

REGIONAL MASTECTOMY DUE TO MAMMARY ADENOMA IN A LABRADOR BITCH

R. Kavin^{*1}, R.M. Gowtham², T. Kavin³ and S. Pradeep⁴

Veterinary Dispensary, Devakottai, Sivangangai – 630 302

ABSTRACT

Mammary tumors are common in intact female animals. A nine year old intact, Labrador bitch was presented with a history of progressive swelling on the right inguinal mammary glands. Upon physical examination, it was tentatively diagnosed as a mammary tumor and confirmed with fine needle aspiration cytology as a mammary adenoma. A regional mastectomy was performed to remove the affected glands along with right inguinal lymph node. The bitch made an uneventful recovery with the resolution of clinical signs.

Keywords: Mammary gland, Labrador, Mammary adenoma, Regional mastectomy

Received : 20.12.2022

Revised : 24.03.2023

Accepted : 24.03.2023

INTRODUCTION

Mammary tumors are the most common tumors in intact female dogs compared to cats (Goldschmidt *et al.*, 2011). This condition is commonly observed in Poodles, Keeshonden, Boston terriers, Airedale terriers, Great Pyrenees, Samoyeds, Dachshunds, and sporting breeds (Pointers,

Retrievers, Setters, and Spaniels). Mostly occurs in middle to old aged animals (> 6 years), rarely in young animals (< 5 years). About 35 - 50 % of canine mammary tumors and 90 % of feline mammary tumors are malignant in nature. In dogs, benign tumors are benign mixed tumors (fibroadenomas), adenomas, or benign mesenchymal tumors, and malignant mammary tumors are carcinomas and carcinosarcomas (malignant mixed tumors). Among all, sarcomas metastasize more easily (Fossum, 2019). Metastasis occurs through lymphatics and dependent blood vessels to nearby lymph nodes and lungs. The other less common sites of metastasis are adrenal glands, kidneys, heart, liver, bone, brain, and

¹Veterinary Assistant Surgeon, ^{*}Corresponding author Email id: kavinlkk@gmail.com

²Veterinary Assistant Surgeon, Veterinary Dispensary, Kannippapillaipatti, Theni – 625 602

³Veterinary Assistant Surgeon, Veterinary Dispensary, Karunkanni, Nagapattinam – 611 103

⁴Veterinary Assistant Surgeon, Veterinary Dispensary, Keelasevalpatti, Sivangangai – 630 205

skin (Novosad, 2003). The exact etiology of mammary neoplasia is unknown; however, they are hormone-dependent and shall be avoided if spayed before one year of age. The incidence of mammary tumors is 0.05 %, 8 % and 26 %, if they are spayed before their first estrum, after the first estrum and after the second estrum respectively (Schneider *et al.*, 1969). Feeding of red meat and high body weight can predispose an intact/spayed female to mammary tumors (Kamble *et al.*, 2016).

In general, sexually intact dogs and cats are seven times more likely to develop mammary tumors than neutered animals. In canines, almost 50 % of malignant and 70 % of benign mammary tumors are found to be having progesterone/estrogen receptors (Rutteman, 1992). Dogs with tumors containing such receptors documented staying longer than those without. However recent documentation has found an insignificant correlation between tumor type and the presence of hormonal receptors (Toniti *et al.*, 2009). As per reports, the administration of progesterone or estrogen resulted in the development of malignant tumors in cats and benign tumors in dogs (Rutteman, 1992 and Stovring *et al.*, 1997). Dogs with benign mammary tumors are three times more likely to develop malignant mammary tumors.

CASE HISTORY AND DIAGNOSIS

A nine-year-old intact Labrador bitch weighing 30 kg was presented with the primary complaint of mass on the right inguinal region which was progressively increasing in size over a period of three months (Fig. 1). The

bitch had whelped four times earlier, and the last whelping was two years back.



Fig.1. Mass on the right caudal mammary glands

Upon physical examination, the vital parameters such as heart rate (78 beats/min), respiration (24 breaths/min) and rectal temperature (101.6° F) were within physiological limits. Palpation of the tumor revealed about 20 cm × 10 cm diameter of hard, edunculated/cauliflower-like mass with soft centre involving right caudal abdominal and inguinal mammary glands. The mass was non-ulcerated and intact, and the root was not attached to the abdominal muscles (Fig. 2). Thorax and abdomen lateral radiographs were taken. The lung fields/cardiac silhouette and abdominal serosal details were clear without any metastatic lesions (Fig. 3 and 4). Fine needle aspiration cytology of the mass revealed it as a mammary adenoma. Haematology and serum biochemistry parameters were within normal range and the surgical option was opted (Table 1).

Table 1. Haematology and biochemistry values

Hb (g/dl)	15
RBC ($\times 10^6$ cells/ μ l)	5.5
PCV (%)	29
Platelets (/ μ l)	300000
MCV (fl)	65
MCH (pg)	13
MCHC (%)	34
WBC ($\times 10^3$)	6.2
Mature Neutrophil (%)	72
Monocyte (%)	02
Lymphocyte (%)	25
Eosinophil (%)	01
Total protein (mg/dl)	6.5
Albumin (mg/dl)	5.4
Globulin (mg/dl)	2.7
Glucose (mg/dl)	112
BUN (mmol/l)	20
Creatinine (mg/dl)	0.7
ALT (U/L)	66
AST (U/L)	13



Fig. 2. Pedunculated/cauliflower-like mass with soft centre involving right caudal abdominal and inguinal mammary glands



Fig. 3. Thorax lateral radiograph showing absence of metastatic lesion

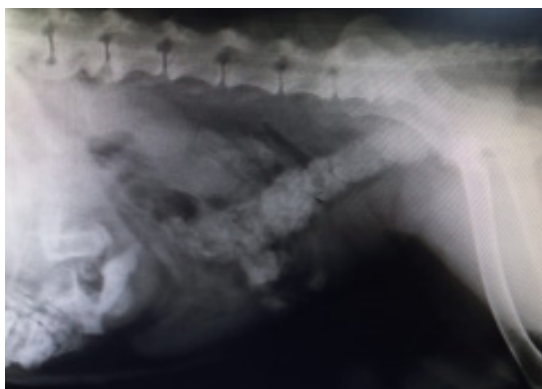


Fig. 4. Abdominal lateral radiograph - normal serosal details

TREATMENT

Food was withheld for 12 hours and water for 6 hours prior to surgery. The bitch was premedicated with buprenorphine @ 0.02 mg/kg, IM, 15 minutes prior to surgery and midazolam @ 0.2 mg/kg, IM, 5 minutes prior to surgery. Anaesthesia was induced with propofol @ 3 mg/kg titrated to effect and maintained with the same at the required top-up dose. The bitch was placed on dorsal recumbency and the surgical site was prepared aseptically. Ovariohysterectomy was performed as per standard procedure and the abdomen was closed routinely. An elliptical incision was made around the right caudal two mammary glands at the healthiest part, two centimeters away from the tumor margins. The incision was extended into subcutaneous tissues and the external abdominal wall. By careful blunt dissection, the mass was elevated from its attachments and the caudal superficial epigastric artery/vein was ligated. About 600 grams of mammary tumor was removed along with the right inguinal lymph node (Fig.5). Subcutaneous dead space was obliterated by placing walking sutures using polyglycolic acid 1-0. The skin was opposed with a horizontal mattress pattern using polyamide 2-0.

Postoperatively, injections Amoxicillin @ 20 mg/kg, IV, q12 hrs, Meloxicam @ 0.1 mg/kg, IV, q24 hrs and Tramadol @ 2 mg/kg, q12 hrs, SC were administered. The surgical site was examined routinely and was clean and dry, free from swelling and signs of inflammation. An

Elizabethan collar was advised to prevent self-mutilated injuries. Skin sutures were removed on the tenth day (Fig.6). The bitch recovered uneventfully and no postoperative complications were observed. Radiographs of the thorax and abdomen were taken four months later and no metastasis was noticed. Grossly also no recurrence was observed four months post-surgery.

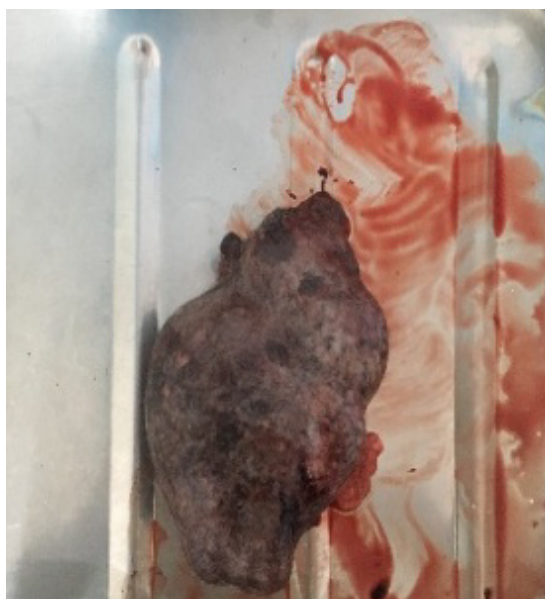


Fig. 5. Excised mammary tumor along with the right inguinal lymph node.

DISCUSSION

Mammary masses vary in size from 2–3 mm to 8 cm. The most commonly affected mammary glands were the caudal two pairs, and about 66 % of tumors had more than one mass. The majority of the masses were easily movable however, some had attachments to underlying structures such as muscles and fascia. Mammary

tumors were mostly sessile or pedunculated, solid or cystic, ulcerated or covered with skin and hair. Some “malignant” mammary tumors do not recur or spread after surgery. Papillary or tubular carcinomas have a better prognosis than solid or anaplastic carcinomas. Inflammatory carcinoma or mastitis should be suspected if the glands are diffusely swollen and poorly demarcated between normal and abnormal tissue. Inflammatory carcinomas were extremely aggressive and ulcerated, and surgery would not help in controlling their progressiveness. Axillary, inguinal and sub-lumbar lymphadenopathy were common and lameness or limb edema suggested metastasis in such cases. Weakness, anorexia, weight loss, pain in the mammary region and limbs, disseminated intravascular coagulation and thoracic metastasis were common in inflammatory carcinoma with poor prognosis (Fossum, 2019).



Fig. 6. Postoperative picture on day 10

Mastectomy or excision of the mammary glands was considered a standard protocol to remove the tumors except in inflammatory carcinomas and existing micro-metastasis (Rybicka and Krol, 2016). Based on the number of glands involved, one gland (simple mastectomy), the involved gland and adjacent glands (regional mastectomy), or an entire chain (complete unilateral mastectomy) might be excised (Novosad, 2003). The surgical technique entirely depends on tumor size, location and consistency, patient status, and surgeon preference. If complete excision of the tumors is not possible due to their massive size, then a second procedure can be performed 3 to 4 weeks after the first one. Ovariohysterectomy must be planned prior to mammary tumor resection in order to prevent tumor cells from seeding into the abdominal cavity. However, if the tumor crosses the midline, it may be removed first. OHE operated on the time of tumor removal was likely to prevent new mammary tumor development by 50 % and control hormonal influence over existing tumors (Kristiansen *et al.*, 2013). In one study, it was documented that the dogs with grade II mammary carcinoma, estrogen receptor (ER)-positive tumors/ peri-operatively increased serum estradiol had less risk of relapse when OHE was performed prior to mastectomy than the dogs which did not receive OHE (Kristiansen *et al.*, 2016).

Regional mastectomy is the excision of the affected and adjacent glands. This is usually performed when multiple tumors occur in adjacent glands in the chain or when the mass is noticed between two glands.

It is technically easier to resect the caudal abdominal and inguinal glands together than either gland alone. In this study, the right caudal abdominal and inguinal mammary glands were resected along with the inguinal lymph node to prevent tumor spread and recurrence.

REFERENCES

- Fossum, T.W. (2019). Small animal surgery. 5th edition, Philadelphia, PA, Elsevier.
- Goldschmidt, M., Pena, L., Rasotto, R. and Zappulli, V. (2011). Classification and grading of mammary tumors. *Veterinary Pathology*, **48**: 117 - 131.
- Kamble, M., Dhakate, M.S., Upadhye, S.V. and Akhare, S.B. (2016). Surgical management of mammary tumor in a dog. *Intas Polivet*, **17**: 133 - 149.
- Kristiansen, V.M., Nodtvedt, A., Breen, A.M., Langeland, M., Teige, J., Goldschmidt, M., Jonasdottir, T.J., Grotmol, T. and Sorenmø, K.U. (2013). Effect of ovariohysterectomy at the time of tumor removal in dogs with benign mammary tumors and hyperplastic lesions: a randomized controlled clinical trial. *Journal of Veterinary Internal Medicine*, **27**(4): 935 - 942.
- Kristiansen, V.M., Peña, L., Díez Córdova, L., Illera, J.C., Skjerve, E., Breen, A.M., Cofone, M.A., Langeland, M., Teige, J., Goldschmidt, M. and

- Sorenmo, K.U. (2016). Effect of ovariectomy at the time of tumor removal in dogs with mammary carcinomas: a randomized controlled trial. *Journal of Veterinary Internal Medicine*, **30**: 230 – 241.
- Novosad, C.A. (2003). Principles of treatment for mammary gland tumors. *Clinical Techniques in Small Animal Practice*, **18**(2): 107 - 109.
- Rutteman, G. R. (1992). Contraceptive steroids and the mammary gland: Is there a hazard? Insights from animal studies. *Breast Cancer Research and Treatment*, **23**(1-2): 29 - 41.
- Rybicka, A. and Krol, M. (2016). Identification and characterization of cancer stem cells in canine mammary tumors. *Acta Veterinaria Scandinavica*, **58**: 86.
- Schneider, R., Dorn, C. and Taylor, D. (1969). Factors influencing canine mammary cancer development and postsurgical survival. *Journal of the National Cancer Institute*, **43**(6): 1249 - 1261.
- Stovring, M., Moe, L. and Glattre, E. (1997). A population – based case- control study of canine mammary tumors and clinical use of medroxyprogesterone acetate. *Acta Pathologica et Microbiologica Immunologica Scandinavica*, **105**(8): 590 - 596.
- Toniti, W., Buranasinsup, S., Kongcharoen, A., Charoonrut, P., Puchadapirom, P. and Kasorndorkbua, C. (2009). Immunohistochemical determination of estrogen and progesterone receptors in canine mammary tumors. *Asian Pacific Journal of Cancer Prevention*, **10**(5): 907 - 911