

# OCCURRENCE OF CANINE MAMMARY TUMOURS

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The study conducted in thirty clinical cases of canine mammary tumour patients revealed that Spitz was the mostly affected breed and the age group was 7- 9 years. Incidences were more with non spayed dogs and 4<sup>th</sup> and 5<sup>th</sup> mammary glands were mostly involved. Out of thirty cases of mammary tumour presented in present study, one was male and 9 cases (30%) had multiple growths and 21 cases (70%) had solitary growths. Recurrence were recorded in 4 (13.33%) cases where as, first time occurrence were 26 (86.67%). Histopathologically, 16.67% were benign and 83.33% were malignant tumours diagnosed.

## Introduction

Mammary tumor is the most common malignant tumours account for approximately 50% of all neoplasms in female dogs (Brody *et al.*, 1985). Annual incidence of canine mammary tumours (CMT) was 205 per 10,000 female dogs (Dobson *et al.*, 2002). The highest occurrence of CMT cases was found in the dogs aged 8 to 12 years (49.21%) (Srivastava *et al.*, 2009<sup>2</sup>, Dharmi *et al.*, 2010). Sex wise incidence of CMT is uncommon in male dogs, but the most common tumour of female dogs. Benjamin *et al.* (1999) reported mammary neoplasms in two male dogs. Maiti *et al.* (2013) reported seven male dogs with clinically and histologically confirmed mammary gland tumours. Canine mammary carcinoma is the most common cancer among female dogs and is often fatal due to the development of distant metastasis (Srivastava *et al.*, 2009<sup>1</sup>, Maiti, 2010; Pang *et al.*, 2011). The mean age of histopathologically diagnosed mammary tumors was 7.9 years in Boxers and 7.8 years in Springer spaniels, compared with 8.8 years in all other breeds (Moe, 2001). As with human, incidence increases with age, and at 6, 8 and 10 years, 1%, 6% and 13% respectively of dogs across all breeds report at least one mammary tumour (Cadieu and Ostrander, 2007).

## Materials and Methods

The study was carried out in thirty (30) client owned dogs presented to the Referral Veterinary Polyclinics of Indian Veterinary Research Institute, Izatnagar with the history of spontaneous mammary tumours (Fig.1 & 2) during the period from March 2009 to April 2011. The data pertaining to breed, age, sex, tumour location, appearance of tumour mass, spaying status and histological findings were collected as part of the clinical examination. Histological examination was done by collecting tumour samples (biopsy/surgically excised) and fixed in 10% neutral buffered formalin. These formalin fixed tumour samples were processed routinely by paraffin embedding technique. Sections of 4- 5 micron ( $\mu$ ) thickness were cut and stained by haematoxylin and eosin (H&E) for histological examination. Histopathology of the resected tumour mass was performed as per Luna (1972). For the analysis of tumors it was used the classification mentioned by Misdorp *et al.*(1999).

## Result and Discussion:

Dogs have 5 pairs of mammary glands, (cranial thoracic, caudal thoracic, cranial abdominal, caudal abdominal and inguinal). In the present study, maximum cases were recorded in Spitz (40%) followed by German shepherd (23.33%), non-descript (16.67%), Doberman (6.67%), Pomeranian (6.67%), Rottweiler and Labrador (each

3.33%) (Fig.3). Mammary tumour can occur in dogs irrespective of their breed. Mammary tumours were recorded mostly in pure

breeds (83.60%) especially in Spitz (33.33%) followed by German shepherd (31.37%) and Doberman (17.65%) Kumar *et al.* (2011).



Fig 1 & 2: Intact canine mammary tumours

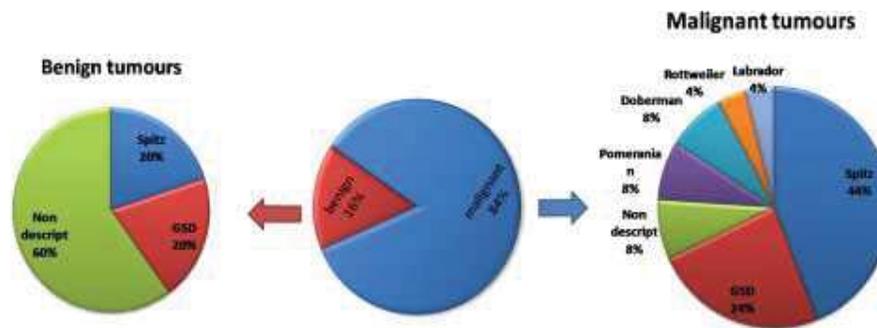


Fig. 3: Breed wise occurrence of Canine Mammary Tumours

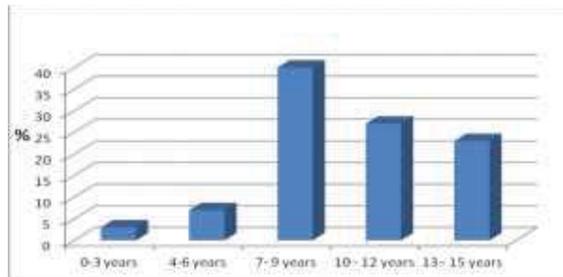
In this study, it was seen that the incidence of canine mammary tumours was more with non spayed dogs 23/30 (76.67%) than spayed dogs 7/30 (23.33%). A better prognosis in dogs that are spayed at the time of surgical removal of the tumour mass has been reported by Chang *et al.* (2005). Out of thirty cases of mammary tumour presented in present study, 9 cases (30%) had multiple growths and 21 cases (70%) had solitary growths. Multiple growths in canine mammary tumours were less (46.67%) when compared to solitary growth (53.33%) also reported by Manikandan (2007). Pedunculated growth were 12/30 (40%), and 18/30 (60%) growths were sessile. Khimta (2007) also reported comparatively less

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incidence of pedunculated mammary tumours (20.69%) and relatively higher incidence for sessile growth (79.31 %). In this study, ulcerated and inflamed were 36.67 % (11/30) and non infected were 63.33% (20/30). Manikandan (2007) reported 26.67% ulcerated and 73.33% non ulcerated canine mammary tumours. The surface of tumour was nodular in eight cases. Recurrence were recorded in 4 (13.33%) cases where as, first time occurrence were 26 (86.67%). The recurrence was also reported by Stratmann *et al.* (2008). They opined that time from 1<sup>st</sup> surgery and occurrence of a new tumour ranged from 1 to 60 months.

The present study revealed that the age of the animals affected ranged from 2 to

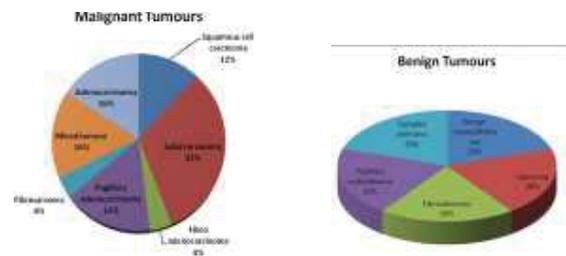
15 years. Maximum cases were recorded in the age group of 7- 9 years (40%) followed by 10-12 years (27%), 13-15 years (23%), 4-6 years (7%) and 0-3 years (3%) in that order (Fig.4). The incidence of tumours increases after the 5<sup>th</sup> year of age with a peak at the age of 10-12 years and subsequent decreases (Cohen *et al.*, 1974). In the present study, the incidence of mammary tumours was less below six years of age. Tumors of the mammary glands were most common in 6 – 14 year old bitches (Shafiee.*et al.*, 2013).The present study showed that the higher occurrence of CMT in female than males. Out of total 30 CMT cases studied, 29 (96.67 %) were females and remaining was male (3.33%). These results are in agreement with Mulligan (1975) reported out of 120 cases of mammary cancer 117 (97.50%) were female



**Fig.4: Age-wise occurrence of canine mammary Tumours**

Out of thirty cases, 25 were malignant (83.33%) and 5 were benign (16.67%) (Fig.5). The benign mammary neoplasms recorded were adenoma, fibroadenoma, papillary cyst adenoma complex adenoma and benign myoepithelioma. The malignant mammary tumours recorded were squamous cell carcinoma, adeno carcinoma, fibro adeno carcinoma, papillary adenocarcinoma, fibrosarcoma, mixed tumour and solid carcinoma (Fig. 6). Stratmann *et al.* (2008) histologically studied 99 cases of CMT and

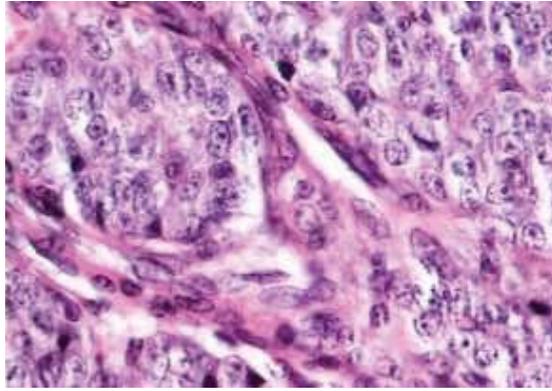
dogs and only two were male dogs (0.83%). Affected male dogs usually have a hormonal imbalance (Moulton, 1999). Rutteman *et al.* (2000) also reported that mammary gland tumours in male dogs, but the incidence were 1% or less. In the present study, it was seen that the mammary tumours affections for single gland was 21/30 (70%) out of which, 5<sup>th</sup> mammary gland alone was found to be more affected 12/30 (40%). There was 3/30 (10%) affection for 4<sup>th</sup> gland alone, 4/30 (13.33%) 3<sup>rd</sup> gland alone and 2/30 (10%) 2<sup>nd</sup> gland alone. The reason for this is that the posterior glands are having greater volume of glandular tissue to react any carcinogenic stimulus (Page, 2001; Maiti *et al.*, 2011). Higher incidence for Inguinal and (60%) and abdominal (27%) mammary glands were reported by Shafiee.*et al.* (2013).



**Fig 5: Histopathological distribution of mammary Tumours**

reported 26 (26%) benign and 73 (74%) malignant. Malignant canine mammary tumours were more frequent than benign ones were also reported by Reddy *et al.* (2009), Srivastava A. and Shrivastava A.K, (2010).Tavasoly *et al.* (2013) reported, 86.5% (n = 32), and 13.5% (n = 5) of mammary tumors were carcinomas and sarcomas, respectively.

Histologically characterized by solid sheaths of neoplastic cells arranged in the forms of islands with small amounts of stroma with large number of mitotic figures.



**Fig. 6. Solid mammary carcinoma (H & E, 400X)**

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