



LEYDIG CELL TUMOUR OF THE RIGHT TESTICLE IN AN ELEVEN YEAR OLD LABRADOR DOG

Received: 15.07.2016

Accepted: 09.08.2016

Testicular tumours are the second most common tumour in male dogs. Primary testicular tumours account for about 90 per cent of all tumours affecting the male genitalia (Hayes and Pendergrass, 1976). According to the World Health Organization (WHO) classification of tumours of domestic animals, the major types of testicular tumour in dogs are sex cord stromal tumours, germ cell tumours and mixed germ cell sex-cord stromal tumours (Kennedy *et al.*, 1998). The common types of sex cord stromal tumours are Sertoli cell tumour and Leydig cell tumour (Interstitial cell tumour, ICT) and that of germ cell tumour is seminomas.

Testicular tumours are mostly seen in mature and old animals; the occurrence of ICT in dogs increases with increasing age. ICT in dogs are often seen as multiple nodules and make the contour of the organ irregular. Some ICTs of dogs may produce excess androgen, but mostly do not exhibit signs of hyperandrogenism.

An 11-year old male Labrador dog, weighing 52 Kg, was presented to the clinics of the Department of Veterinary Gynaecology and Obstetrics, Veterinary College, Bengaluru with a history of unilateral scrotal enlargement which was observed for the past one year. The animal was obese, otherwise normal without any symptoms. Physical examination revealed unevenly enlarged and hard right testicle (Fig. 1). The left testicle was soft and normal in size. Both the testicles were freely moving and there was no pain on palpation.

Haematology revealed RBC count of 7.30 millions/ μ l (Reference range: 5.5–8.5

millions/ μ l), WBC count of 15,500/ μ l (Reference range: 6000–17,000/ μ l), PCV 42.4% (Reference range: 37–55%), Haemoglobin 13.2 g/dl (Reference range: 12–18 g/dl), platelet count of 3,24,000/ μ l (Reference range: 2,00,000–5,00,000/ μ l) and serum creatinine and SGPT levels of 1.1 mg/dl (Reference range: 1.0–2.2 mg/dl) and 37 U/L (Reference range: 10–109 U/L), respectively. All haematological and biochemical parameters studied were found to be within the normal range.

Based on the clinical findings, the case was tentatively diagnosed as tumour of testis and decided to perform orchiectomy to prevent metastasis and further complications.

Bilateral orchiectomy was performed as per standard surgical procedures under general anaesthesia.

On gross examination, the left testicle was of normal size (3x2x2 cm), smooth and soft. Right testicle was irregular in shape, larger in size (6x4x4 cm), hard to palpate and with



Fig. 1. Enlarged right testicle in a Labrador dog

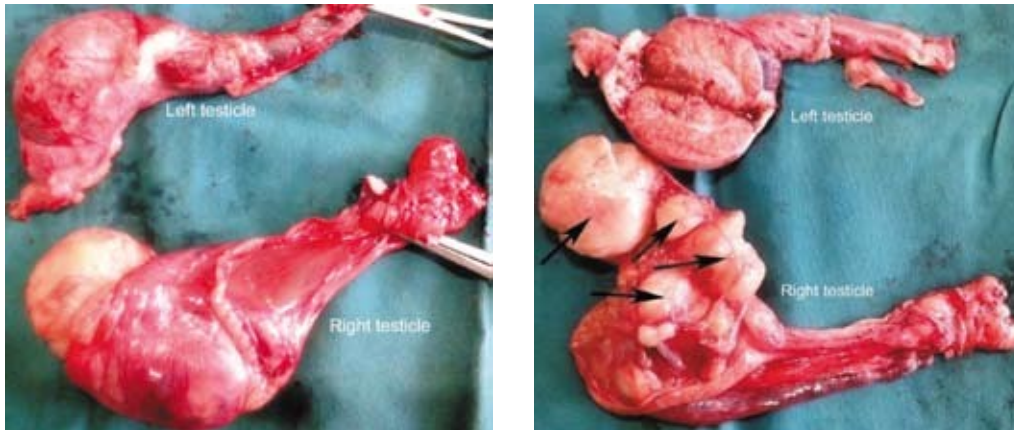


Fig. 2. Left and right testicles after removal (2a); cross section of testicles (2b), nodules in right testicle

nodules. Cut section of right testicle showed several well-circumscribed soft brownish-orange nodules of 2 mm to 1.5 cm in size (Fig. 2). Representative tissue samples were collected, preserved in 10 per cent buffered formol saline and processed for histopathological studies.

Histopathological studies of the specimens collected from testicle had morphologic characteristics of Leydig cell tumour. Tumour cells were round to polyhedral in shape, arranged in diffuse sheet like growth pattern. Cytoplasm was eosinophilic, dense and abundant. Cells had distinct round to oval nucleus with vesicular appearance and prominent nucleoli. Occasionally, binucleate cells were also detected (Fig. 3). Similar histopathological features typical of interstitial (Leydig) cell tumours were also reported (Owston and Ramos-Vara, 2007; Bigham *et al.*, 2009; Ciaputa *et al.*, 2012; Foster, 2016).

ICTs are formed from the inter-tubular

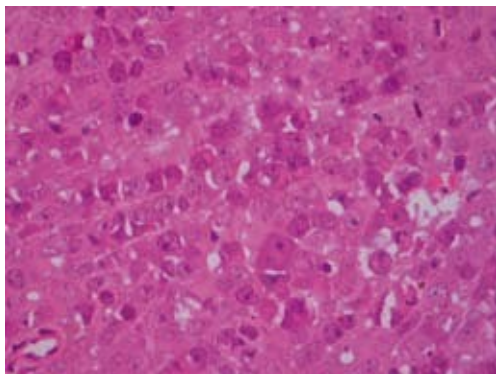


Fig. 3. Microphotograph of Leydig cell tumour of testis (400X)

endocrine cells of the testis and are mostly reported in aged dogs of approximately 10 years of age. There is no breed predisposition for ICT (Johnston *et al.*, 2001). Canine testicular tumours were found more frequently in the right than in the left testis (Foster, 2016). Unlike other testicular tumours, ICTs are seen in scrotal testis. Usually ICTs are symptomless, not detected clinically but are incidental findings during necropsy. ICTs were the most common tumours identified in clinically normal testes (Liao *et al.*, 2009). In this case also, tumour was observed in right testis and was symptomless, except for obesity. Obesity of the animal may be due to anabolic effects of increased levels of androgen produced by the tumour.

ICTs are small sized tumours, mostly 1 mm to 2 cm in diameter and are rarely large enough to increase the size of testis. They may change the testicular contour making it irregular with the rounded nodules on the testicular tissue. Macroscopically, the tumours are described as small, individual or multiple foci of yellow to brown colour, soft on palpation, clearly demarcated from the surrounding tissue (Grieco *et al.*, 2008). Similar findings were noticed in the present case also.

Paraneoplastic symptoms reported with ICTs are due to either hyperestrogenism or hypertestosteronism. Dogs with ICT had greater concentrations of oestradiol and inhibin-like immunoreactivity in both peripheral and testicular venous blood (Peters *et al.*, 2000). Clinical signs reported in dogs with elevated serum oestrogen levels included aplastic anaemia, pale mucosa,

petechiation, prolonged bleeding time and bilateral symmetrical, non-pruritic alopecia of the trunk and flank region (Johnston *et al.*, 2001). Some ICTs produced excess androgen, but most tumours did not cause signs of hyperandrogenism (Foster, 2016). Clinical signs reported in dogs with ICT associated with elevated serum testosterone levels included prostatic hyperplasia, multiple hepatoid perianal adenoma, perianal hyperplasia, tail gland hyperplasia and perineal hernia (Johnston *et al.*, 2001). On contrary, Peters *et al.* (2000) reported that the testosterone concentration in testicular venous blood of dogs with ICT was lower than that in dogs with normal testes. Even though ICTs normally secreted androgens, it rarely produced clinical manifestations of hyperandrogenism. Metastasis of ICTs was extremely rare and was thought to be the least likely of the testicular tumours to metastasize (Meuten, 2002). However, Togni *et al.* (2015) reported metastasis of a malignant ICT of right testicle to the skeletal musculature of the left hind limbs in an eleven year old Fox Terrier. Metastasis of the tumour could not be detected in the present study.

References

- Bigham, A.S., Karimi, I., Shadkhast, M., Imani, H. and Khaghani, A. 2009. Left intrainguinal canal cryptorchidism concurrent with two pathological findings in a mixed-breed aged dog. *Comp. Clin. Pathol.* **18**: 463 – 466.
- Ciaputa, R., Nowak, M., Bowicz, M., Antonczyk, A., Blasiak, K. and Madej, J. 2012. Seminoma, sertolioma and leydigoma in dogs: Clinical and morphological correlations. *Bull. Vet. Inst. Pulawy*, **56**: 361 – 367.
- Foster, R.A. 2016. Male genital system. In: Maxie, M.G. (Ed.), *Jubb, Kennedy and Palmer's Pathology of Domestic Animals* (6th Ed., Vol. 3), St. Louis, Missouri. pp. 465 – 510.
- Grieco, V., Riccardi, E., Greppi, G.F., Teruzzi, F., Iermano, V. and Finazzi, M. 2008. Canine testicular tumours: a study on 232 dogs. *J. Comp. Pathol.* **138**: 86 – 89.
- Hayes, H.M. and Pendergrass, T.W. 1976. Caninetesticular tumours: Epidemiologic features of 410 dogs. *Int. J. Cancer*, **18**: 482 – 487.
- Johnston, S.D., Root-Kustritz, M.V. and Olson, P.N.S. 2001. Canine and feline theriogenology (1st Ed.), W.B. Saunders Co., Philadelphia. pp. 592.
- Kennedy, P.C., Cullen, J. M., Edwards, J. F., Goldschmidt, M.H., Larsen, S., Munson, L. and Nielsen, S. 1998. Histological classifications of tumours of the genital system of domestic animals. World Health Organization International Histological Classification of Tumours of Domestic Animals, **4**: 17 – 18.
- Liao, A.T., Chu, P., Yeh, L., Lin, C. and Liu, C. 2009. A 12-Year retrospective study of canine testicular tumors. *J. Vet. Med. Sci.* **71**: 919 – 923.
- Meuten, D.J. 2002. Tumors in domestic animals. Iowa State Press, Ames. pp. 561–567.
- Owston, M.A. and Ramos-Vara, J.A. 2007. Histologic and immunohistochemical characterization of a testicular mixed germ cell sex cord-stromal tumor and a leydig cell tumor in a dog. *Vet. Pathol.* **44**: 936 – 943.
- Peters, M.A.J., de Jong, F.H., Teerds, K.J., de Rooij, D.G., Dieleman, S.J. and van Sluijs, F.J. 2000. Ageing, testicular tumours and the pituitary–testis axis in dogs. *J. Endocrinol.* **166**: 153 – 161.
- Togni, A., Rutten, M., Bley, C.R. and Hurter, K. 2015. Metastasized Leydig cell tumor in a dog. *Schweizer Archiv fur Tierheilkunde.* **157**: 111 – 115. ■

B. Bibin Becha¹, G. Sudha², B. Sunita¹, S. Mahendra³ and C.R. Deepti³

Department of Veterinary Gynaecology & Obstetrics
Veterinary College, Hebbal, Bengaluru – 560 024.

1 & 2. *Ph.D. Scholars*

3. *Associate Professor*

4 & 5. *M.V.Sc. Scholars*

* (*Corresponding author*)