Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v2024i1.792
*Biol. Clin. Sci. Res. J., Volume, **2024**: 792*
Case Report

PARTIAL MASTECTOMY IN A DAIRY BEETAL GOAT AFFECTED WITH A MAMMARY TUMOR – A CASE REPORT

ASIF M[1], REHMAN FU[*2], ALI M[3], HUSSAIN D[1], IQBAL S[3], ALI A[1], NASRULLAH[2], AZIZ A[4], KHAN S[2], JAN A[2]

[1]*Department of Clinical Sciences, University of Layyah, Layyah, Pakistan*
[2]*Department of Veterinary Medicine and Surgery, Lasbela University of Agriculture, Water and Marine Sciences, Uthal, Pakistan*
[3]*Department of Pathobiology, University of Layyah, Layyah, Pakistan*
[4]*Department of Veterinary Clinical Sciences, University of Poonch, Rawalakot, Pakistan, Pakistan*
**Corresponding author email address: fazal.vas@luawms.edu.pk*

(Received, 19th December 2023, Revised 14th February 2024, Published 15th April 2024)

Abstract: *Mammary tumors are relatively common in dairy goats, negatively impacting production and farmers' economies. Irreversible loss of respective udder reduces milk yield or culling of the animals. In a current case report, A Beetal goat was presented at the UVAS surgery clinic with a udder tumor. After confirmation, a partial mastectomy was performed under general anesthesia and aseptic surgery. The neoplastic growth was resected, and surgery was completed. The overall health status of the animals was improved with an increase in milk yield during post-operative care and a follow-up period of 30 days. The surgical removal of udder tumor could be useful in small ruminants to restore udder health and milk production.*

Keywords: Mammary Tumor, Udder, Partial Mastectomy, Beetal Goat

Introduction

A tumor is a non-controlled, abnormal proliferation of cells typically surrounded by an outer layer of fibrous sheath of connective tissue or epithelium (Sinha, 2018). A benign tumor is slow-growing and often not life-threatening. It doesn't disseminate to basal membranes of surrounding tissues with no chance of recurrence after complete resection (Wang et al. 2015). Benign tumors can be consequential if they disrupt organ function. They prove drifting when putting pressure on vital surrounding structures, including blood vessels, nerves and tendons (Markopoulos et al. 2004). Benign tumors also cause hyperplasia of mammary tissues, commonly named as epithelial hyperplasia or proliferative udder disease (Andreasen et al. 1993). Uncontrolled growth of tumor cells in mammary tissues also lines the milk ducts and glands. The proliferation of a small number of tumor cells sometimes does not require treatment, but in severe conditions, surgical intervention is needed (Peaker and Walker, 1980; Arlt et al.,).

The morphological features of ruminant mammary glands are similar to those in humans and are commonly used for cancerogenic studies (Mihevc and Peter, 2013). Specific caprine neoplasms have been recorded in various case reports and a limited number of retrospective studies (Krus et al., 2023). The current case study aims to remove tumorous mass from mammary tissues by adopting partial mastectomy.

Case Description

A Beetal goat came to the University of Veterinary and Animal Sciences (UVAS) surgery clinic, Ravi Campus, Pattoki, Pakistan. The goat was presented with a history of stiff, swollen and protruded mass on the right-sided udder **(Fig. 1).** Physical examination was performed by palpating the udder, which had a hard mass with a ringed structure. Ultrasonography was performed, which showed hyper-echoic images and increased density in the swollen part of the udder (Rozear et al. 1998; Feliciano et al. 2012). Biopsy samples were sent to a lab for histopathology, confirming the presence of a benign tumor (**Fig. 3**).

Materials and Methods

The tumorous growth was treated by partial mastectomy, as described by (Cable et al. 2004). Surgery was performed under general anaesthesia following the aseptic protocols of surgery (Baines 1996). The surgical site was prepared by clipping hair around the site and scrubbing with povidone solution. The animal was anaesthetized by using a combination of Ketamine 3mg/kg (Ketasole®, Indus Pharma®, Pakistan), Atropine 1mg/kg (Atrovet®, Selmore Pharmaceuticals®, Pakistan) and Xylazine-0.1mg/kg (Xylaz®, Farvet®, Netherland) via a jugular vein (Ismail et al. 2010). The animal was put on dorsal recumbency, and the tumorous udder was exposed by a circular incision (**Fig. 2**) on the skin. The mammary artery, vein and other respective veins were ligated with a simple interrupted suture pattern using vicryl (2/0), a non-absorbable suture material. The skin suturing was done using a simple interrupted pattern with silk no. 2 (Silk®, Ethicon Inc®, Scotland), a non-absorbable suture material (Toniollo et al. 2010; Lee et al. 2000). Complete blood count was recorded at day 0 10 and 20 to evaluate general health parameters. The milk production was recorded at day 0 and followed up to 30 days post-surgery (**Fig.4).** Post-operative care was performed using povidone-iodine (Pyodine®, Brooks Pharma®, Pakistan) as an antiseptic solution, intramuscular injection of anti-biotic amoxicillin (Almox LA®, Star

[Citation: Asif, M., Rehman, F.U., Ali, M., Hussain, D., Iqbal, S., Ali, A., Nasrullah., Aziz, A., Khan, S., Jan, A. (2024). Partial mastectomy in a dairy beetal goat affected with a mammary tumor – a case report. *Biol. Clin. Sci. Res. J.*, **2024***: 792*. doi: https://doi.org/10.54112/bcsrj.v2024i1.792]

Labs®, Pakistan) with a dose of 20 mg/kg of body weight and Non-steroidal anti-inflammatory drug (NSAID), meloxicam (Dyclostar®, Star Labs®, Pakistan) with a dose of 0.5–1 mg/kg of body weight for five consecutive days.

Results and Discussion

Following general anaesthesia, the udder tumour was removed successfully by partial mastectomy, and the metastatic growth of the tumour to the normal mammary gland was restricted. The wound was completely healed after 14 days. Other udders were free from infection, and the milk yield was restored to about 50%. Incidence rate of tumor is low in dairy goats but induced serious losses like decrease in milk production, loss of udder and hence culling of the individual (Mihevc and Peter, 2013). It was observed that incidence rate of tumor is low in dairy cows, goats and sheep as compare to humans. However, their frequency is very high (58%) in developing countries (Tian et al, 2013; Mihevc and Peter, 2013). Squamous cell carcinoma was the most common epithelial tumor in goats (Gulbahar et al. 2007). In most of the cases, mammary infection is left untreated and it leads to tumor development. These tumors may proliferate to the nearby tissues and can become systemic if remain untreated. They must be subjected to surgical treatment (Peaker and Walker 1980). Many modern commercial and conventional farmers are not familiar with this surgical treatment. Moreover, lack of proper differential diagnosis of mammary tumor with cyst, hematoma and abscess leads to the culling of animals (Mihevc and Peter, 2013). Therefore, by adopting partial mastectomy, tumorous growth can be prevented, and infection can be reduced. Following partial mastectomy, the goat was followed up for 30 days. A decline in milk yield was seen for the 1st three days post-surgery. For the next follow-up period of 27 days, a a gradual increase in milk yield was seen (Fig.4). Based on history, milk production decreased from 1.5 kg to 0.5 kg per day. During the follow-up period, milk production was restored to 0.95 kg daily. These findings indicated that about 50% of milk was restored after partial mastectomy (Mlees and Elsakam, 2017).

Fig. 1: Showing Tumor Growth at Base of Udder in Beetal Goat

Fig. 2: Circular Incision to Expose the Tumor Site

[Citation: Asif, M., Rehman, F.U., Ali, M., Hussain, D., Iqbal, S., Ali, A., Nasrullah., Aziz, A., Khan, S., Jan, A. (2024). Partial mastectomy in a dairy beetal goat affected with a mammary tumor – a case report. *Biol. Clin. Sci. Res. J.*, **2024***: 792*. doi: https://doi.org/10.54112/bcsrj.v2024i1.792]

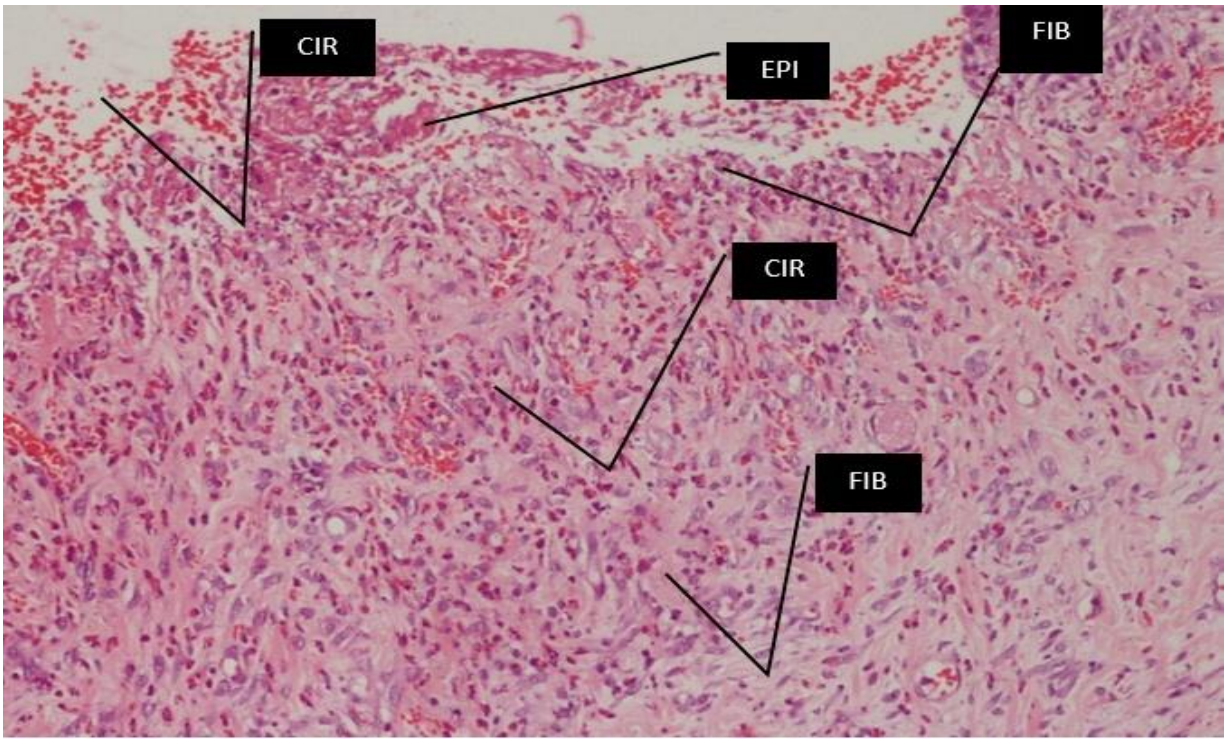

Fig 3: Presentation of tumerous growth in the udder on histopathology (Epi= epithelialisation, CIR= chronic inflammatory response, Fib= fibrosis)

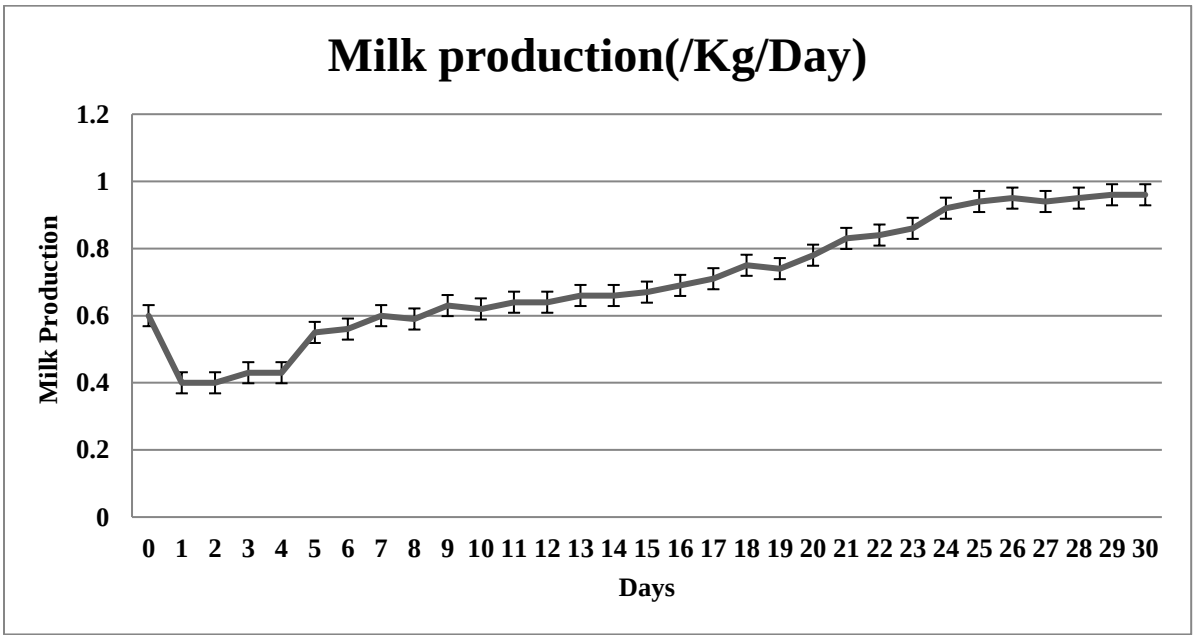

Fig. 4: Milk Production Curve after Partial Mastectomy in a Beetal Goat

Conclusion

It is concluded that milk production and suckling can be maintained after early removal of mammary tumors in dairy goats. This surgical procedure can also be applied to other animals, such as cattle and buffaloes. In this way, udder health can be maintained instead of culling the animal.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department Concerned.

[Citation: Asif, M., Rehman, F.U., Ali, M., Hussain, D., Iqbal, S., Ali, A., Nasrullah., Aziz, A., Khan, S., Jan, A. (2024). Partial mastectomy in a dairy beetal goat affected with a mammary tumor – a case report. *Biol. Clin. Sci. Res. J.*, **2024***: 792*. doi: https://doi.org/10.54112/bcsrj.v2024i1.792]

Consent for publication
Approved
Funding
Not applicable

Conflict of interest

There is no conflict of interest among the authors regarding this case study.

Author Contribution

MUHAMMAD ASIF
Conducted the surgery and wrote the case report.
FAZAL UR REHMAN
Assisted in surgery and revised the case report.
MUHAMMAD ALI, DILAWAR HUSSAIN, SHAHID IQBAL, ASIF ALI
Assisted in drafting and data analysis of the case report.
NASRULLAH, ABDUL AZIZ, SANJAR KHAN, AMAN JAN
Assisted in post-operative care and data collection of the case report.

References

Andreasen C, Huber M, Mattoon J. (1993). Unilateral fibroepithelial hyperplasia of the mammary gland in a goat. Journal of the American Veterinary Medical Association. 202(8): 1279-1280.

Arlt S, Reinecke A, Drillich M, Fischer-Tenhagen C, Heuwieser W. (2011). Inappropriate lactation syndrome in goats--case collection and experiences with mastectomy. Tierarztliche Praxis. Ausgabe G, Grosstiere/Nutztiere. 39(1): 27-32.

Baines S. (1996). Surgical asepsis: principles and protocols. In Practice. 18(1): 23-33.

Cable CS, Peery K, Fubini SL. (2004). Radical mastectomy in 20 ruminants. Veterinary Surgery. 33(3): 263-266.

Feliciano M, Vicente W, Silva M. (2012). Conventional and Doppler ultrasound for differentiating benign and malignant canine mammary tumours. Journal of Small Animal Practice. 53(6): 332-337.

Gulbahar MY, Guvenc T, Yarim M (2007). Mammary fibroadenoma in a lamb. J Vet Sci. 8(4):423–425.

Ismail ZB, Jawasreh K, Al-Majali A. (2010). Effect of xylazine–ketamine–diazepam anesthesia on certain clinical and arterial blood gas parameters in sheep and goats. Comparative clinical pathology. 19(1): 11-14.

Krus CB, Mullins C, Oman R. 2023. Goats diagnosed with neoplasia display variability in clinical presentations, treatments, and outcomes. American Veterinary Medical Association. 262(5): 1-12.

Lee KY, Halberstadt CR, Holder WD, Mooney DJ. (2000). Breast reconstruction. In. Principles of tissue engineering. Academic Press San Diego. p. 409-423.

Markopoulos C, Kouskos E, Mantas D, Kontzoglou K, Antonopoulou Z, Revenas K, Kyriakou V. (2004). Fibroadenomas of the breast: is there any association with breast cancer?. Eur. J.(iynucc Oncol.-issh). 392:2936.

Mihevc SP, Peter DO. 2013. Mammary tumors in ruminants. Acta Agriculturae Slovenica. 2(84):102.

Mlees MA, Elsaka AM. 2017. Giant Lactating Adenoma of the Breast: Safety and Benefits of Surgical Removal. Journal of Surgery. 5(3-1):56-60.

Peaker M, Walker FM.(1980). Mastectomy and mammary glands in reproductive control in the goat. Nature. 284(5752): 165-166.

Rozear L, Love NE, van Camp SL. (1998). Radiographic diagnosis; pulmonary lymphosarcoma in a goat. Veterinary Radiology & Ultrasound. 39(6): 528-531.

Sinha T. 2018. Tumors: benign and malignant. Cancer Therapy & Oncology International Journal. 10(3): 52-54.

Toniollo GH, Rodrigues V, Silva MAM, Delfini A, de Faria Júnior D. (2010). Surgical treatment of gynaecomastia in a Saanen goat. Acta Scientiae Veterinariae. 38(2): 201-204.

Wang H, Wang X, Wang CF. (2015) .Comparison of clinical characteristics between benign borderline and malignant phyllodes tumors of the breast. Asian Pacific Journal of Cancer Prevention. 15(24):10791-5.