

Cytological diagnosis of transmissible venereal tumour in a dog - A report

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ABSTRACT

A six months old mongrel dog was presented at Sanchu Animal Hospital, Velachery, Chennai for diagnosis and treatment with a history of bleeding from the prepuce and presence of cauliflower like growth on the penile region. Physical examination of the affected dog showed numerous cauliflower growths around the bulbus glandis of the penis. Haematological examination revealed mild leukocytosis accompanied by mild neutrophilia and eosinophilia. Cytological examination of impression smears taken from the mass revealed the presence of numerous discrete round cells with characteristic cytoplasmic vacuolations, suggestive of transmissible venereal tumour. Based on the laboratory findings, the affected dog was treated with vincristine sulphate along with multivitamin syrup and herbal liver tonic. The treated dog showed marked regression in growth after two weeks of treatment. Thus, the present study reports a case of transmissible venereal tumour based on the cytological examination of nodules present on the penile region of a dog.

Keywords: Cytology, mongrel dog, TVT, vincristine

Canine transmissible venereal tumor (TVT), also known as Sticker's sarcoma is a highly contagious venereal tumor of mesenchymal origin affecting dogs and other canine species including foxes, coyotes and wolves. TVT has been reported in dogs since many decades and it is mostly recorded in sexually active free-roaming dogs in tropical and subtropical regions. It's incidence is more common in dogs belonging to the age group of 1-5 years. Venereal transmission is most common but transmission also occurs through licking, biting, and sniffing the affected areas^{1,2}.

The clinical finding recorded in dogs affected with TVT includes presence of a solitary or multiple cauliflower-like growths with the size measuring from 5 mm to more than 10 cm in diameter. Though these lesions are mostly restricted to the external genitalia, they are also seen on the extragenital areas namely skin, nostrils, oral cavity, eye ball, eyelids and anus. The other clinical findings are oozing of blood from the affected area, serosanguineous secretions with intense odor, deformity, ulceration, and possibly areas of necrosis. Usually, the tumor does not metastasize to distant organs except in young and immune incompetent animals³. However, in some cases, metastasis can occur to the skin, inguinal lymph nodes, liver, kidneys, spleen, intestine, heart, brain, lungs, and other organs. Diagnosis is usually made based on the clinical, cytological and histological findings^{3,4}. Of various therapeutic measures adopted namely complete surgical excision of the mass, radiotherapy, and chemotherapy, latter has been shown to be the most effective and easily available. Among various chemotherapeutic agents used, vincristine sulphate has been found to be highly effective in majority of cases and complete regression of tumour occurs in two to four doses⁵. However if chemotherapy is not effective, radiotherapy has been reported to give successful results^{6,7,8}. Though numerous reports are available on incidence of TVT in young and adult dogs, it's incidence in dogs which are less than one year old is scanty. Hence the present paper reports an incidence of TVT diagnosed on cytological examination in a six months old mongrel dog.

A six months old male mongrel dog was presented at Sanchu Animal

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Hospital, Velachery, Chennai for diagnosis and treatment with a history of bleeding from the penis and presence of growths on the penile region. A thorough physical examination was carried out on ailing animal and blood samples were collected in vacutainers containing EDTA as anticoagulant for haematological studies. In addition, impression smears were prepared from the mass, air dried, and stained with Leishman and Giemsa cocktail stain for cytological examination⁹. Based on the laboratory findings, the case was diagnosed as TVT and the dog was treated intravenously with vincristine sulphate @ 0.025 mg/kg body weight at weekly intervals for two weeks. In addition, multivitamin syrup (Hemobest syrup®) and herbal liver tonic (Revell syrup®)

were prescribed to administer orally twice daily for four weeks.

Physical examination of the affected animal revealed presence of pinkish multiple cauliflower like growths which were friable with the size measuring from 5 mm to 2 cm in diameter around the bulbus glandis of the penis (Fig. 1). Haematological examination revealed mild leukocytosis accompanied by mild neutrophilia and eosinophilia (Table 1-3). Cytological examination of the smears were suggestive of transmissible venereal tumour which revealed numerous discrete round cells containing moderate amount of pale bluish granular cytoplasm with distinct borders. The cytoplasm of few cells showed characteristic punched out vacuolations. The nuclei which were coarse and round to oval in shape were placed either at centre or slightly at the periphery of the cells. The treated dog showed marked regression in growths after two weeks of treatment.

The present clinical findings which revealed multiple cauliflower like friable growths on the penile region of a non descript dog affected with TVT were in accordance with that of previous workers^{10,11} who also reported cauliflower

like growth in the penile region in non descript dogs affected with TVT.

The haematological alterations which include mild leukocytosis accompanied by mild neutrophilia recorded during the present study was in agreement with that of earlier workers¹² who also observed leukocytosis accompanied by neutrophilia in dogs affected with TVT. They opined that the abnormal findings in haematological parameters are one of the common paraneoplastic syndromes which result from neoplastic infiltration of bone marrow, dysfunctioning of spleen or from immune mediated abnormalities.

The cytological findings of numerous discrete round cells with moderate amount of pale cytoplasm with

Table 1. Erythrogram.

Parameters	Results	References ¹⁹
Haemoglobin (g/dl)	16.70	11.90-18.90
Packed cell volume (%)	51.00	35-57
Red blood cells ($\times 10^6/\text{mCL}$)	7.56	4.95-7.87
MCV (fl)	67.50	66-77
MCHC (g/dl)	32.70	21.0-26.2
MCH (pg)	22	32.0-36.3

Table 2. Leukogram.

Parameters	Results	References ¹⁹
Total leukocyte count ($\times 10^3/\text{mCL}$)	16.90	5-14.1
Differential leukocyte count (%)		
Neutrophil	77	58-85
Lymphocyte	17	8-21
Monocyte	05	2-10
Eosinophil	15	0-9

Table 3. Thrombogram.

Parameters	Results	References ¹⁹
Thrombocyte count ($\times 10^3/\text{mCL}$)	476	211-621

vacuolations and eccentrically placed nucleus recorded during the present study were in accordance with that of previous workers¹⁰ who noticed similar observations in an adult non-descript dog affected with TVT. Similar findings were also reported in a 4 years old intact Pit Bull dog¹³ and in a three year old male mongrel dog¹¹ affected with TVT. The presence of characteristic multiple cytoplasmic vacuoles with large foamy nuclei are the common features of TVT cells on cytological examination¹⁴ as noticed in the present study.

Cytological examination revealed characteristic round cells with slightly acidophilic cytoplasm containing finely granular and delicate vacuoles. The cytoplasmic borders were distinct containing centrally placed nuclei which

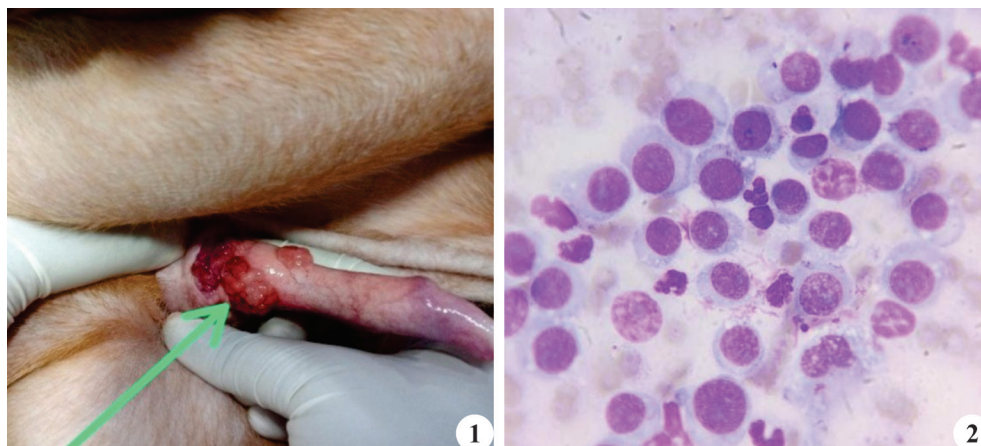


Fig. 1. Mongrel Dog - TVT showing cauliflower like growths at the base of the penis after one week of treatment with vincristine; **Fig. 2.** Impression smear of a mongrel dog - TVT showing numerous round cells containing oval to round nuclei with punched out vacuolations in few cells (L&G stain X100).

were oval or round in shape with delicate chromatin and large nucleoli. In addition, cells displayed anisokaryosis, anisocytosis, hyperchromasia or nuclear macrokaryosis and frequent typical or atypical mitoses which were indicative of tumour cells proliferation^{15,16}. Numerous apoptotic bodies were also observed in the regression phase. Inflammatory cells such as lymphocytes, plasma cells, macrophages and neutrophils were noticed irrespective of stages of neoplastic development¹⁷.

During the present study, administration of vincristine sulphate @ 0.025 mg/kg body weight intravenously at weekly intervals resulted in marked regression of tumour after two weeks of treatment. A complete regression of growth after four weeks of treatment with vincristine was recorded in three German Shepherd dogs affected with TVT⁵. However, complete regression of tumour was noticed only after six weeks of treatment with vincristine in a two years old male Doberman dog¹⁸ and after five weeks of treatment in a 4 years old Pit Bull dog¹¹ affected with TVT. Thus, the present study confirms a case of TVT in a six months old mongrel dog based on cytological diagnosis and its successful treatment with vincristine.

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