Mixed mammary gland tumor in a 5 year old German Shepherd bitch

Author: Dr. Lilyan Wanjiku Mathai, BVM (UON)

J56/64630/2010

Attending clinician: Dr. Kipyegon
SUMMARY

A 15-year-old German shepherd bitch weighing 25 kilograms was presented to the University of Nairobi, Small Animal clinic with a history of an enlarging swelling on the ventral abdominal area. Upon examination, there was an ovoid subcutaneous mass measuring at approximately 3cm by 1.5cm located on the right ventral abdominal area between the 2nd and 3rd mammary gland. Physical examination showed the mass to be firm, non-ulcerated, painless and freely movable. Thoracic radiographs, ultrasonography, hematological and fluid analysis of the lesion were performed to achieve a diagnosis. Ultrasonographic examination of the mass revealed anechoic zone at the centre of the mass and hyperechoic zones spread throughout the mass suggestive of mineral deposits. A brown and hazy fluid was obtained upon centesis and culture revealed no growth. The bitch was spayed and the mass excised. Histology confirmed the mass as a mammary gland tumor.

INTRODUCTION

Mammary gland tumors are the most common tumor that occurs in dogs. Incidence rates are highest in intact bitches than males (McCarthy et al). Neutering of females prior to their first estrus reduces the incidence rate to 0.5% compared to neutering after first estrus which reduces to 8% (Zatloukal et al, 2005).

The occurrence of mammary gland neoplasia has been linked with several predisposing factors. These include; age and breed. The occurrence of mammary neoplasia in canines more than 5 years of age indicates that the incidence increases as the dog ages. Higher incidences of
mammary neoplasia in some breeds such as the Dachshund, Doberman, German Shepherd, Cocker spaniel and toy poodle.
CASE HISTORY AND MANAGEMENT:

A 25 year old German Shepherd bitch was presented to the UON, SAC with a history of a swelling on the ventral abdomen. Upon examination, there was an ovoid subcutaneous mass measuring at approximately 3cm by 1.5cm located on the right ventral abdominal area between the 2nd and 3rd mammary gland. Physical examination showed the mass to be firm, non-ulcerated, painless and freely movable. Ultrasonographic examination of the swelling was performed using a convex array probe at frequency of 6.5MHz transcutaneously. The sonogram revealed that the centre of the mass to contain fluid. Fluid was collected through centesis by desensitizing the area with 1ml of lignocaine hydrochloride and a 5ml syringe and 21G needle used to aspirate the fluid with the ultrasound probe guiding to the centre of the mass. Fluid collected via centesis was evaluated and cultured with no growth reported. The patient was scheduled for biopsy surgery to remove the mass for histopathological examination.

The patient was sedated by use of xylazine hydrochloride (Bomazine ®) at a dose rate of 1.3mg per Kilogram body weight, with a total dose of 32.5mg administered intramuscularly. The patient was then prepared for aseptic surgery by shaving the ventral abdomen and cleaned using antiseptic. 10 minutes following sedation, a 2.5% thiopental sodium solution was administered (at a dose rate of 15mg per kilogram bodyweight) with a total dose of 375mg given to effect intravenously. An endotracheal tube was then put in place to facilitate maintenance of general anesthesia using Halothane gas. Ovariohysterectomy and excision of the mass were carried out. The mass was removed by blunt dissection as it was not adhered to the abdominal wall muscles. A tension suture pattern (horizontal mattress) with nylon 2/0 and rubber tubing’s was used to close the defect. Thereafter the mass was submitted for histopathological examination. Post
operative care involved antibiotics for 7 days using long acting amoxicillin tryhidrate
(Betamox®) at a dose rate of 15 mg per kilogram body weight i.e. 375 mg on alternate days
(2.5 ml) intramuscularly. An anti-inflammatory, dexamethasone (Colvasone®) 6 mg was
administered via an intramuscular injection. Sutures were removed 10 days later. The patient was
then euthanized following the clients’ request.
Fig. 2: sonogram showing anechoic fluid contained in the swelling, a hyperechoic distal border showing the delineation of the swelling with a wall thickness of 8mm.

Fig 3: a clear acoustic shadow on the distal border of the cysts where mineral deposits are laid down. Measurements of the swelling showing an area of 10.6cm² and circumference of 132mm.
DISCUSSION

Mammary tumors are the second most common group of neoplasms in dogs, after skin tumors. They are the most common tumors in female dogs, comprising 52% of all neoplasms occurring. Of the mammary gland tumors diagnosed in female dogs, 41 to 53% are diagnosed as malignant (Munson and Moresco, 2007).

The hormonal effect due to estrogen and progesterone receptors plays a major role in the hyperplasia and neoplasia of mammary gland tissue (McCarthy et al). Other predisposing factors include the breed and age, with the incidence higher in the Dachshund, Cocker Spaniels, Toy poodle and German Shepherd breeds and above 5 years of age (McCarthy et al) (Zatloukal et al, 2005) (Rivera). Tumors can either be benign or malignant. Benign tumors only affect the single glands with no spread to other areas. Malignant tumors spread hematogenously through the lymphatics and can lodge themselves anywhere in the body with highest incidence in the lungs and liver due to microcirculation.

The classification of mammary gland tumors by the World Health Organization (WHO) is based on extent of the tumor involvement with the lymph nodes and presence of metastatic lesions. These include; carcinomas, sarcomas, carcinosarcomas and benign adenomas. Mixed mammary tumors are examples of carcinosarcomas.

Tumor classification is also classified based on the most pronounced histological pattern observed in more than 50.0% of the tumor mass. Whenever tumors displayed multiple morphological patterns, without more prominent growth pattern present in 50.0% of the tumor mass, lesions were classified as tumors with mixed morphology tumor e.g. canine mixed mammary sarcoma which is multi-differentiated with bone, cartilage and fat. The tumors involve mostly the posterior glands than the anterior glands and may occur as single or multiple nodules measuring 1-25 cm in a single or more gland. The incised surface appears lobulated, gray tan,
and firm and may often have fluid filled cyst. Mixed mammary tumors account for 50% of all canine mammary tumors (Tavasoly et al, 2013), (McCarthy et al).

Tumors may also be classified by grade. This is according to the Elston and Ellis scoring system based on the assessment of three morphological features: (1) the degree of glandular differentiation assessed by tubular formation; (2) nuclear pleomorphism, and (3) mitotic activity (Tavasoly et al, 2013).

Diagnosis of mammary gland tumors is based on the clinical signs (swellings at the gland areas) and imaging techniques. Two radiographic views are recommended to establish the presence of metastatic tissue in the lungs. Fine needle aspirates of tissue biopsies aid in confirmatory diagnosis from histological analysis. However the biopsy techniques may compromise the metastasis of the tumor through seeding of tumor cells and thus not recommended for tissue which are deeply sited.

Treatment is aimed at the removal of the tumor and abolishing the hormonal influence to the tumor. Ovariohysterectomy coupled with tumor excision is recommended for intact females. Complete removal of the tumor with a wide margin resection technique is recommended to prevent recurrence due to re-growth.

Surgical removal of the affected gland varies from simple mastectomy, modified radical mastectomy, lumpectomy, and radical mastectomy. The procedure selected will vary on the extent of tissue involvement and the nature of the tumor. The use of chemotherapeutic agents has not proven effective.

Prognosis of neoplasms is dependent on; size of tumor, lymph node involvement, nuclear differentiation and the whether a tumor is benign or malignant.
CONCLUSION

The occurrence of mixed mammary gland tumor in the German Shepherd bitch in this case report occurred due to the existing risk factors associated with mammary gland tumors. The age, breed and the reproductive state of the animal increased the incidence risk of the neoplasia. Due to the fact that the animal was a breeding animal, the ovariohysterectomy carried out led to the economic loss to the owner.

REFERENCES

Mammary Tumors In “ The Merck Veterinary Manual” 10th edition 2010 Merck and company New Jersey, USA pg 1289-1290


Rivera P. Biochemical markers and genetic risk factors in canine tumors pub.epsilon.slu.se/2280/1/rivera_p_100503.pdf Assessed on April 2013
