PATHOMORMPHOLOGICAL STUDY OF SEMINOMA IN DOGS

A.K. Mohapatra*, D. Das, S.K. Panda, B. Jena, Jasmeet Singh and A.P. Acharya
Deptt. of Veterinary Pathology, College of Veterinary Science, Orissa University of Agriculture & Technology, Bhubaneswar.
[Received: 05.4.2015; Accepted: 12.10.2015]

Animal models of cancer have proven to be useful for studying oncogenesis (Martin, 2001), molecular mechanisms of initiation and promotion (Loechler *et al*., 2001), angiogenesis (Norrby, 2006) and metastasis. Naturally occurring neoplasms in animals often exhibit many similarities with their corresponding human cancers and may represent useful model systems for investigating mechanisms of neoplastic progression in both humans and animals (LeRoy and Northrup, 2009). Obtaining knowledge is necessary so that more attention can be paid towards developing therapeutic measures for the most prevalent reproductive disorders in canines (Ramsingh *et al*., 2013). Kennedy *et al*. (1998) classified primary testicular neoplasms into 3 types including sex cord/stroma tumors (interstitial cell tumors, Sertoli cell tumors), germ cell tumors (seminoma, teratoma), and epithelial tumors (rete adenoma and carcinoma).

The present investigation was undertaken in the Department of Veterinary Pathology, CVSc & AH, OUAT, Bhubaneswar, Odisha from December 2013 to June 2014. Clinical cases of different breeds of dogs in the age group of one to twelve years owned by private dog owners presented to Teaching Veterinary Clinical Complex (TVCC), different veterinary hospitals and pet clinics in and around Bhubaneswar were included in the current study. The dogs, presented with known breeding history and complaints of reproductive disorders were taken for the study. The dogs having testicular swelling which were tentatively diagnosed to be tumourous growths were surgically operated under general anaesthesia. The excised tumour samples were collected in 10 per cent formalin for histopathological examination. Paraffin tissue sections of 4-6 µm thickness were cut and stained with haematoxylin and eosin.

Out of total 381 cases presented, only 156 cases (40.94 %) were having pathological involvement of reproductive organs. Among these cases, 23 male dogs (14.75 %) were presented. Incidence of testicular tumours was found to be 3.2 percent (five out of 156 cases) among all reproductive disorders of dogs and constituted 7.46 per cent (five out of 67 cases) of all types of tumours occurred in dogs during the study period. The animals affected with testicular tumours were within the age group of 9 to 12 years. . Enrico *et al*. (2000) also reported that the mean age of occurrence of seminoma was 10.5 years. Two surgically excised cases of testicular tumour were diagnosed to be seminoma on the basis of gross and histopathological observations. The masses were 6 - 8 cm in diameter and hard in consistency (figure 1). Grossly one of the testicles was found to be much larger in size as compared to the normal counterpart which was suspected for testicular tumour. Cut section revealed creamy white surface with lobules and gel like serous fluid was present (figure 2). Takiguchi *et al.* (2001) reported that seminoma was usually unilateral and solitary, although a few were bilateral or multiple.

Histopathological examination revealed diffuse sheets of cells with round to ovoid cells. The cytoplasm was scanty and nuclei were large, variable sized and vesicular in nature. There were cluster of

[#]Part of M.V.Sc. thesis of first author

lymphoplasmacytic cells surrounding atrophic seminiferous tubules (figure 3).

Nuclei were hyperchromatic with 1 or 2 nucleoli. Presence of binucleate cells was observed. Mitotic figures were seen. Stroma was abundant. Necrotic areas with presence of bacterial colonies and neutrophils were seen (figure 3 and figure 4).

Fig1 Testicular tumour in a male dog

Figure 2 Cut section of testicular tumour in one of the testicles (dissected) along with a normal testis

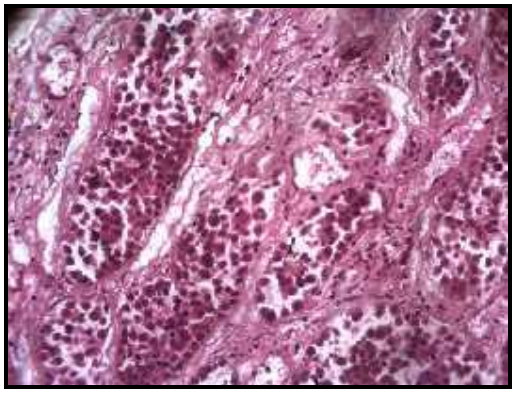

Figure 3 Section showing seminoma with cluster of accumulation of lymphocytic cells Surrounding atrophic seminiferous tubules. (40X)

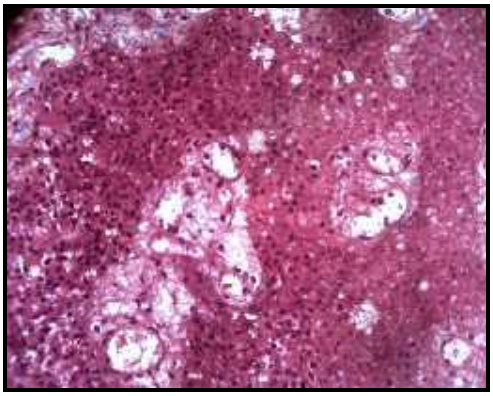

Figure 4 Extensive neutrophilic infiltration surrounding atrophic seminiferous tubules (40X)

Cowell *et al*. (2008) have also suggested moderate to large numbers of cells that vary in size associated with sparse amount of cytoplasm in seminoma. Presence of binucleate or multinucleate cells with mitotic figures have also been stated by Baker and Lumsden (2000).

Moulton (1990) also reported large nuclei, hyperchromatic and mitotic figures as a common finding on histopathological examination in seminoma which corroborated with the findings in the present study.

References

Baker, R. and Lumsden, J.H. (2000) The skin. In: Colour Atlas of Cytology of the Dog and Cat. 1st Edn. Mosby, New York. Pp. 39-70.

Cowell, R.L., Tyler, R.D., Meinkoth, J.H. and DeNicola, D.B. (2008). The male reproductive tract: Prostrate, testes and semen. In: Diagnostic Cytology and Hematology of the Dog and Cat. 3rd Edn., Mosby Elsevier, St. Louis, Missouri. Pp. 373-374.

Enrico, P.S., Armando, B. and David, R. (2000). Seminoma with cutaneous metastases in a dog. *J. Am. An. Hosp. Assoc.,* **36**: 253-256.

Kennedy, P.C., Cullen, J.M., Edwards, J.F., Goldschmidt, M.H., Larsen, S., Munson, L. and Nielsen, S. (1998). Histological Classification of Tumors

of the Genital System of Domestic Animals. *World Health Organisation International Histological classificationof Tumours of Domestic Animals*. Second Series, Volume IV. Armed Forces Institute of Pathology, Washington, D.C. Pp. 17-19.

LeRoy, B. E. and Northrup, N. (2009). rostate cancer in dogs: Comparative and clinical aspects. *The Vet. Jour.,* **180**: 149–162

Loechler, E.L., Henry, B. and Seo, K.Y. (2001). Cellular responses to chemical carcinogens. In: Coleman, W.B., Tsongalis, G.J. (Eds.), The Molecular Basis of Human Cancer. Humana Press, Totowa, NJ, Pp. 203–221.

Martin, G.S. (2001). The hunting of the SRC. Nature reviews. Molecular Cell Biology 2, Pp. 467– 475.

Moulton, I.E. (1990) Tumours in Domestic Animal. 3rd Ed., University of California Press, Berkle, Los Angles and London. Pp. 511.

Norrby, K. (2006. In vivo models of angiogenesis. *J. Cellu. Mole. Medi.,* **10**: 588–612.

Ramsingh, L., Sadasiva Rao, K. and Muralimohan, K. (2013) The Reproductive disorders and Dystocia in Canines. *IOSR J. Phar.,* **1**: 15-16.

Takiguchi, M., Lida, T., Kudo, T. and Hashimoto, A. (2001) Malignant seminoma with systemic metastases in a dog. *J. Small Anim. Pract*., **42**: 360 – 362.

ATTENTION

Hereby attention of all the Life Members of the I.S.A.C.P. is drawn for updating their addresses. If any body is not getting the News Letters and other Communications regularly, is requested to update the ISACP with Latest Address, E-mail I.D., Telephone No. and Cell No. to the Society's Regd. Office – Indian Society for Advancement of Canine Practice, 21/5, Sector – 21, Indiranagar, Lucknow – 226 016; India.

E-mail: isacp.newsletter@gmail.com; sugandha31@rediffmail.com