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## Epidemiology of canine mammary gland tumours

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### Abstract

The present study was carried out with objective to record the epidemiology of mammary gland tumours in dog presented at Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Kamdhenu University, Anand during the period of May 2021 to April 2022. A total of 105 cases of different neoplastic conditions were reported during the period of May 2021 to April 2022, Out of these cases, 37 cases were diagnosed as canine mammary tumours. Among them, 19 clinical cases referred to the Department of Veterinary Surgery and Radiology, Anand. Among them, highest incidence of mammary gland tumours found in 8 to 12 years of age groups. Amongst the breeds, highest number of mammary tumours was observed in Labrador Retriever. Inguinal pair of mammary gland found increased frequency of mammary gland tumours.

**Keywords:** Epidemiology, mammary gland tumors, canine, veterinary surgery, Labrador retriever

### Introduction

Cancer is a disorder distinguished by uncontrolled division of cells and the ability of these cells to spread into adjacent tissue. Cancer is a major cause of mortality in canines. It is the second leading cause of death next to cardiovascular disease in pet animals. Incidence of tumours is the highest in canines compare to other species (Chandravathi *et al.*, 2014) [2]. Cancer may affect at all ages, but increase age leads to increase risk for development of cancer. Bitch have 5 pairs of mammary glands. Mammary gland tumours are more common in unspayed and middle-aged bitches and between 8 to 10 years of age are more commonly affected by mammary tumours. Mammary gland tumours rarely occurred in male dogs. The present study was aimed to know incidence of canine mammary tumor regarding age, breeds, sex, involvement of mammary gland, reproductive status of canine patients.

### Materials and Methods

The present study was undertaken in 19 clinical cases of Canine Mammary Gland Tumours (CMGT) presented at the Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Kamdhenu University, Anand during the period of May 2021 to April 2022 for surgical management. To know the epidemiological status of mammary gland tumours, the particulars regarding breed, age (0 to < 4 years, > 4 to < 8 years, > 8 to < 12 years and above 12 years), sex (male, female) and reproductive history like neutering and pseudopregnancy were also collected and analyzed.

### Results and Discussion

#### Overall Incidence

A total of 105 cases of different neoplastic conditions were reported during the period of May 2021 to April 2022 at the Veterinary Clinical Complex, Kamdhenu University, Anand. Out of these cases, 37 cases (35.23 %) were diagnosed as canine mammary tumours. Among them, 19 clinical cases referred to the Department of Veterinary Surgery and Radiology, Anand.

### Age Wise Incidence

Out of 19 dogs presented with mammary tumours, the occurrence of mammary tumours was the highest in age group of 8 to 12 years (11 cases, 57.89 %) followed by 4 to 8 years of age group (7 cases, 36.84 %) and 1 case (5.26 %) in above 12 years of age group whereas, no case was reported below 4 years of age. Similar findings was observed by Silva *et al.* (2019)<sup>[9]</sup> who found 157 cases of mammary gland tumours in dogs older than 8 years out of total 238 mammary gland tumour cases. According to Witsch *et al.* (2010)<sup>[10]</sup> aging results in a greater probability of genetic mutations and accumulation of tumourigenous factors that leads to increase probability of development of mammary gland tumour in advance age.

**Table 1:** Age wise incidence

Age (years)	Number of cases	Percentage (%)
0 to < 4	0	0
> 4 to < 8	7	36.84
> 8 to < 12	11	57.89
> 12	1	5.26
Total	19	100

### Breed Wise Incidence of Canine Mammary Tumours

Out of 19 cases of canine mammary tumours, 7 cases (36.84%) were observed in Labrador Retriever followed by Doberman Pinscher, German Shepherd, Pomeranian were equally affected 3 cases in each (15.78 % in each), 2 cases (10.52 %) in Rottweiler and 1 case (5.26 %) in Mongrel. Based on these findings of it can be predicted that pet owners prefer a particular breed based on its popularity in that region. Therefore, the numbers of breeds in different geographical areas vary, reflecting the breed variation in the incidence of different disorders, including mammary tumours.

**Table 2:** Breed wise incidence

Sr. No.	Breed	Total	
		Number of cases	Percentage (%)
1	Labrador Retriever	7	36.84
2	Doberman Pinscher	3	15.78
3	German Shepherd	3	15.78
4	Pomeranian	3	15.78
5	Rottweiler	2	10.52
6	Mongrel	1	5.26
	Total	19	100

### Sex Wise Incidence

In present study, all cases of canine mammary tumours were recorded in female dogs. The similar finding was observed by the Arshi (2016)<sup>[1]</sup> and Devarathnam *et al.* (2021)<sup>[3]</sup>.

### Incidence According to Site of Occurrence

Total 24 mammary tumour masses were found in 19 cases of canine mammary tumours. Among them, 15 cases (62.50 %) had only one gland involvement while 4 cases (16.66 %) had two gland involvements. The highest incidence of mammary gland tumour was observed in inguinal glands (8 cases, 33.33 %) followed by in caudal abdominal glands (6 cases, 25.00 %). The cranial abdominal and caudal 35 thoracic glands were equally affected (4 cases and 16.66 % in each). The lowest incidence of mammary tumours was observed in cranial thoracic glands (2 cases, 8.33 %). Similar findings were observed by Devarathnam *et al.* (2021)<sup>[3]</sup> and Sarkar *et al.* (2021)<sup>[8]</sup>. Inguinal pair of mammary glands were more

prone to trauma so, development of mammary tumour was most frequently in inguinal pair of mammary glands compare to other pair of mammary glands (Rutteman *et al.*, 2000)<sup>[7]</sup>.

**Table 3:** Site distribution of canine mammary tumours in different breeds of dogs

Sr. no.	Gland affected	No. of tumour mass	Percentage (%)
1	Cranial thoracic (1 <sup>st</sup> pair)	2	8.33
2	Caudal thoracic (2 <sup>nd</sup> pair)	4	16.66
3	Cranial abdominal (3 <sup>rd</sup> pair)	4	16.66
4	Caudal abdominal (4 <sup>th</sup> pair)	6	25.00
5	Inguinal (5 <sup>th</sup> pair)	8	33.33
	Total	24	100

### Reproductive Status of Patients

Out of 19 cases, only 1 case was neuter and remaining 18 cases were intact. A neutered Labrador Retriever female spayed before the 4 months of development of mammary tumour. Panchkhande *et al.* (2019)<sup>[6]</sup> suggested that the intact bitches were more at risk of development of mammary tumours due to hormonal dependency of proliferating neoplastic cell.

Out of 19 cases, 1 intact female Dobermann pinchers showed clinical signs of pseudopregnancy. While remaining 18 cases had a no history regarding pseudopregnancy. Silva *et al.* (2019)<sup>[9]</sup> observed that abnormal reproduction cycle, high prolactin level and pseudopregnancy lead to development of mammary tumours in female dogs. Gobello *et al.* (2001)<sup>[4]</sup> suggested that development of mammary gland neoplasia in the case of pseudopregnancy might be due to the continuous mechanical distension of glandular tissue and accumulation of carcinogenic products within the mammary acini that caused by the production and retention of milk.

### Conclusion

Canine mammary gland tumours most commonly occur between 8 to 12 years of age groups with Labrador Retrievers was commonly affected breeds. CMGT occur most frequently found in non-spayed female dogs. The inguinal pair of mammary glands were more prone to develop CMGT.

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