis caused by *Staphylococcus aureus*, *Clostridium perfringens* and *Escherichia coli* co-infection. Braz J Veterinary Animal Sci. 2007;59:810-2.
9. Gyang, EO. Caesarean Section. In: Introduction to Large Animal Surgery. Agitab, Kaduna, 1990: 397-340.
10. Begum HA, Uddin MS, Islam MJ, Nazir KHMNH, Islam MA, Rahman MT. Detection of biofilm producing coagulase positive *Staphylococcus aureus* from bovine mastitis, their pigment production, hemolytic activity and antibiotic sensitivity pattern. J Bangladesh Society Agricultural Sci Tech. 2007;4:97-100.
11. Smith MC, Sherman DM. Mammary gland and milk production in goat medicine. 2nd ed. Ames, Iowa: Wiley Blackwell; 2009: 647-689.
12. Chandrasekaran D, Venkatesan P, Tirumurugan KG, Gowri B, Subapriya S, Thirunavukkarasu S. Sub-acute mastitis associated with Methicillin Resistant *Staphylococcus aureus* in a cow: A case report. J Advanced Veterinary Animal Res. 2014;1:235-7.

Cite this article as: Abubakar N, Bande F, Bodinga HA, Barmo A, Ayobami HS, Abubakar MS. Partial mastectomy as management for unilateral gangrenous mastitis in a lactating Red Sokoto goat. Int J Sci Rep 2020;6(2):73-6.