

## PATHOLOGY OF MIXED TUMOURS IN DOGS

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**Abstract:** Neoplasm is a dreadful killer of both mankind and animal kind. Among all species neoplasm is a leading cause of death especially in dogs. High incidence of spontaneous primary neoplasms is reported in dogs also next to man. About 45% of dogs, especially of middle aged, suffer/die due to neoplastic background. The present study was carried out to know the incidence, gross pathology and histopathology of mixed tumours encountered in dogs. Studies related to mixed tumours were scanty in dogs. Out of 98 samples collected 9 (9.18%) samples were positive for mixed tumours. The positive tumours were fibroleiomyoma(3,3.06%), fibromyxoma(2,2.04%), fibrolipomyxoma(1,1.02%), angioliopoma(1,1.02%), chondrolipoma(1,1.02%), and fibrolipoma(1,1.02%).

**Keywords:** .Dog, Fibroleiomyoma, Fibrolipomyxoma and Tumour.

**Introduction:** Neoplasm is a leading cause of death in dogs. Higher incidence of spontaneous primary neoplasms was reported in dogs of middle aged with either serious illness or fatal termination. The present study was carried out to know the incidence, gross pathology and histopathology of mixed tumor encountered in dogs. The studies related to mixed tumours were scanty in dogs

**Materials and methods:** For the study 98 tumour samples were collected from the surgical cases of Teaching Veterinary Clinical complex, College hospital and different hospitals in and around Hyderabad. Tumor incidence in terms of age, breed, sex were recorded and gross features like size, shape, colour and consistency of tumours were also recorded. For histopathological studies samples were preserved in 10% buffer formalin, processed routinely for H&E staining. Special stains like VanGiesons also performed [1].

**Results and Discussion:** Out of 98 samples collected 9 (9.18%) were positive for mixed tumours. Histologically the tumours were fibroleiomyoma(3), fibromyxoma(2), fibrolipomyxoma(1), angioliopoma(1) chondrolipoma(1), and fibrolipoma(1). The existence/presence of mixed tumours in domestic animals [2], [3], and in dogs [4], [5] was reported previously.

**Fibroleiomyoma:** In the present study, fibroleiomyoma was seen in three cases (3.06%) at vaginal region in two non descriptive dogs [Fig.1] and one Doberman aged between 7-9 years. Fibroleiomyoma consists of smooth muscle and connective tissue and generally have been reported in female reproductive tract of dogs and cats [6], [7]. In a tumor study reported the presence of fibroleiomyoma in 66 (77.64%) cases out of 85 tumours in female genitalia of dogs [6]. In vagina of cow one fibroleiomyoma was reported among 9 vaginal tumours [9]. Fibroleiomyoma were also reported in uterus of cheetah [10], elephant [11] and goat [12].

Grossly the tumours were well demarcated and firmly attached at vaginal region. The cut surface was hard, multiloculated and cream coloured, originating from the muscularis layer of vagina [9], [13]. Histologically tumour revealed admixture of smooth muscle, collagen and fibroblastic cells [9]. Neoplastic cells in some area consists, of interlacing bundles of smooth muscle fibres with acidophilic cytoplasm and cigar shaped, blunt ended and enlarged nuclei. In some areas fibroblastic cells revealed whorls and interlacing bundles of connective tissue fibers and cells. The cells were fusiform and spindle shaped possessing large ovoid to elongated nucleoli. VanGiesons stain differentially stains the muscle and connective tissue elements [fig.2], [2], [13].

**Fibromyxoma:** In the present study 2 (2.04%) cases were fibromyxoma. fibromyxomas 4.8%, in canine dermal tumours was reported [14]. Reference [4] reported 2% of fibromyxomas in canine tumours.

Fibromyxomas were seen in a 9 year old male Pomeranian dog at mandibular region [Fig.3] and at knee joint of a 7 year old non descriptive dog. Tumours were about 1cm, irregular, grayish to white, gelatinous to firm in consistency. Mucin in the intercellular matrix is the chief feature that distinguishes the myxoma from fibroma and clinically these are benign tumours with local recurrence [15].

Histologically the tumour composed of spindle and stellate shaped cells with nuclei embedded in a mucinous extracellular matrix [Fig.4]. Scattered cells appear either as single or in mass of clusters. The individual tumour cells were stellate shaped, the cell nuclei are round, ovoid, elongated with multiple nucleoli. In most of tumours collagen fibres were abundant, and hence the term fibromyxoma [14], [16].

**Fibrolipomyxoma:** Out of 98 samples 1 was fibrolipomyxoma (1.02%). As such Fibrolipomyxoma was not reported earlier in dogs. Fibrolipomyxoma have been rarely reported in humans, to the best of authors' knowledge this is the 1<sup>st</sup> report of Fibrolipomyxoma in dogs. It was observed in 6 year

old male Labrador, located at abdomen near to shoulder [Fig.5]. Growth was 3cm, single, greyish to white, round, soft in consistency and found in subcutis.

Microscopically tumour revealed admixture of fibrous, lipid, myxomatous tissue. VanGiesons stain differentially stains the fibrous component and other parts [Fig.6]. The tumour revealed some area of myxomatous tissue in which stellate cells noticed and some part showing the well differentiated adipocytes with eccentrically placed nuclei having a full component of fat.

**Angiolipoma:** Lipomas were the common lipid tumour of dogs. Variants of lipoma are characterized by additional component like capillaries in angiolipoma, fibrous connective tissue in fibrolipoma, cartilage connective tissue in chondrolipoma, osteous connective tissue in osteolipoma.

In present study one angiolipoma (1.02%), one fibrolipoma (1.02%) and one chondrolipoma (1.02%) were noticed. Previously angiolipomas were reported by in dogs [17], [18]. Angiolipomas have the potential to arise in any body structure having the mesodermal tissue [17]. The trunk is the common site for lipomas in dog and apparently for angiolipomas [19]. Tumour appeared at the lower abdomen as small nodules with 1 cm, white coloured and soft in nature.

Differentiation of angiolipoma with sparse vascularity from a simple lipoma and high vascular angiolipoma from infiltrating adipose tissue could both present a

diagnostic challenge, but presence of large vessels are normally not seen in lipoma and absence of nerve normally seen in adipose tissue are features that may allow differential diagnosis [19]. Angiolipomas were solitary subcutaneous nodules composed of thin walled blood vessels and randomly distributed lobules of well differentiated adipose tissue [Fig.7]. Endothelial cell lined the blood vessels. Many vessels were dilated and filled with erythrocytes.

**Fibrolipoma:** Out of 98 samples one was fibrolipoma (1.02%). Fibrolipoma and infiltrating lipoma were uncommon but has been reported in dogs and cats [18], [19]. The tumour was located in the subcutis of groin region. Grossly tumour was smooth, glistening. The cut surface was white composed of adipose and fibrous tissue. Histologically tumour revealed diffusely scattered adipocytes with low cellularity. Fibrous connective tissue is seen in some areas very few mitotic figures.

**Chondrolipoma:** Out of 98 samples one was chondrolipoma (1.02%). Four cases of chondrolipoma and two cases of osteolipoma in canine dermal neoplasms were reported[20].

In the present study chondrolipoma was recorded at the stifle joint of 12 year old non descriptive dog. Grossly it was 3cm in diameter, grey, hard and firm in consistency. Tumours consist of admixture of lipid and cartilage tissues [Fig 9].The presence of mature chondrocytes without multivacuolated cell may assist in diagnosing the chondrolipoma[21].

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**Figures:**

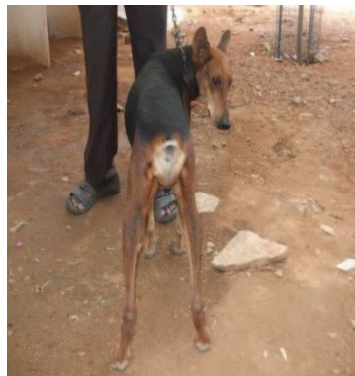


Fig.1: Doberman dog showing the fibroleiomyoma tumour at vagina

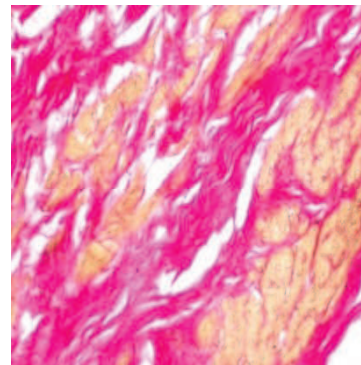


Fig.2: Fibroleiomyoma showing the collagen fibers and smooth muscle tissue (VG 100X)

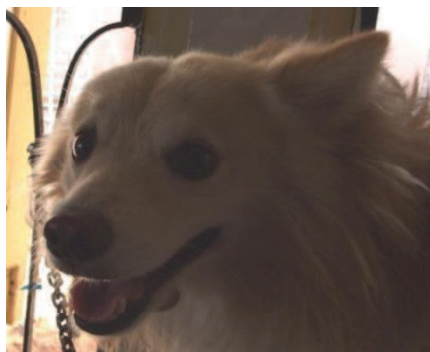


Fig.3: Pomeranian Dog showing the fibromyoma tumour at lower jaw region

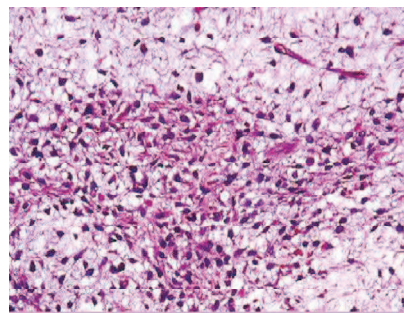


Fig.4: Fibromyoma composed of spindle and stellate shaped cells with nuclei embedded in a mucinous extracellular matrix (H&E 200X)



Fig.5: Labrador dog showing the fibrolipomyoma at ventral abdomen near to shoulder region

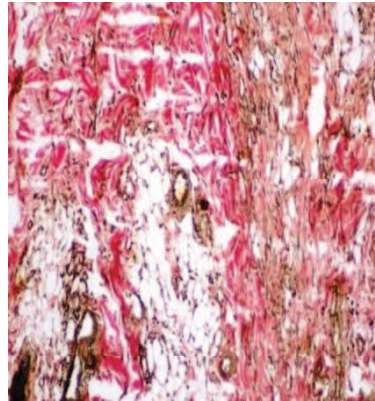


Fig.6: Fibrolipomyoma composed fibrous, lipid and myxomatous tissue (Van-Gieson's 100X).

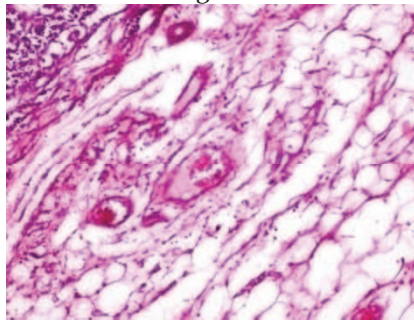


Fig.7. Angioliipoma composed of thin walled blood vessels and randomly distributed lobules of well differentiated adipose tissue (H&E 100X)

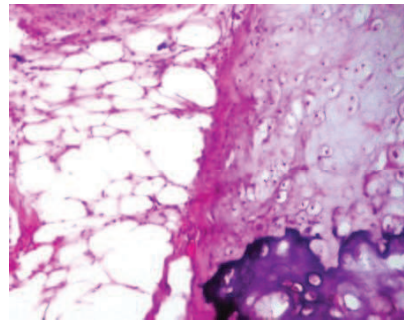


Fig.9: chondrolipoma showing the admixture of lipid and cartilage tissues (H&E 200X)

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