Indian J. Vet. Pathol., 49(3) : 250-253, 2025: DOI: https://doi.org/10.56093/8ky8qx64

SHORT COMMUNICATION

Cytological diagnosis of seminoma in dog

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Received: 7.5.2025; Accepted: 10.6.2025

ABSTRACT

A 10-year-old intact male Spitz dog was presented at Sanchu Animal Hospital, Chennai for diagnosis and treatment with the history of unilateral scrotal swelling since few months. Physical examination of the affected dog showed a marked enlargement of left testis with peeling of skin due to frequent licking. On palpation of affected testis, mild pain was evinced. No enlargement of regional lymphnodes was noticed. Hematobiochemical studies revealed mild anemia, an increase in serum total protein and globulin and a decrease in A/G ratio. Cytological examination of the aspirated smears from the affected testis was suggestive of seminoma which revealed moderate cellularity with cells being discrete, round to ovoid and exhibiting moderate pleomorphism. The cytoplasm was homogenous and slightly basophilic containing prominent large spherical to ovoid nuclei with coarsely reticular chromatin. In many areas, binucleate and multinucleate cells were present. In addition, mitotic figures were also seen in some areas. Based on the cytological examination, the mass was identified as seminoma.

Keywords: Cytology, haematobiochemical studies, seminoma, spitz

Tumours affecting the genital system of dogs include testicular tumors (sertoli cell, interstitial cell, seminoma), vaginal tumors (leiomyoma, fibroleiomyoma, fibroma) and the transmissible venereal tumor (TVT). Of all canine male genital tumours, testicular tumours represent more than 90 per cent and dogs record the highest incidence of all animal species. Among various testicular tumours in dogs, seminoma, which results from neoplastic transformation of germ cells of testes is one of most common tumours encountered in aged male dogs. Although seminoma exhibits malignant evidence like intravascular invasion on histological examination, the biological behavior of this tumour has been found to be mostly benign to less malignant with rare metastases[1,2,3,4].

The dogs with cryptorchid testes have been found be at an increased risk and 15 times more prone to this tumour development[5,6]. The mean age of the affected dogs was observed to be 10 years[7]. Among various breeds affected, Golden Retriever, English Cocker Spaniel, Sheltie, Collie, Boxer, German Shepherd, Fox Terriers, Afghan Hounds and Norwegian Elkhounds have been found to be more susceptible than mixed breed dogs. Exposure to environment contaminated with pesticides and chemicals such as diethylhexyl phthalate (DEHP) and polychlorinated biphenyl 153 (PCB153) could also pose an increased risk to this tumour development[8]. The main clinical finding is enlargement of testicles in affected animals. However this enlargement may not be readily apparent in case of cryptorchid dogs which show no clinical signs[7]. Feminization syndrome, prostatitis, prostrate hyperplasia and perianal adenoma have also been recorded in some dogs affected with seminoma[9]. Although adequate reports are available on incidence of seminoma in dogs, records pertaining to cytological diagnosis are scanty. Hence the present study reports a case of seminoma which was confirmed cytologically.

A 10-year-old intact male Spitz dog was presented at Sanchu animal hospital, Chennai for diagnosis and treatment with the history of unilateral scrotal swelling since few months. A thorough physical examination was carried out on affected animal. Blood samples were collected for hematobiochemical studies. For hematological studies, blood samples were collected in vacutainers containing EDTA as anticoagulant while for biochemical estimations, serum was separated from the clotted blood samples after centrifugation @ 3000 rpm for five minutes. In addition, fine needle aspiration smears prepared from the affected testis were air dried and stained with Leishman and Giemsa cocktail stain for cytological examination[10].

How to cite this article : Ramesh, S., Vijayendran, V., Balakumar, A. and Kumar, V. 2025. Cytological diagnosis of seminoma in dog. Indian J. Vet. Pathol., 49(3) : 250-253.

Physical examination of the affected dog showed a marked enlargement of left testis with peeling of skin covering the testis due to frequent licking. On palpation of the affected testis, mild pain was evinced. No enlargement of regional lymphnodes was noticed. Hematological studies showed no abnormal changes except mild anemia while biochemical estimations revealed an increase in serum total protein and globulin and a decrease in A/G

ratio (Table 1 and 2). Cytological examination of the aspirated smears from the affected testis was suggestive of seminoma which revealed moderate cellularity with cells being discrete, round to ovoid and exhibiting moderate pleomorphism. The cytoplasm was sparse to moderate in amount and showed mild basophilia. The nuclei were prominent, large and spherical to ovoid in shape with coarsely reticular chromatin. In many areas, binucleate and multinucleate cells were present. In addition, mitotic figures were seen in some areas (Fig. 1-6). In few areas, lymphocytic and neutrophilic infiltrations were also observed. Based on the cytological findings, the mass was identified as seminoma.

The clinical findings namely unilateral involvement of testis and non involvement of regional lymphnodes noticed in the present case correlate well with that of previous worker[3] who also observed similar findings in a nine-year-old boxer dog. The involvement of left testis in the present study was also reported in a 10 years old golden retriever affected with seminoma[11]. In contrast to the present findings, an increased incidence of seminoma affecting right testicle has been frequently reported[3,9,12,13]. Testicular enlargement which is the major feature of seminomas is usually unilateral but occasionally bilateral[9]. However, fifty percent of dogs affected with testicular tumours revealed bilateral involvement[14].

The present findings of mild anemia with normal leukocyte and platelet counts were also reported in a nine year old male boxer affected with seminoma[3]. However, they recorded no abnormal findings in serum biochemical parameters.

Table 1. Haematobiochemical parameters of the dog affected with seminoma.

S.No.	Parameters	Values	Reference range[16]
1.	Haemoglobin (g/dL)	11.80	11.90-18.90
2.	PCV (%)	36.10	35-57
3.	RBC (millions/cumm)	5.69	4.95-7.87
4.	MCV (fL)	63.60	66-77
5.	MCHC (g/dL)	32.6	21.0-26.2
6.	MCH (pg)	20.70	32.0-36.3
7.	Total leukocyte count (x10^3/mcL)	12.5	5-14.1
8.	Differential leukocyte count (%)		
	Neutrophil	71	58-85
	Lymphocyte	20	8-21
	Monocyte	5	2-10
	Eosinophil	4	0-9
9.	Thrombocyte count (x10^3/mcL)	250	211-621
10.	BUN (mg/dL)	28.70	8-28
11.	Creatinine (mg/dL)	1.65	0.5-1.7
12.	BUN/Cr ratio	17.40	10-20
13.	Glucose (mg/dL)	78	76-119
14.	Phosphorus (mg/dL)	5.1	2.9-5.3
15.	Total bilirubin (mg/dL)	0.3	0-0.3
16.	Calcium (mg/dL)	9.20	9-11
17.	GGT (IU/L)	7.00	5-14
18.	ALT (IU/L)	30	10-109
19.	ALP (IU/L)	58	1-114
20.	Total protein (g/L)	11	5.4-7.5
21.	Albumin (g/L)	2.60	2.3-3.1
22.	Globulin (mg/dL)	8.4	2.7-4.4
23.	A/G ratio	0.30	
24.	Total cholesterol (mg/dL)	212	135-278

The cytological findings noticed in the present study were also recorded in a nine-year-old seminoma affected boxer dog[3], were in the tumour revealed moderate cellularity with cells of varying sizes and varying amount of bluish cytoplasm. Nuclei were large, round to oval and hyperchromic with fine to coarse chromatin containing prominent multiple nucleoli and mitotic figures as seen in the present study.

Aspiration smears from the mass of seminoma generally contains moderate to large number of neoplastic cells of varying sizes and varying amount of lightly basophilic and homogenous cytoplasm. The nuclei may be multiple and homogenous to finely reticular containing relatively large nucleoli with mitotic figures[9].

Cytological smears of seminoma often reveal large number of lysed cells and free nuclei. The neoplastic cells appear large, round and either discrete or in small aggregates. The nuclei may also appear large and round with reticular to coarse chromatin and prominent nucleoli. In addition moderate anisocytosis, anisokaryosis, binucleation, multinucleation and aberrant mitoses may also be observed. The cytoplasm may exhibit mild to moderate basophilia with rare vacuolations. Nuclear cytoplasmic ratio may be moderate to high. Small lymphocytes are frequently observed. The presence of lacy granular eosinophilic material giving a tigroid appearance may be occasionally seen[15]. In addition mitotic figures are frequently seen. Granular lacy eosinophilic background giving a tigroid appearance along with lymphocytes and aypical mitoses are diagnostic features of seminomas[9].

Financial support & sponsorship: None

Conflicts of Interest: None

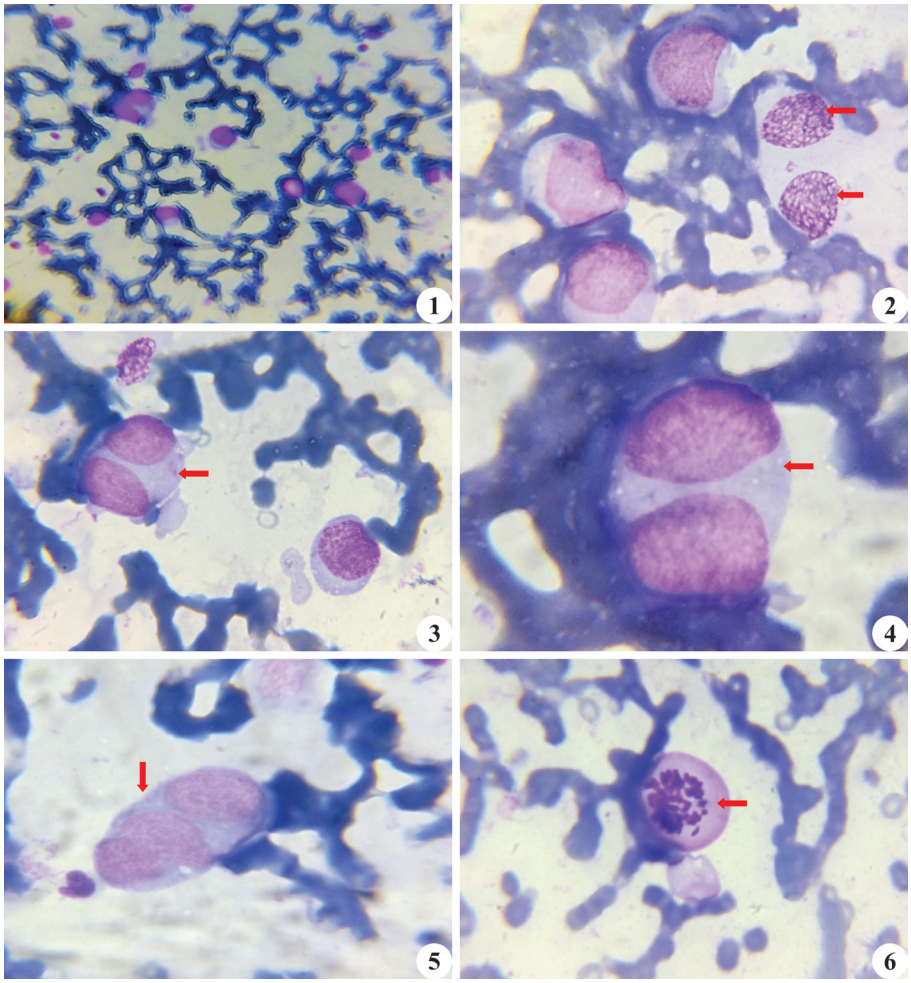

Fig. 1 & 2. Seminoma: Moderate cellularity with discrete, round to ovoid cells exhibiting moderate pleomorphism (FNAC - L&G staining x200); **Fig. 3 & 4.** Binucleate cell with coarse chromatin and varying amount of lightly basophilic homogenous cytoplasm (FNAC - L&G staining x1000); **Fig. 5.** Multinucleate cell with coarse chromatin and prominent nucleoli (FNAC - L&G staining x1000); **Fig. 6.** Seminoma neoplastic cells-mitotic figure (L&G staining x1000).

Use of Artificial Intelligence (AI)-Assisted Technology for manuscript preparation: The authors confirm that there was no use of AI-assisted technology for assisting in the writing of the manuscript and no images were manipulated using AI.

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