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CASE REPORT

Mammary gland chondrosarcoma in a German Shepherd bitch: A case report.

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INTRODUCTION

Canine mammary tumours are the most common tumours in intact bitches and they constitute about 25% of the neoplasm in this species followed by skin tumours (Benjamin *et al.,*1999) and their incidence varies from 198 to 622.6 cases per 100,000 dogs per year (Vail and MacEwen,2000). According to Yager *et al.(*1993),about 95% of them are of epithelial origin while the other 5% are mesenchymal. Sorenmo (2003) reported that half of the surgically removed mammary neoplasms in bitches were malignant. Mammary neoplasms in dogs that are similar to those in humans are of special concern to oncology researchers because they may be used as biological models in the search for more accurate diagnosis, more exact prognosis and a more efficient therapeutic procedures (Pierrepoint, 1985). Reports of this condition in indigenous Nigerian dogs have not been documented.

In this report, we present the clinical and histopathological findings associated with mammary chondrosarcoma in a 13-year old German Shepherd bitch. Based on our review of literature, extra skeletal chondrosarcoma is extremely rare when compared with other types of canine mammary tumours (Menten,2002)The tumor, measured 8cm in diameter, was located in the right caudo-abdominal mammary gland and the mass weighed 350g.It was very hard with many irregular nodular projections on the surface. Microscopically, a well differentiated chondrosarcoma of the mammary gland was diagnosed. The diagnosis of canine mammary chondrosarcoma is an uncommon occurrence in this environment.

KEYWORDS: Dog, mammary gland, chondrosarcoma

CASE HISTORY

A 13-year old, 22kg intact German Shepherd bitch was presented at the clinic with very hard mass located within the 3rd caudo -abdominal mammary gland on the right row. The owner observed the tumour as a very small growth which grew progressively within the past 9 months. The appetite was reportedly normal. The rectal temperature was 38.7^{0}C.There was no superficial lymphadenomegaly. The packed cell volume (PCV),Haemoglobin (HB) Mean corpuscular volume (MCV) and Mean corpuscular haemoglobin concentration (MCHC) were all within the reference interval (i.e. 39%, 15g/dl,69fl,and 34g/dl)respectively. (Reference values being 37-55%;12-18g/dl;60-77fL and 32-36g/dl respectively) The leukogram did not show any significant deviation from normal. Total White Blood Cell count was 12x10^3 /uL; segmented neutrophil was 8x10^3 /uL; band neutrophil was 0.3x103/uL; Lymphocyte was 2x10^3/uL; monocytes was 0.8x10^3/uL and eosinophil was 0.5x10^3/uL. (Compared with reference values 5x10^3/ul-14x10^3/ul;2.9x10^3/ul-12x10^3/ul;0.0-

$0.45x10^3$/ul;$0.4\text{-}2.5x10^3$/ul;$0.1\text{-}1.4x10^3$/ul;$0.0\text{-}1.3x10^3$ /ul for total WBC, segmented neutrophils, band neutrophils, lymphocytes, monocytes and eosinophils respectively) Fine Needle Aspiration Biopsy of the mass was not diagnostic because the mass was too hard for the needle to penetrate properly. The mass was thereafter surgically excised and submitted for detailed **Figure 1:** showing the mass grosslyhistopathology.

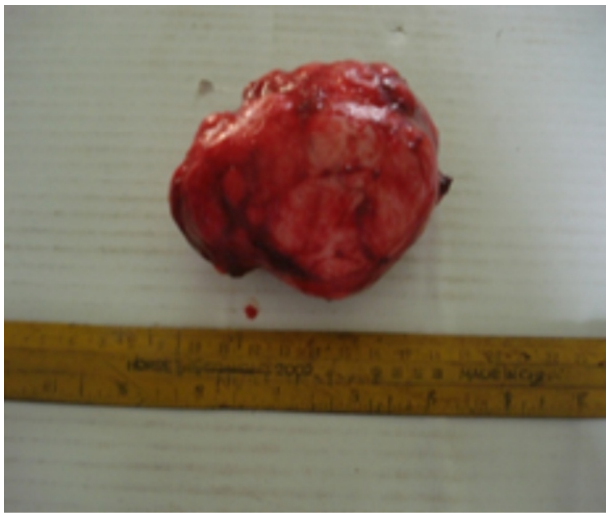

Figure 1: showing the mass grossly

GROSS FINDINGS

The mass was very hard, irregularly shaped and pendulous. It weighed 350 g and measured 8cm in diameter. (Figure 1).The surface was markedly rough and nodular and the overlying skin was not ulcerated. The incised surface was white and a wide cavity was present. (Figure 2).The cavity contained cream-yellow gelatinous fluid. There were numerous irregularly arranged, white, thorny projections within the cavity.(Figure 3).Tissue samples were obtained from the mass, fixed in 10% buffered formalin, processed routinely, sectioned and stained with haematoxylin and eosin (H&E)

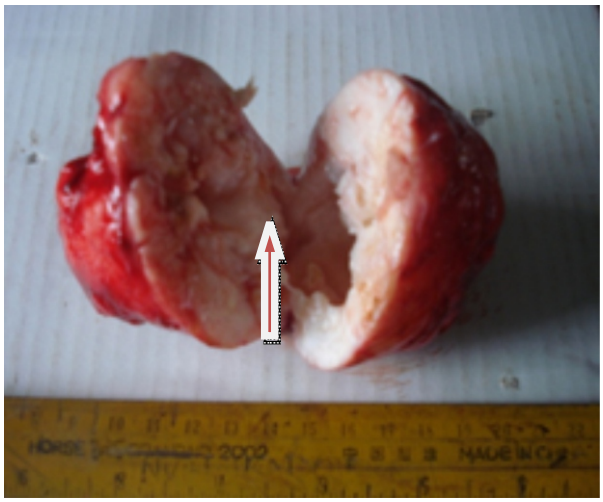

Figure 2: arrow showing the cavity within the mass

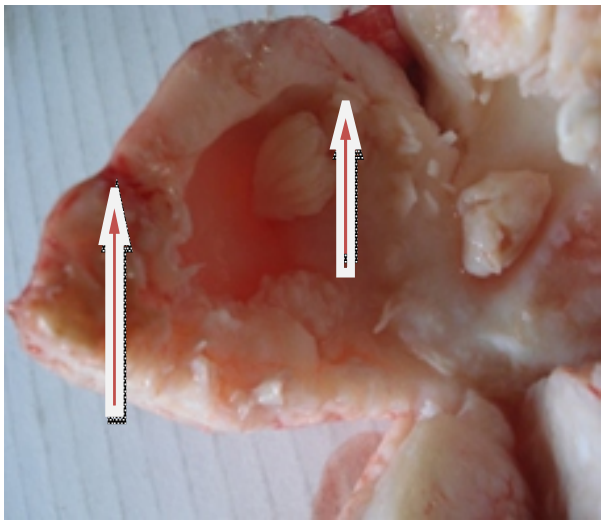

Figure 3: arrow showing the thorny projections

HISTOPATHOLOGICAL FINDINGS

The tumour was lobular and was surrounded with thick band of fibrous capsule. There were numerous chondroblasts in the lacunae with moderate basophilic cytoplasm. These cells were monomorphic and pleomorphic. Most of the nuclei were hyperchromatic. There was anisocytosis and anisokaryosis. Mitotic figures were not evident. (Figure 4)

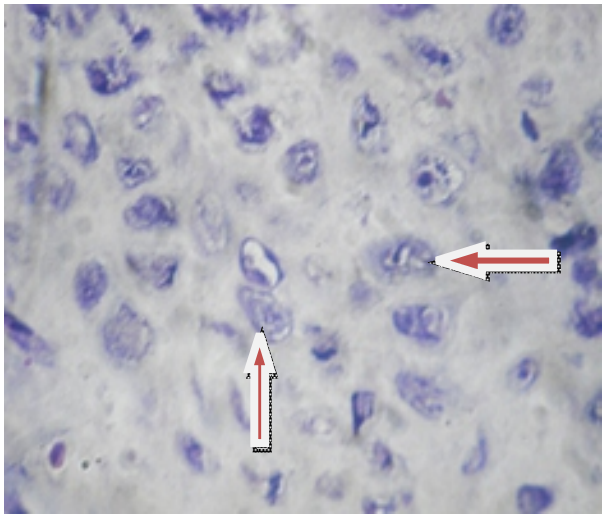

Figure 4: (H&E) x 400 showing Monomorphic chondroblasts. There is anisocytosis, anisokaryosis and moderate cytoplasmic basophilia

Histopathologically, the tumour was diagnosed as a well differentiated extra skeletal canine mammary chondrosarcoma.

DISCUSSION

Mammary neoplasms are the second most common tumour type reported in female dogs after skin tumours (Johnston *e tal,*2001).According to the World Health Organization (WHO),canine mammary tumours can be derived from epithelial cell types e.g. adenocarcinoma, connective tissue cell types, e.g. sarcomas or lipoma or a mixture of cell types, e.g. mixed mammary tumours. Malignant mammary neoplasms often have a poor prognosis due to high rate of reoccurrence as well as metastasis. The incidence of any type of mammary tumour has also been correlated with age. Bostock, (1986) reported a marked increase in the incidence of mammary tumour in dogs with increasing age with a peak at 11 years followed by a decline thereafter. The current case of chondrosarcoma in a 13- year old German shepherd bitch is a reinforcement of this previous finding. Canine mammary tumours occur clinically as either single or multiple nodules and if multiples, can be of the same or different histological types. Grossly, they vary from well circumscribed nodules stationary growth to large and sometimes ulcerated nodules which grow rapidly and become fixed to adjacent tissues (Kumar *et al.,* 2010).The diagnosis of canine mammary tumour may be based on the history, clinical signs and fine needle aspiration biopsy (Hellmen and Lindgren,1989).However, histopathological studies of formalin fixed tissues is necessary for accurate diagnosis.(Allen *et al.,*1986).Malignant Canine mammary tumour occur more frequently than benign ones (Brodey *et al.,*1983).However, the extra skeletal forms of Chondrosarcomas, as in the present case, are extremely rare in dogs (Meuten,2002).The cause of these tumours are not known but they may originate from populations of primitive multipotent mesenchymal cells which are able to differentiate into cartilage (Romanucci *et al.,* 2005)

In conclusion, more researches in the area of prevalence study and pathology of canine mammary neoplastic conditions in our environment should be undertaken. Also, because the pathology of mammary gland tumours in dogs is similar to that of humans ,it is strongly advocated that dogs are considered as natural animal model of human breast cancer research especially for testing new drugs and development of prophylactic and therapeutic measures (i.e. one health approach) to curb the menace of human cancer pandemic. This demands more concerted effort in the area of multidisciplinary research and appropriation of adequate resources to combat the scourge of breast cancer epidemic among human population.

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