CANINE METASTATIC MAMMARY CARCINOMA IN LUNGS: A CASE REPORT

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Introduction

Mammary gland tumors are one of the most frequently diagnosed neoplasms in bitches, exhibiting a high incidence of malignancy and a high degree of metastasis affecting several other tissues (Morris et al., 2002). In addition, they account for almost 50% of neoplasm in bitches. The average age at the first clinical evidence is 10 years old, with no predilection for the breed of the bitch (Munson and Moreesco, 2007). Canine mammary tumors have a complex pathogenesis, including susceptibility of bitches to their own endogenous sexual steroids (German AJ, 2006), environmental contaminants to which dogs are commonly exposed such as allethrin, cyhalothrin, cypermethrin, deltamethrin and tetramethrin (Andrade et al., 2010), and diet and hormonal components related to obesity.

Malignant canine mammary tumors are characterized for presenting an aggressive inflammatory pattern, particularly in the case of carcinoma, it behave as highly aggressive and have a low survival rate. They exhibit unlimited growing capability, and are capable to infiltrate regional lymph drainage and nodes and to cause metastases to other tissues (8). Several studies have reported the incidence of canine mammary tumors: In a report in which 672 Beagle bitches were evaluated, authors found that 71% frequency of mammary tumors, 19% of these were carcinoma and most of the dogs showed a high frequency of metastasis to lungs (Welch, 2007).

Lymph drainage is considered as one of the most important route for dissemination of mammary tumor metastasis in dogs. Canine tumors that induce formation of new lymph vessel have a higher metastasis potential (Patsikas et al., 2006). Because lung metastasis are responsible for 25% to 50% of total MCMT metastasis, it is important to perform radiographic evaluation of bitches suffering from MCMT on a routine basis, as well as cytologic evaluation by fine needle puncture and evaluation of hepato-renal function. When a non-cavitary interstitial lung pattern at radiography is observed in bitches suffering from MCMT, it would probably reflect the presence of lung metastasis which originated from mammary tumors. Accordingly, the clinical prognosis for bitches affected by mammary tumors will depend on the histological pattern of the tumor they suffers, as well as its infiltrating and metastatic capability, characteristics that must be determined by an accurate clinical exam combined with a radiological and histopathological diagnosis. It is also important to consider assessment of the estrogen and progesterone receptor expression (Chang et al., 2009). This paper reports the case of canine mammary carcinoma metastasis to lungs in a dog.

Materials and methods

A 16 year old female Cocker Spaniel dog was presented for postmortem examination to the Department with a history of recurrent mammary tumor and partial paralysis. Kidney function test revealed elevated levels of creatinine and BUN (Creatinine: 8.48 mg/dl, BUN: 150.38 mg/dl). Dog showed cachexia and
anorexia before death. Detailed necropsy was conducted and gross lesions were recorded. The affected tissue sample were collected in 10% formalin, processed and embedded in paraffin blocks. Section of 5 μm were taken on slides and stained with haematoxylin and eosin (Culling, 1963).

Result and discussion

Clinical signs observed before death was emaciation and labored breathing.

On necropsy, external examination of dog revealed pale mucous membranes and multiple wart like growths were noticed on forelimbs, hindlimbs, ventral abdomen, commissures of mouth and around the eyes. Multiple growths were noticed on caudal pair of mammary gland measuring approx. 4 x 3 cm in size (Fig.1).

Grossly, there were areas of emphysema and atelectosis in lungs. In addition to this, Multiple, White, metastatic nodules of mammary carcinoma (Fig. 3 & 4) were noticed on both the lobes of lungs measuring approx. 0.5 x 1 cm in size. Multiple growths were noticed on the surface of the spleen (Fig 2).

The present findings are in accordance with the observation of Gomez et al., 2012 in which they reported that lung metastases is characterized by a structured interstitial pattern, non-cavitary, characterized by the presence of multiple nodules of approximately 5-6 mm diameter.

Stomach showed hemorrhages on the mucosa and there were streaks of hemorrhages noticed on the intestinal mucosa. Mild myocarditis. Liver was enlarged and congested; cut section showed blood tinged exudates. Kidneys were pale, contracted, puffy and capsule peeled off with difficulty. On section appeared empty. White focal areas were noticed on the cortical surface of the kidney; multifocal depressed areas were noticed on the surface.
Patches of hemorrhages were noticed on cut section. Cyst was noticed on perirenal region. Bladder was distended with urine and mucosa showed thickening and ecchymoses. Cortical surface showed white focal areas. Other visceral organs did not show significant changes. These lesions observed in the present investigation are non specific and could be due to secondary complication of canine mammary carcinoma.

Mammary gland adenocarcinoma was noticed from multiple growths on the skin of inguinal region. (Fig.6). Liver showed diffuse distortion of hepatic cords, hemosiderosis, edema, multifocal hemorrhages, multifocal perivascular fibrosis (periportal cirrhosis). Kidneys showed diffuse cystic dilatation of the tubules, degeneration of the tubules, multifocal atrophy and disappearance of glomeruli and diffuse increase in bowman’s space at glomeruli.

Histopathological examination of lung revealed multifocal areas of infiltration of carcinomatous cells in the interstitial tissue (Fig.7 & 8). Spleen showed multiple areas of accumulation of carcinomatous cells in the red pulp.

Gomez et al., 2012 reported that most of the mammary glands affected by neoplasm (83.74%) exhibited histopathological findings of malignancy, mainly carcinoma (81%) and frequently metastasized to lungs. This is in agreement with our findings. Lockett (2005) stated that the frequency of malignant mammary tumors was 68.1%, from which 58.6% of tumors were diagnosed as carcinoma. Similarly, other authors found a predominant diagnosis of carcinoma in bitches affected by mammary tumors (Bronden et al., 2010 and Clemente et al., 2010). On the contrary, Meuten, 2002 and Dobson, 2003 found out that the predominance of benign mammary tumors was 60% to 40% whereas the malignant
mammary tumors were 30%-40%. This is in contrast with the present findings.

Summary
Mammary tumors are the second most common group of neoplasms in dogs, following skin tumors. They are the most common tumors in female dogs and common cause for the death of old age bitch. Even though there are treatments options available for mammary gland tumors, still there is recurrence of tumors and metastasis to other vital organs are the most common complications. This communication is an attempt to record the unique case of metastatic carcinoma in lungs and its histopathological features in dogs.

References