

SURGICAL MANAGEMENT OF UNILATERAL RECURRENT MASTITIS IN A FOUR-YEAR-OLD KALAHARI DOE: A CASE REPORT

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ABSTRACT

A four-year-old female Kalahari goat, weighing 43kg, was presented to the Veterinary Teaching Hospital, Federal University of Agriculture, Abeokuta, with complaint of severe inflammation of the right udder. Conservative medical treatment was previously done on two occasions, with the administration of penicillin-streptomycin antibiotic with successful regression, but recurrence following kidding. Bacteriological culture of fine needle aspirate, revealed the presence of *Staphylococcus species* while antibiotic sensitivity test showed sensitivity to ciprofloxacin and pefloxacin. However, histopathology did not show any evidence of neoplastic cells. It was diagnosed of bacterial mastitis based on the results of microbiology and cytopathology. A unilateral mastectomy was used to successfully treat this condition. Oral ciprofloxacin (1000mg/kg) was administered post-surgery. In conclusion, unilateral mastectomy can be considered the best option of treating recurrent bacterial mastitis, with the intention of salvaging the contralateral healthy udder.

Keywords: Recurrent mastitis, *Staphylococcus species*, Kalahari doe, Unilateral mastectomy

INTRODUCTION

Mastitis is a very serious problem in goat breeding which may lead to a decrease in overall health (Shittu *et al.*, 2008). The economic impact of mastitis on reproduction failure has only gained attention in the last decade (Wolfenson *et al.*, 2015). Depending on the severity of the disease, mastitis could result in decreased revenue for farmers through loss of milk production, increased use of veterinary drugs and higher culling rate (Halasa *et al.*, 2007). It is more frequent in dairy and meat goats raised under intensive and semi intensive management practices (Kyozaire *et al.*, 2005).

Mastitis is generally associated with poor hygiene, bruising of mammary teat from traumas, sucking, fly bites or other wounds to skin, that provide an important barrier to infection (Marogna *et al.*, 2010). Various pathogens (bacteria, virus and fungi) and their toxins are linked with this disease. Most cases of pathogenic mastitis are reported to be due to staphylococcus infection (Hötzel *et al.*, 2001; Bergonier *et al.*, 2003; Moroni *et al.*, 2005). Moreover, predisposing factors such as extreme temperature, muddy and wet living conditions, abnormal anatomy of the udder or teat, sudden change in diet and a compromised immune system are incriminated in mastitis (Gomes *et al.*, 2014). Diagnosis of mastitis is a cumbersome task and can be done by California Mastitis Test, Somatic Cell Counts, bacteriological isolation and Polymerase chain reaction (Paterna *et al.*, 2014).

Treatment of mastitis can be achieved medically, through the use of antibiotics and/or with surgical excision when medical intervention proves unrewarding. Prevention of cases of mastitis usually centers on improving hygiene of the barn, milking practices, and utensils used for milking. Providing a clean environment with minimum stress for the goat herd is essential.

This case report describes the surgical approach of unilateral mastectomy as a treatment option in

a four-year-old Kalahari doe with recurrent unilateral mastitis, while retaining the function of the contralateral udder.

CASE REPORT

History and clinical observations

A 43kg, four-year-old Kalahari doe was presented to the Veterinary Teaching Hospital, Federal University of Agriculture Abeokuta with history of reduced appetite and complaint of recurrent severe inflammation of one of the mammary glands. Previously, the doe had similar occurrences of mastitis twice, following parturition, and was treated with penicillin-streptomycin antibiotics during those period, but there was regular reoccurrence. At presentation, the right udder was excessively enlarged, turgid and pendulous and discharged milk on impression (Plate 1). The doe was also slightly dull and fairly lean. Ocular mucous membrane was pink, and none of the superficial lymph nodes were enlarged. Hair coat appeared lustrous, without ectoparasites.

Laboratory test

Blood sample (5ml) was collected via jugular phlebotomy, using a sterile hypodermic 21' needle and syringe for complete blood count and antibiotics culture and sensitivity test. Also, fine needle aspirate was collected from the affected udder for cytology.

RESULTS

Results of haematology were essentially normal (Table 1) and positive for *Trypanosoma species*. Bacteriological culture revealed *Staphylococcus species*. Antibiotic sensitivity test revealed that the organism was sensitive to ciprofloxacin and pefloxacin, whereas it was moderately sensitive to Septrin, Rocephin, Streptomycin, Erythromycin, Amoxicillin, Gentamycin, Ampiclox and resistant to Zinnucf. Cytology however, showed there was no evidence of cells. Based on the microbiological findings, a diagnosis of unilateral bacterial mastitis was made.

Table 1: Haematology result in a four-year-old Kalahari doe with unilateral bacterial mastitis

Parameters	Kalahari doe	Reference Value
Packed Cell Volume (PCV)	25%	22 – 38%
Total White Blood Cell (WBC) count	5.2 X 10 ⁹ /L	4 – 13 X 10 ⁹ /L
White Blood Cell (WBC) Differential count	Neutrophil = 36%	30 – 48%
	Lymphocyte = 62%	50 – 70%
	Monocyte = 02%	0 – 4%
	Eosinophil = 00%	1 – 8%
	Basophil = 00%	0 – 1%

Treatment

The doe was scheduled for unilateral mastectomy. Prior to surgery, the doe was starved overnight but was given access to water until the anaesthetic agent was about to be administered. Premedication was done with intramuscular injection of 90 mg/kg acepromazine (Atocan®, SishuiXierkang Pharma, China). Following premedication, venous access was secured at the jugular vein using size 21' scalp vein needle. Furthermore, the mammary glands and surrounding area was prepared aseptically. Epidural anaesthesia was then induced with lumbosacral injection of 0.2 ml/kg 2% Lidocaine Hydrochloride (Provive®, TakPharmaceuticals Limited, India). Intravenous fluid was provided at the rate of 5 ml/kg/hr to maintain the cardiovascular system using lactated Ringers solution (Unique Pharmaceuticals Ltd).

Following anaesthesia, the goat was placed on left lateral recumbency and the legs were secured to the operating table using gauze strips. Proper primary and skin incision drapes were applied (Plate 2). An elliptical skin incision of about 7cm diameter was made

around the base of the right mammary gland and another incision of about 3cm dividing the left and right mammary glands (plate 3). The skin was dissected from the glandular tissue and body wall. The glandular tunic was separated from the abdominal wall and blood vessels (plate 3). The superficial caudal epigastric vessels, external pudendal, and perineal blood vessels were ligated with chromic catgut size 1 (Agary®). The mass of the infected mammary tissue along with the associated lymph nodes were then excised after ensuring that the vasculature between the udder halves was tightly ligated (plate 4). The surgical area was flushed with normal saline solution (Unique Pharmaceuticals Ltd).

The weight of the excised mass was 1.7 kg (Plate 5). Obliteration of dead spaces was carried out using simple interrupted pattern with chromic catgut size 1 (Agary®). The subcutis was closed using subcuticular pattern with chromic catgut size 1 (Agary®). The skin was closed using horizontal mattress pattern with polypropylene size 1 (Agary®) [Plate 6].



Plate 1: A 43kg, four-year-old Kalahari doe presented with an excessively enlarged, turgid, pendulous right udder (Black Arrow)



Plate 2: Preparation and draping of the surgical site



Plate 3: Separation of glandular tunic and ligation of blood vessels



Plate 4: Excision of the inflamed right udder



Plate 5: The excised right udder



Plate 6: Skin closure

Postoperative Management and outcome

Following recovery from anaesthesia, the goat was treated with oral administration of 500mg ciprofloxacin tablets (R. K. Laboratories, India), consecutively for 7 days. In addition, flunixin meglumine (Norbrook®), 2.2 mg/kg was given intramuscularly for 7 days. Tetanus anti-toxin was also given post-operatively. Skin stitches were removed 10 days after the surgical procedure.

DISCUSSION

In goats, mastitis is considered as a severe clinical outcome of inflammatory process in mammary gland. In a previous study by Vautor *et al.*, (2009), it was reported that mastitis occurred more frequently in ewes, and most animals suffered from a severe unilateral attack of mastitis. A wide range of micro-organisms cause mastitis but most cases are reported to be due to staphylococcus infection (Bergonier *et al.*, 2003) and this was true for this case. Mastitis is generally associated with poor hygienic practices and caused by the bruising of mammary teat from traumas, sucking, fly bites (Marogna *et al.*, 2010). Going by the aforementioned aetiologies of mastitis, the present case can however, be considered lactational mastitis, since its onset is usually at puerperium.

In 2001, El-Maghraby documented that it was easier to carry out bilateral mastectomy in contrast to unilateral mastectomy, because of the need for intense haemostasis in unilateral mastectomy. However, in the present case, only the right udder was infected and it was said that the goat would continue to breed and lactate, therefore the decision to salvage the left udder by performing a unilateral mastectomy. Surgical removal of the infected tissue is an immediate management option to prevent formation of dead and dying tissues (gangrene) (Davis, 2014).

Peer and Bhattacharyya (2007) had earlier reported that the highest prevalence (40%) of mastitis was observed in goats 1–6 years of age. The goat in the present case was 4 years old and agrees with the reported age range. Does can contract the infections after birth but infection

can also occur during lactation and after dry period (Moroni *et al.*, 2005). The recurrence as a result of lactation was however assumed to be the case for this report.

Diagnosis of mastitis can be done by bacteriological isolation as employed in this case (Paterna *et al.*, 2014). The importance of diagnosis and treatment of mastitis in small ruminants is however of utmost importance for economic, aesthetic and welfare points of view. The doe in the present study was however, required for further breeding purpose.

Treatment of mastitis can be based on both medical and surgical approach depending on the severity and need to relieve animal of its discomfort. Surgical excision, which was eventually done in this case, is usually employed when medical intervention with the use of antibiotics proves unrewarding. In chronic mastitis, gangrenous lesions or neoplastic cases where medical treatment is a limited choice, unilateral or bilateral mastectomy is recommended (Andreasen *et al.*, 1993; Cable *et al.*, 2004).

In general, antibiotics are not always effective as they are not able to enter into the infected tissues sufficiently (Davis, 2014), but treatment with antibiotics (ciprofloxacin) is necessary, based on sensitivity test to prevent the septicemia after surgery. Pain and inflammatory response after surgery is inevitable flunixin meglumine was administered for these purposes. In the management of this case, post-operative complications seen included short term swelling as well as hardness due to scar tissue formation and these resolved after 3 days of treatment with flunixin meglumine.

CONCLUSION

The present case report shows successful surgical excision of recurrent unilateral bacterial mastitis in a goat under light sedation and epidural anaesthesia. The surgical procedure was however safe without serious complications and may be recommended for localized diseases of udder in goats.

Overall, the success rate and client satisfaction makes the unilateral mastectomy a viable alternative treatment of goats with recurrent bacterial mastitis that has been unresolved by medical treatment.

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