

GLANDULAR DISTRIBUTION AND HISTOLOGY OF MAMMARY TUMOURS IN BITCHES*

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The study was aimed to correlate glandular distribution of canine mammary tumours with its clinical behaviour for prognosis.

Materials and Methods

The study comprised 56 surgical biopsy samples of dogs collected from the Small Animal Clinics, Madras Veterinary College and four were from necropsy at the Department of Veterinary Pathology, Madras Veterinary College during the period from 2002 to 2004. Seventy eight individual specimens were collected from 56 surgical cases, and seven from four necropsied cases showing tumours in different glands. Thus, the total number of tumour specimens consisted of 85. The details pertaining to the breed, age, site, reproductive factors, duration of illness and wherever possible particulars of spaying, number of pregnancies and periodicity of oestrus were gathered. Specific pathologic data collected were location, condition of the surface skin, attachment to the skin or underlying subcutis and size and shape of the mammary tumour. The data were analysed and presented. Tumour identification, histological classification of mammary tumours was made as per the norms given in the World Health Organisation (WHO) criteria (Hampe and Misdorp, 1974).

Results and Discussion

The location of benign and malignant mammary tumours, distribution pattern in respect of varying glands and breeds of animals are given in Table. The recorded benign tumours were, one each from adenoma, fibroadenoma and benign mixed tumours. The descending order of malignant tumours was tubular adenocarcinoma (33), carcinosarcoma (10), solid carcinoma (10), squamous cell carcinoma (10), osteochondrosarcoma (05), papillary adenocarcinoma (04), spindle cell carcinoma (03), anaplastic carcinoma (02), papillary cystic adenocarcinoma (02), fibrosarcoma (01), osteosarcoma (01) and fibro-osteochondrosarcoma (01). Magae *et al.* (2007) also recorded similar tumour types in their study. About 48.24 per cent of the tumours were present on the left chain and 51.76 per cent were on the right chain of the mammary glands. This indicated that more number of tumours occurred in the right side of the mammary chain. In the left chain, 39 (95.12 per cent) were malignant and 2 (4.88 per cent) were benign and in the right chain, 43 (97.73 per cent) were malignant and remaining one (2.27 per cent) was of benign type. Totally, eight two malignant and three benign tumours were encountered from 60

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Table : Pattern of tumour occurrence in bitches bearing mammary tumours (n=85)

Gland No.	Types of gland affected	Total number of tumours recorded	Glandular Pattern					
			Left Chain			Right Chain		
			Benign + Malignant	Total	Tumour types	Benign + Malignant	Total	Tumour types
1.	Cranial Thoracic	03	1 + 1	02	BMT, SC-C	0 + 1	01	TAC-S
2.	Cranial Thoracic	06	0 + 3	03	SC-C, TAC-C, PAC-C	0 + 3	03	TAC-C(2), FS
3.	Cranial Abdominal	10	0 + 7	07	Sqcc-C (2), TAC-C (3), OCS, SPCC	0 + 3	03	Sqcc-C TAC-C (2)
4.	Caudal Abdominal	20	0 + 7	07	CS (3), TAC-C (2), PCAC-C, Sqcc-C	0 + 13	13	Sqcc-C (2), TAC-S (2), TAC-C* (3), SC-C, SPCC CS-3, OCS
5.	Inguinal	46	1 + 2	22	TAC-S (4), TAC-C (5), A, AC, SC**C (3), Sqcc-C (2), SC-S, FOCS, PCAC-C, OCS, CS, OS	1 + 23	24	FA, SPCC, AC, TAC-C (7), PAC-S (2), OCS (2), TAC-S, SC-C (3), CS (3), Sqcc-S, Sqcc-C, PAC-S
	Total	85	2 + 39	41		1 + 43		44

* Only one complex tubular adenocarcinoma showed squamous metaplasia. **Only one complex solid carcinoma showed clear cell type of appearance.

Numbers in the parenthesis indicates total number of that particular tumour encountered in the study.

A : Adenoma	FS : Fibrosarcoma
BMT : Benign mixed tumour	OS : Osteosarcoma
FA : Fibroadenoma	OCS : Osteochondrosarcoma
AC : Anaplastic carcinoma	PAC-C : Papillary adenocarcinoma complex
SC-C : Solid carcinoma complex	Sqcc-S : Squamous cell carcinoma simplex
TAC-S : Tubular adenocarcinoma simplex	Sqcc-C : Squamous cell carcinoma complex
FOCS : Fibro-osteo-chondrosarcoma	PAC-S : Papillary adenocarcinoma simplex
CS : Carcinosarcoma	PCAC-C : Papillary cystic adenocarcinoma complex
SPCC : Spindle cell carcinoma	TAC-C : Tubular adenocarcinoma complex

mammary tumour-bearing bitches. This indicated that, mammary tumours that encountered in bitches are usually malignant in nature.

Of the 85 mammary tumours from sixty bitches recorded, 3.53 per cent of the tumours occurred in the cranial thoracic

gland, 7.06 per cent in caudal thoracic, 11.76 per cent in cranial abdominal, 23.53 per cent in caudal abdominal and 54.12 per cent were in inguinal glands. Of all the tumours, 89.41 per cent were situated in the posterior glands and 10.59 per cent were in the anterior glands. This indicated that

the number of mammary tumour was highest in the two posterior mammary and diminished successively in the proximal glands. This distribution pattern was directly correlated with the size of the glands, since the size of the glands proportionately reduced from posterior inguinal glands to anterior abdominal and thoracic mammary glands. Moulton (1990) also observed 60 per cent of the mammary tumours in the posterior glands.

Stratmann *et al.*, (2006) correlated mammary tumour malignancy with its location, and found more of them were on the caudal glands rather than cranial glands. About 81.5 per cent were malignant and 9.7 per cent benign. They concluded that majority of bitches with multiple mammary gland tumours had one tumour fulfilling the criteria of malignancy. Adjacent tumours of the same side of the mammary gland often possess the same level of malignancy. In this study, 22 bitches showed mammary tumour in multiple glands. This indicated that location of the mammary tumour did not correlate with histological types of survivability. It means that benign as well as malignant mammary tumours occur at any one of the five glands. Benign mammary tumour could occur in the posterior, reversely malignant could occur in the anterior glands. This disproves the general hypothesis of the mammary tumour occurrence. Similar observation was also made by Brodey *et al.*, (1983).

Of the nine anterior gland tumours 9.41 per cent were malignant and 1.18 per cent was benign type. Out of 76 posterior

glands, 87.06 per cent were malignant and 2.35 per cent were benign type. Totally, 96.50 per cent malignant and 3.53 per cent benign tumours were recorded. The above observations indicated that posterior glands had greater propensity for tumour development than the anterior glands. The reasons attributed for development of mammary tumours frequently in the posterior glands were related to senile atrophy with retention of secretion (Cotchin, 1954) and prolonged response to hormonal and carcinogenic stimulus (Hussain *et al.*, 1994). Further, the size of the gland 4 and 5 are largest and presumably contain more glandular tissue to react to any carcinogenic stimulus (Sapierzynski, 2007).

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