

## Tratamento cirúrgico da ginecomastia em um bode da raça Saanen

Surgical treatment of gynaecomastia in a Saanen goat

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### ABSTRACT

**Background:** Gynaecomastia in male goats is characterized by abnormal development of the mammary gland. Enlarged udder may be observed cranially to the scrotum, which can occasionally reach the size of the testicles. The udder may carry functional glands and impair the animal's reproductive performance and welfare. The case of a successful surgical treatment of gynaecomastia in a high reproductive performance Saanen buck-goat is reported in the present study.

**Material, Methods & Results:** The animal was admitted presenting significant augmentation of the mammary glands, which was clinically diagnosed as gynaecomastia. The male goat owned optimal phenotypic characteristics for the Saanen breed, which had been producing high performance descendents. The mammary glands had been impairing the goat's locomotion and sexual performance. Manual milking resulted in great amount of milk secretion. The animal presented anorexia and impaired sexual performance. After clinical and laboratorial evaluation, the animal was submitted to radical mastectomy. An elliptic skin incision was performed around each mammary gland. Subcuticular blunt dissection was accomplished to isolate the mammarian tissue from the abdominal muscular layer and the spermatic chord. The excised mass was sampled for histological assessment. Subcuticular layer and skin closure was carried in a routine fashion. Hygienization of the surgical wound was performed with 2,5% PVP-I solution for ten days. Additionally, an association of penicillin G benzathine and streptomycin, and fluxinin meglumine were also given. The surgical procedure was successfully accomplished without any peroperative complication. The excised mass was sampled for anatomic/histological assessment. Macroscopically, the left mammary gland presented 22 cm in length, 12 cm wide and 26 cm in diameter. The right gland presented 16 cm in length, 7 cm wide and 13,5 cm in diameter. The microscopic assessment revealed hyperplasia of the glandular ducts. No abnormalities resembling malignant mammary neoplasms or degeneration were observed. At the end of the treatment, the animal was completely recovered. The animal convalesced satisfactorily and surgical wound healed completely within the first 10 days post-op. The goat was not culled and returned to normal reproductive activity. Within 12 months of follow-up, the animal was able to produce high milk yield performance progenies.

**Discussion:** This case report presented relevant aspects of the surgical management of gynaecomastia, especially to veterinary practitioners dealing with milk goats. Gynaecomastia is not as common as other reproductive disorders in domestic animals. In opposition to the findings of the present study, other trials revealed that gynaecomastia usually does not affect fertility, libido, ejaculate parameters and sexual performance of goats. However, it is important to consider that neoplastic disorders such as mammary adenocarcinoma may be present, even though these are rare complications. Last but not least, the decision making on mastectomy in the present study was crucial in order to reestablish the animal's welfare and its functionality in the farms reproduction program.

**Keywords:** Gynaecomastia, mammary gland, caprine, male, mastectomy.

**Descritores:** Ginecomastia, glândula mamária, caprino, macho, mastectomia.

## INTRODUCTION

Gynaecomastia in goats is a monogenic abnormality linked to dominant genes [2]. Enlarged udder may be observed cranially to the scrotum, which can occasionally reach the size of the testicles [1,9]. The udder may carry functional glands and hand milking may result in 25-1500 mL of milk [1,8].

Testicular tumors were described in several species as a cause of gynaecomastia [5]. The serum concentration of estrogen in patients owning tumors of the Sertoli cells are usually increased, which may lead to gynaecomastia [3].

Gynaecomastia does not seem to be a major metabolic abnormality in goat breeding. The animals do not need to be culled, as long as they produce high performance progenies [6]. However, if the mammary tissue impairs mating, locomotion or if mammary tumors are suspected, mastectomy may be indicated [10].

The aim of the present study was to report the case of a successful surgical treatment of an abnormal case of gynaecomastia in a high reproductive performance Saanen goat.

## CASE

A four-year-old male Saanen goat presenting significant augmentation of the mammary glands was admitted (Figure 1). The animal owned optimal phenotypic characteristics for the Saanen breed, which had been producing high performance descendents. The mammary glands had been impairing the goat's locomotion and sexual performance. The patient had been losing weight since it presented mammary overgrowth. The goat was submitted to clinical evaluation

and no signs of concurrent disease were identified. Hand milking produced 250 ml of milk. Blood was sampled for routine assessment, which revealed no major alterations. Serum dosage of hormones was not allowed by the owner and the treatment of choice was radical mastectomy.

After 24-hour fastening, the goat was sedated with 1% xylazine chloride<sup>1</sup> (0.5 mg/kg, intramuscularly) and clipped. The anesthetic induction was performed with an intravenous bolus of ketamine chloride<sup>2</sup> (4 mg/kg) and the anesthetic maintenance was accomplished with halothane in 100% oxygen, in 10 l/min rate, after orotracheal intubation.

An elliptic skin incision was performed around each mammary gland (Figure 2A). Subcuticular blunt dissection was accomplished to isolate the mammary tissue from the abdominal muscular layer and the spermatic chord. The excised mass was sampled for histological assessment. Subcuticular layer and skin closure was carried in a routine fashion (Figure 2B). Hygienization of the surgical wound was performed with 2.5% PVP-I<sup>3</sup> solution for ten days. Additionally, an association of penicillin G benzathine (22.000 UI/kg, 48-hour intervals, 3 administrations, IM) and streptomycin<sup>4</sup> and flunixin meglumine<sup>5</sup> (1,1 mg/kg, 24-hour intervals, 3 days, IM) were also given.

## RESULTS

Macroscopically, the left mammary gland presented 22 cm in length, 12 cm wide and 26 cm in diameter. The right gland presented 16 cm in length, 7 cm wide and 13,5 cm in diameter (Figure 3). The microscopic assessment revealed hyperplasia of the glandular ducts. No abnormalities resembling malignant mammary neoplasms or degeneration were observed.



**Figure 1.** High reproductive performance Saanen goat owning gynaecomastia. **A.** Cranial view of the mammary gland in dorsal decubency. **B.** Caudal view, in dorsal decubency.



**Figure 2.** A. Surgical field following resection of the mammary glands in a high reproductive performance Saanen goat. B. aspect of the surgical wound after skin suture.



**Figure 3.** Macroscopic aspect of the mammary gland after surgical resection in a high reproductive performance Saanen goat owning gynaecomastia.

The animal convalesced satisfactorily and the surgical wound healed completely within the first 10 days post-op. The goat was able to walk adequately after the first day post-op. The goat regained weight and presented normal food intake in the early post-op period. Normal libido was observed and copulation was possible within 15 days post-op.

Within 12 months of follow-up, the animal was able to produce high milk yield performance progenies. No other case of gynaecomastia was observed in the same breeding farm since the surgical treatment of the animal studied in the present case report.

#### DISCUSSION

The datas involving the management of gynaecomastia are sparse. This case report presented

relevant aspects of the surgical management of gynaecomastia, especially to veterinary practitioners dealing with milk goats. Gynaecomastia is not as common as other reproductive disorders in domestic animals [8].

In the present case report, the sexual performance of the animal was completely compromised due to inflammation and overgrowth of the mammary tissue. Gynaecomastia does not seem to affect fertility, libido, ejaculation parameters and sexual performance of goats. The case of a male Moxoto caprine, owning gynaecomastia that presented no functional alterations on the reproductive performance before and after total bilateral mastectomy was reported [7]. The performance tests of a buck-goat owning gynaecomastia revealed satisfactory results in other case report [10]. Such goat had produced several high milk yield progenies. Additionally, culling high performance goats owning gynaecomastia is not recommended, as long as sexual function is not impaired [6].

Concerning diagnostic tools, serum prolactin dosing may show increased levels in goats owning gynaecomastia [4]. In the present study, reproductive hormone dosing was not possible in order to confirm that data. Hormonal dosing is usually expensive and several cattle owners do not authorize it in our routine.

Conservative management of gynaecomastia involves daily drainage of the mammary gland. However, hand milking may increase the milk yield and impair the local inflammatory process [10]. In opposition, another author suggested daily mechanical drainage of the gland in order to avoid retention



mastitis [6]. The authors of the present case report recommend daily hand milking only if no severe inflammation is present.

The surgical treatment was extremely important for the animal's welfare, which had been presenting severe difficulty in locomotion due to the large size and weight of the glands. This fact was perceived in the early post operative period. The goat presented fast recovery of the sexual function 15-20 days following the surgical intervention. Total mastectomy is recommended in cases of sexual dysfunction and impairment of locomotion [8,10].

In several cases, gynaecomastia does not confer any threat to the animal's health. However, it is important to consider that neoplastic disorders such as mammary adenocarcinoma may be present, even though these are rare complications [10].

Besides the scientific value of the present study, it is important to notice that the decision making

on mastectomy was crucial in order to reestablish the animal's welfare and its functionality in the farms reproduction program.

#### CONCLUSION

Radical mastectomy improved significantly the goat's welfare, which presented satisfactory reproductive performance after surgical treatment of gynaecomastia.

#### SOURCES AND MANUFACTURERS

- <sup>1</sup>Rompun 2%®, Bayer S.A. Saúde Animal, São Paulo, SP.
- <sup>2</sup>Ketamin 5%®, Cristália Produtos Químicos Farmacêuticos Ltda., Itapira, SP.
- <sup>3</sup>Riodeine Tópico®, Rioquímica Indústria Farmacêutica Ltda., São José do Rio Preto, SP.
- <sup>4</sup>Pentabiótico Veterinário®, Fort Dodge Saúde Animal, São Paulo, SP.
- <sup>5</sup>Banamine inj.®, Schering-Plough Saúde Animal, São Paulo, SP.

#### REFERENCES

- 1 **Al Jassim R.A. & Khamas W.A. 1997.** Gynaecomastia and galactorrhea in a goat buck. *Australian Veterinary Journal*. 75: 669-670.
- 2 **Basrur P.K. & Basrur V.R. 2004.** Genes in genital malformations and male reproductive health. *Animal Reproduction*. 1(1): 64-85.
- 3 **Gill K.; Kirma N. & Tekmal R.R. 2001.** Overexpression of aromatase in transgenic male mice results in the induction of gynaecomastia and other biochemical changes in mammary glands. *Journal of Steroid Biochemistry & Molecular Biology*. 77: 11-13.
- 4 **Janett F., Stockli A., Thur R. & Nett P. 1996.** Gynaecomastia in goat buck. *Schweiz Arch Tierheilkd*. 5(138): 241-244.
- 5 **McEntee K. 1990.** Scrotum and testis: anatomy and congenital anomalies. In: *Reproductive pathology of domestic animals*. Toronto: Academic Press, pp. 224-251.
- 6 **Ribeiro S.D.A. 1997.** Anatomia e fisiologia. In: *Caprinocultura – criação racional de caprinos*. São Paulo: Nobel, pp. 23-42.
- 7 **Santos D.O., Santa Rosa J. & Simplicio A.A. 1999.** Ginecomastia em caprino da raça Moxoto. Available in: <<http://orton.catie.ac.cr/cgi-bin/wxis.exe/?IsisScript=ACERVO.xis&method=post&formato=2&cantidad=1&expresion=mfn=032677>>. Accessed in: 10/15/2009.
- 8 **Smith M.C. & Sherman D.M. 2009.** *Goat Medicine*. 2nd edn. Hobken: Wiley-Blackwell, 896p.
- 9 **Toniollo G.H. & Vicente W.R.R. 1993.** *Manual de Obstetrícia Veterinária*. São Paulo: Varela, pp. 85-87.
- 10 **Wooldridge A.A., Gill M.S., Lemarchand T., Eilts B., Taylor H.W. & Otterson T. 1999.** Gynaecomastia and mammary gland adenocarcinoma in a Nubian buck. *Canadian Veterinary Journal*. 40(9): 663-665.