SHORT COMMUNICATION

Ubiquity of Neoplasms in Canines of Mumbai Region

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Abstract

Neoplasia is common in pet dogs, but the literature documented on its incidence is sparse. The purpose of this study was to document the occurrence of tumours in a defined population of Mumbai and nearby regions. Fifty cases of canine confirmed neoplasm were considered in this research database. The tissue samples were collected during surgery and processed for the histopathological examination and were classified accordingly. During the collection of tissue samples, the age, sex and breed of the respective canines were also recorded. The occurrence of adenocarcinoma was highest (26%) and majority of affected canines were female. The Mongrel (non-descript) dogs were most commonly affected with a prevalence of 52% and the average age of dogs having tumour was 7.00 years.

Keywords: Adenocarcinoma, Canine, Mammary gland, Prevalence, Tumour.

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Introduction

Cancer is an important disease in pet dogs. Recent studies have shown it to be one of the major causes of death in insured dogs in Sweden. There is a large amount of clinical information on the diagnosis and therapy of different types of neoplasia and some information on risk factors for different cancers (McCormack and Boffetta, 2011). However, there is little update available on the incidence of different types of cancer in the canine population anywhere in the world. Neoplasia is the uncontrolled, abnormal growth of cells or tissues in the body, and the abnormal growth itself is called a neoplasm or tumor. The word "cancer" is often confused with neoplasia, but only malignant neoplasm is truly a cancer. Malignant tumors are a pathological hypobiosis, the etiology and pathogenesis of which are not sufficiently clarified. Cancer is rather a consequence of many factors, which are active in a certain period of time and the significance of risk factors in the development of cancer is based on their ability to influence the genes inside the cells (Lyman, 1992).

The most commonly found tumours in dogs and cats are mammary gland tumors followed by skin tumors, osteosarcomas and leukemias. The global burden of cancer is projected to increase from 13.3 to 21.4 million incident cases between 2010 and 2030 due to demographic changes alone, dominated by a growing burden in low- and middle-income countries like India (McCormack and Boffetta, 2011). As compared to human, in canines neoplasms are more frequent (Dhami *et al.,* 2010). Tumours in dogs are multifactorial conditions, which include the participation of sex hormones, genetic, oncogenic viruses, immunological factors, environmental factor, and environmental carcinogens (Roshini *et al.,* 2013). This study focuses on the ubiquity of neoplasms in canines of Mumbai region.

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Materials and Methods

A total of 50 neoplastic canine cases presented at Bombay Society for Prevention of Cruelty in Animals Hospital, Parel during May to August 2021 were included in the study. A detailed history about the animals was obtained from the respective owners, and a thorough physical examination was performed. Samples were collected after the completion of surgical intervention, physically examined and analyzed, then placed in 10% neutral buffered formalin for histopathological evaluation using standard procedures (H&E staining). The tumors were histologically classified and graded. Interrelationship in context to prevalence of tumors for breeds, age and sex of the animals was worked

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out based on the confirmatory diagnosis of 50 cases upon histopathological findings.

Results and Discussion

The prevalence of different types of neoplasms is presented in Table 1. Among 50 cases of confirmed canine neoplasm, the occurrence of adenocarcinomas, especially of mammary gland (Plate 1) was highest (26%) followed by adenoma (14%) (Plate 2), fibrosarcoma (10%) (Plate 3), lipoma (10%) (Plate 4), transmissible venereal tumor (8%) (Plate 5), pilomatrixoma (6%) (Plate 6), round cell tumor (6%), epulis (4%) (Plate 7), hamartoma 4%, fibroma 4%, mast cell tumor (2%) (Plate 8), transitional cell carcinoma (2%) (Plate 9), rhabdomyoma (2%) (Plate 10) and histiocytoma (2%). The current findings are supported by the studies of Roshini *et al.* (2013) and Sharma *et al.* (2018). They have also found the same kind of incidence, with the highest of mammary gland adenocarcinomas.

Table 1: Classification of tumours on the basis of their histological type (n=50)

Types of tumours	Number & % of animals affected
Adenocarcinoma	13/50 (26.0 %)
Adenoma	7/50 (14.0 %)
Fibrosarcoma	5/50 (10.0%)
Lipoma	5/50 (10.0 %)
Transmissible veneral tumour	4/50 (8.0 %)
Pilomatrixoma	3/50 (6.0 %)
Round cell tumour	3/50 (6.0 %)
Hamartoma	2/50 (4.0 %)
Fibroma	2/50 (4.0 %)
Epulis	2/50 (4.0 %)
Mast cell tumour	1/50 (2.0 %)
Transitional carcinoma	1/50 (2.0 %)
Rhabdomyoma	1/50 (2.0 %)
Histiocytoma	1/50 (2.0 %)

The histopathological findings revealed that 38.0% (19/50) tumors were malignant neoplasms and 62.0% (31/50) benign neoplasms. This observation corroborated well with the findings of Giri *et al.* (2013) and Baioni *et al.* (2017), who also reported benign tumors being more frequent than malignant tumors in canines.

Breed wise the highest 52.0% (26/50 cases) prevalence of neoplasms was recorded in Mongrel or non-descript breed, followed by Germen Shepherd 16.0% (8/50), Labrador 8.0% (4/50), Golden retriever 8.0% (4/50), Doberman 6.0% (3/50), Pomeranian 4.0% (2/50), Pug 4.0% (2/50), and the lowest in Cocker spaniels 2.0% (1/50). Pawar (2009) and Roshini *et al.* (2013) had also found a higher occurrence of tumors in non-descript dogs than the other breeds. Malicka *et al.* (1996) accounted for 27.0% of non-descript bred dogs with tumours. The local mixed breeds of dogs were reported to be at more risk of cutaneous neoplasms (35.7%) than purebred dogs (Chikweto *et al.* (2011).

In the present study out of the 50 cases, gender-wise analysis revealed that 62.0% (31/50) tumors were found in female dogs as compared to 38.0% (19/50) in males. Kumar *et al.* (2020) also reported that the female dogs had a higher prevalence than male dogs. Similar findings have also been recorded by Sharma *et al.* (2018). In one study, mammary tumours were estimated to occur in 0.2% of female dogs (McEwen and Withrow, 1996)). The present results of higher prevalence of tumors in female than male dogs, however, contradict the findings of Pawar (2009), who recorded higher incidence in males (55.5%) than females (44.4%).

The age of dogs affected with neoplasms varied from 2-12 years with a mean of 7 years (Table 2). Total 50.0% (25/50) of the tumors occurred in the dogs of older age between 9 to 12 years, followed by 46.0% (23/50) in middle age group of 5 to 8 years, and the least 4.0% (2/50) in the young age group of 0 to 4 years. These observations concurred with the findings of Kumar *et al.* (2020), who recorded highest prevalence of tumors in the age group of 6-9 years and lowest in the age group of 0-3 years. Our findings also concurred with the observations of Das *et al.* (2018) and Sharma *et al.* (2018), whereas Pakhrin *et al.* (2007) and Vascellari *et al.* (2009) recorded the mean age for tumor in dogs as 8.3 years from a sample size of 748 dog neoplasms.

Table 2: Age wise occurrence of neoplasm in canine (n=50)

Age (years)	Number & % of animals affected
0-2	0/50 (0.0%)
3-4	2/50 (4.0%)
5-6	8/50 (16.0%)
7-8	15/50 (30.0%)
9-10	21/50 (42.0%)
11-12	4/50 (8.0%)

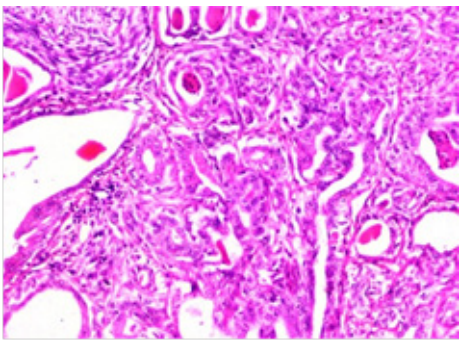

Plate 1: Adenocarcinoma of mammary gland (100X)

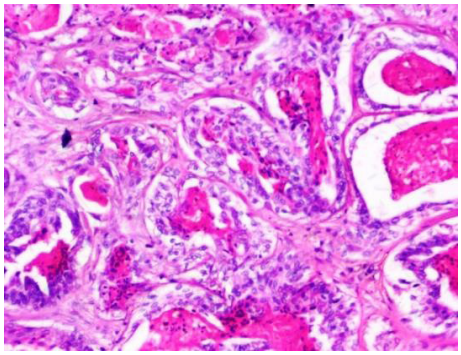

Plate 2: Adenoma (100X)

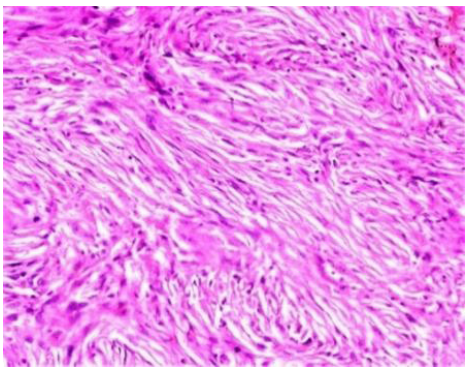

Plate 3: Fibrosarcoma (100X)

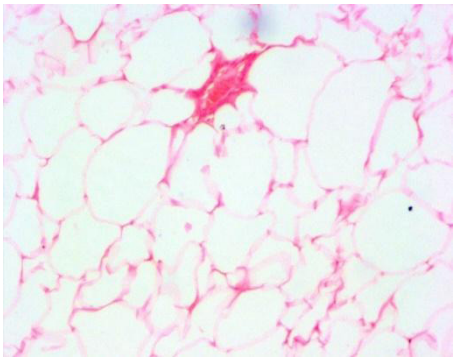

Plate 4: Lipoma (100X)

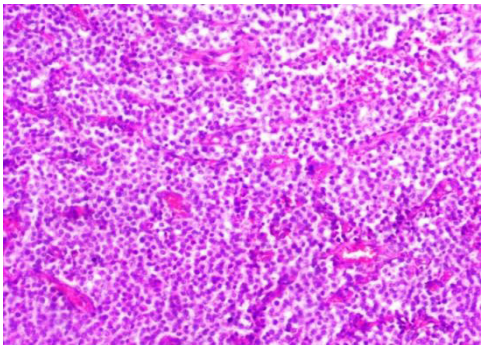

Plate 5: Transmissible venereal tumour (100X)

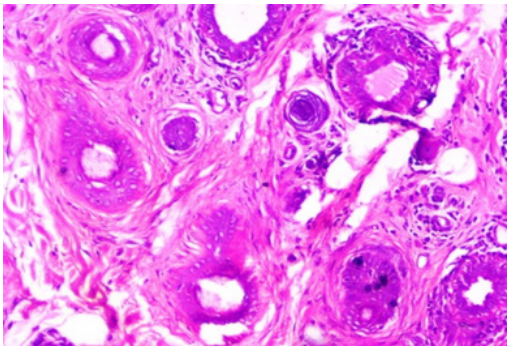

Plate 6: Pilomatrixoma (100X)

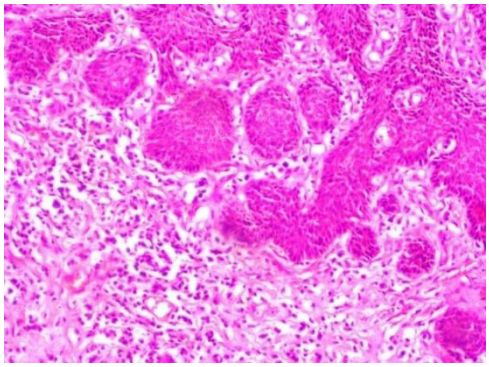

Plate 7: Epulis ((100X)

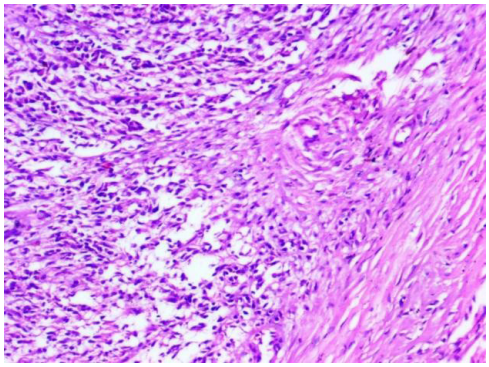

Plate 8: Mast cell tumour (100X)

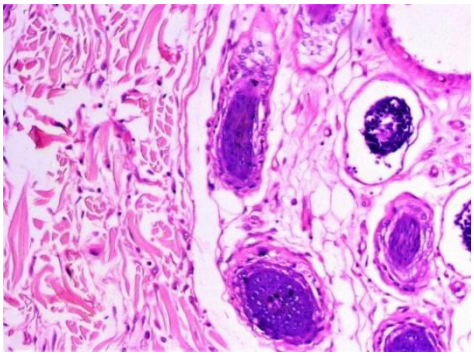

Plate 9: Transitional cell carcinoma (100X)

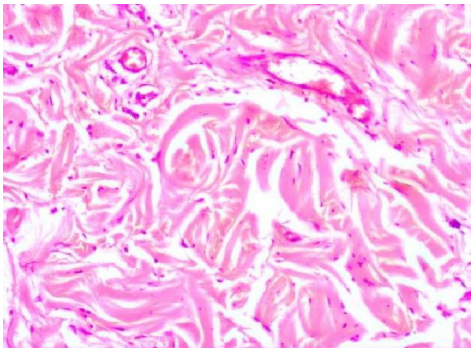

Plate 10: Rhabdomyoma (100X)

Conclusions

From the study, it can be concluded that among the examined 50 cases, mammary gland occupied the most frequent (26.0%) site of skin and subcutaneous tissue tumors with the highest frequency in Mongrel or non-descript dogs and in females in Mumbai region. There are interesting discrepancies between our data and other reports in the incidence of tumour types. The findings indicated that skin and soft tissue tumours and mammary tumours were an important veterinary medical problem for dogs.

Acknowledgement

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