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HISTOPATHOLOGICAL FEATURES OF CUTANEOUS TUMOURS ARISING FROM THE VASCULAR ENDOTHELIAL CELLS IN DOGS

Jayasree N^{*}, Nasreen A, Naik SH, Murthy RVR, Srilatha Ch and Sujatha K

Department of Veterinary Pathology, CVSc, SVVU, Tirupati 517502, A.P, INDIA

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KEYWORDS

Cutaneous tumours

Dogs

Hemangioma

Hemangiosarcoma

Lipohemangioma

ABSTRACT

Cutaneous growths arising from the endothelial cells of blood vessels were studied in three dogs (Two in male cocker spaniels and one in male Labrador). All the three growths were surgically excised and referred to the Department of Veterinary Pathology, Tirupati for histopathological confirmation during the period from August 2015 to December 2015. Gross examination revealed, firm reddish, soft dark red and soft greyish red coloured masses and are diagnosed based on histopathological features as hemangiosarcoma, cavernous hemangioma and lipohemangioma respectively. In the case of hemangiosarcoma, severe necrosis along with the presence of blastomyces organisms as a secondary infection was also noticed. Occurring of these tumours might be because of exposure of lightly pigmented areas to Ultra Violet radiation.

* Corresponding author

E-mail: jayasreerdysvvu@gmail.com (Jayasree N)

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1 Introduction

In canines, skin, soft tissue and mammary glands are the commonest sites for the development of various benign tumours compared to malignant (Anudep et al., 2003; Aleksic-Kovacevic et al., 2005; Murphy, 2006). Based on the survey on dermatological conditions of dogs conducted by Hill et al. (2006) in UK, cutaneous parasitic infestations, bacterial infections and neoplasia were noticed in majority of the cases. Of all the cutaneous neoplasms of dogs, tumours of vascular origin and transmissible venereal tumours were considered as more common one (Chikweto et al., 2011).

The etiological factors that are responsible for the occurrence of these tumours were not well understood. Some authors reported that, breed and ultraviolet radiation are the major risk factors for various canine cutaneous hemangiomas, hemangiosarcomas and squamous cell carcinomas (Hargis et al., 1992; Nikula et al., 1992; Chikweto et al., 2011). Spontaneous tumours of blood vessel endothelial cells were described commonly in the dog, less frequently in the cat and horse, and sporadically in most other domestic species (Goldschmidt & Hendrick, 2002). Cutaneous hemangiomas are common in the dog, when compared to primary canine cutaneous hemangiosarcomas (Hargis et al., 1992). Hemangiosarcoma is one of the most challenging and mysterious diseases encountered in veterinary practice. It is a malignant, aggressive tumour that arises from the mutated vascular endothelial cells (Murakami et al., 2001). Hemangiosarcoma represents up to 7% of all tumours and 12% to 21% of all mesenchymal neoplasms in dogs (Clifford et al., 2000; Smith, 2003; Schultheiss, 2004; Thamm, 2007).

Two forms of the hemangiosarcomas i.e., visceral and dermal forms exists. In the visceral form, the most frequently affected organs were spleen and liver (Day et al., 1995; Withrow &

MacEwen, 2001; Hristov et al., 2007) and rarely seen in the retroperitoneal organs like adrenal glands, kidneys and ureters (Wang & Su, 2001; Liptak et al., 2004) and uterus (Murakami et al., 2001). Whereas in dermal form, most common predilection sites are ventral abdomen, prepuce and pelvic limbs (Ward et al., 1994). In the breeds like Beagle, blood hound, English Pointer and Dalmatian, dermal form is commonly seen. German shepherds, Golden and Labrador retrievers, Schnauzers and Maltese breeds are also overrepresented in many case series (Smith, 2003; Hidaka et al., 2006; Hristov et al., 2007).

2 Materials and Methods

The tumour masses were surgically excised under general anaesthesia. The masses were fixed in 10% neutral buffered formalin, processed routinely, embedded in paraffin, sections were taken with thickness of 5 μ m and stained with hematoxylin and eosin for histopathological examination.

3 Results and discussion

In the present study, vascular endothelial cell tumours arising from the cutaneous blood vessels were noticed clinically in three dogs out of twenty dogs affected with cutaneous tumours during the period from august 2015 to December 2015. Out of three cases, two were noticed in male cocker spaniels and one in male Labrador with a history of decreased appetite and weight loss.

3.1 Case 1

A ten year old male cocker spaniel dog was presented with a firm reddish tumour mass located on the skin near the ventral region of abdomen (Figure.1). Cut section of the mass revealed severe oozing of the blood.



Figure 1 Note reddish mass under the abdomen in cocker spaniel dogs

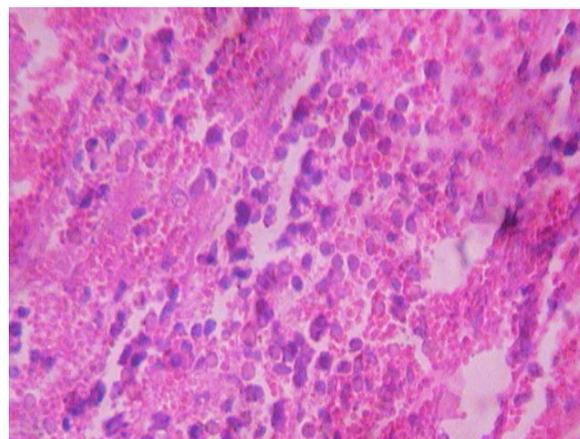


Figure 2 Note immature endothelial cells forming blood filled irregular vascular spaces

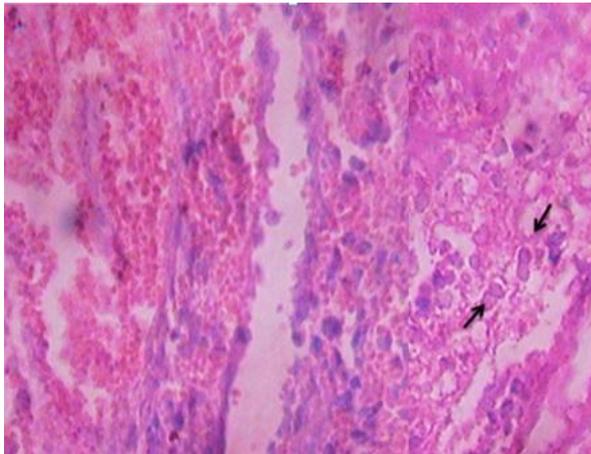


Figure 3 Section showing budding of blastomyces organisms (arrows) along with proliferated endothelial cells forming blood filled vascular spaces

On microscopic examination, pleomorphic endothelial cells forming irregular vascular spaces containing variable amounts of blood were noticed (Figure.2). The immature endothelial cells were plump to spindle in shape with oval to round nuclei and it was diagnosed as hemangiosarcoma based on histopathological features. These features of hemangiosarcoma in the present study were similar to the features reported by previous authors (Park et al., 2008; Palanivelu et al., 2013). Further, in addition to proliferating endothelial cells, fungal infection with blastomyces species (Figure.3) was also observed as a secondary infection in our study.

3.2 Case 2

In a male cocker spaniel dog aged above six years, a soft dark red coloured mass was observed on the hindlimb (Figure.4). The mass revealed the presence of numerous greatly dilated



Figure 4 Note note red colored mass on the hindlimb in cocker spaniel

blood filled vascular spaces lined by single layer of endothelial cells (Figure.5). The neoplastic endothelial cells have vesicular nuclei with eosinophilic cytoplasm. Based on microscopic lesions, it was diagnosed as cavernous hemangioma. These lesions are in accordance with the findings of Hargis et al. (1992) and Balachandran et al. (2014).

3.3 Case 3

A surgically excised soft greyish red coloured mass located on the ventral abdomen in six years old Labrador retriever was referred to the Department of Veterinary Pathology for histopathological findings. Histopathological examination revealed numerous vascular spaces lined by endothelial cells along with round to polymorphic fat cells having eccentrically placed nucleus (Figure.6 and Figure.7) and these findings were identified as lipohemangioma.

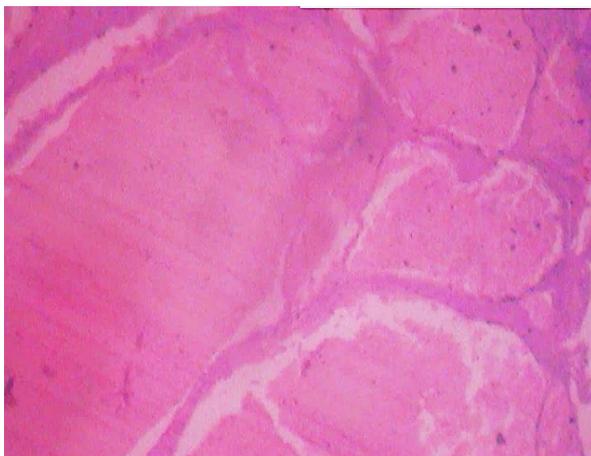


Figure 5 Section showing numerous greatly dilated blood filled vascular spaces lined by single layer of endothelial cells

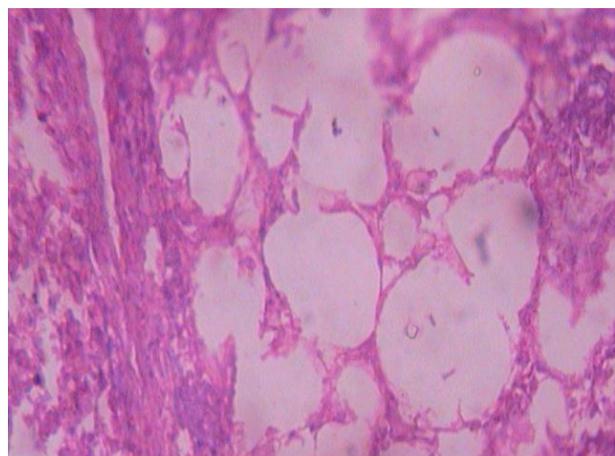


Figure 6 Note pleomorphic fat cells with eccentrically placed flattened nucleus

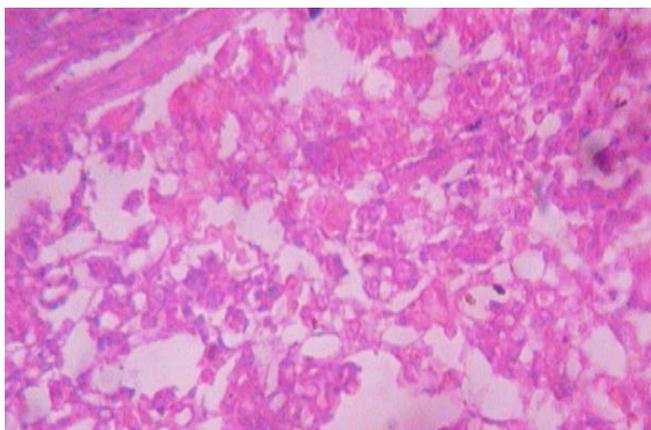


Figure 7 Note numerous vascular spaces containing RBCs along with immature lipocytes.

The features of mixed tumour of lipoma and hemangioma are in accordance with the earlier reports (Goldschmidt & Schofer, 1992; Palanivelu et al., 2013). Tumours occurring most commonly on the ventral abdomen and pelvic limbs were in agreement with a report of 13 Beagles, in which the skin of the lower abdomen and preputial area seemed to be most commonly affected (Culbertson, 1982). In the present study all the three cases were noticed in sparsely haired areas near the abdomen and on legs, for which the possible aetiology might be solar radiation as per the previous reports (Hargis et al., 1992; Ward et al., 1994).

Conclusion

In the present study, two benign and one malignant cutaneous vascular tumour were noticed and poor prognosis was observed in the case of malignant neoplasm i.e., hemangiosarcoma. Malignant tumours arising from the blood vessels are highly metastatic and aggressive and their prognosis is very poor. Early detection and treatment with surgery and chemotherapy prolongs the survival times. Histopathological examination was the most reliable method for diagnosis of cutaneous tumours.

Conflict of interest

Authors would hereby like to declare that there is no conflict of interests that could possibly arise.

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