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Transmissible venereal tumor and its successful treatment in canines

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Abstract

28 dogs of various breeds with a history of bleeding, in-appetence, and polydipsia were brought to the VCC, IIVER, Rohtak during the course of a year. 13 males and 15 females between the ages of 18 and 24 months made up the 28 animals. Upon clinical inspection, it was found that the animals had cauliflower-like tumorous growths on their penis in the case of males and their posterior vagina in the case of females. In all cases, neutrophilia was visible on the blood image. By microscopic examination of an impression smear stained with Leishman's stain, TVT was identified in each case. Vincristine sulphate, chlorpheniramine maleate, multivitamins, and immunity-booster syrup are all included in the treatment regimen. After the initial therapy shot, bleeding ceased, and all animals' gross tumor lesions started to diminish within 15 days.

Keywords: TVT, canine, vincristine, neutrophilia

Introduction

Transmissible Venereal Tumour (TVT) is a benign reticulo endothelial tumor of the canidae family that is primarily found in the external genitalia of sexually developed animals. TVT can have an impact on wild canids as well. Infectious sarcoma, venereal granuloma, transmissible lymphosarcoma, and sticker tumor are other names for it. The mucosa of the penis or vagina is typically affected, whereas the nasal passage and oral cavity are less frequently affected (Sharma *et al.*, 2012; Gurel *et al.*, 2002) ^[16, 7]. The most frequent canine tumor, TVT, affects all dog breeds in areas with tropical and subtropical climates (Das and Das, 2000; Goldschmidt, 2002) ^[4, 6].

TVT poses serious problems and worries all around the world since it affects male and female canines equally. Animals with impaired immune systems are more likely to experience more severe illnesses. The ability of the host immune system to respond effectively is key to the growth of these tumors. It is a tumor that develops naturally. According to Murgia *et al.* (2006) ^[12], it is a highly contagious malignancy that is horizontally transferred and spreads by coitus. The external vaginal mucous membranes of dogs of all breeds are most commonly affected by the small tumor lesion that eventually grows into a big, infected, ulcerated mass (Das and Das, 2000) ^[4] with hemorrhagic discharge that has an awful odor (Do Amaral *et al.*, 2007) ^[5].

Contrary to the usual chromosome number of 78, which has two acrocentric chromosomes, TVT has 58–59 chromosomes, 13–17 metacentric chromosomes, 42 acrocentric chromosomes, and 42 acrocentric chromosomes. Surface antigen traits imply that a single primary canine tumor gave rise to all TVTs. Due to the fact that intact live cells are transferred during coitus and pass through MHC (major histocompatibility complex) barriers within the same species, young and sexually mature animals are more susceptible to TVT (Mukaratirwa and Gruys, 2003) ^[11]. By inoculating the tumoral cells, canine TVT can be transplanted from one vulnerable host to another. Although the tumor could not always be spread by cell-free extracts, the presence of cytoplasm in the tumoral cells suggested a viral etiology. Any mucosal lesion or lack of mucosal integrity can aid in the tumor's ability to implant itself (Vermooten, 1987) ^[19]. After implantation, the tumor begins to grow 15 to 60 days later. TVTs can either develop slowly and erratically over many years or become invasive, turn malignant, and spread (Lombard 1968; Moulton 1978) ^[9, 10].

Given that TVTs are immunogenic tumors, it has been established that the host's immune system plays a critical role in preventing tumor growth and metastasis (Cohen, 1973; Cohen, 1985) ^[1, 2]. Less than 5–17% of TVT cases have been documented to have metastases (Richardson 1981; Rogers 1985) ^[14, 15].

Materials and Methods

28 canines between the ages of 2-4 years were brought into the clinic with a one-month history of vaginal bleeding in females and penile bleeding in males. Seven of the 28 animals had already received antibiotic, styptic, and multivitamin treatments from neighborhood veterinarians and para-vets. The remaining cases received no medical care. All 7 of the previously treated cases showed no sign of improvement. All the animals underwent clinical examinations. Rectal temperature, heart rate, and pulse were measured, and all three measures were within the range considered to be normal physiologically for this specific species. On the penis of male dogs, several small nodular lesions were visible (Fig. 1).

Similar gross appearance of tumors was recorded in bitches. In bitches these tumors were mostly located in vestibule and/or caudal vagina (Fig.2). In three cases tumors protruding from the vulva also noticed.

EDTA vacutainers were used to collect blood samples for hematology. Blood hemoglobin levels were discovered to be within the normal range. In all 28 cases, impression smears were created and inspected under a microscope. Multiple cytoplasmic vacuoles that are suggestive of TVT were found in the cytoplasm of the cells upon microscopic analysis of dyed slides (Fig. 3). Treatment for all 28 patients comprised strict intravenous administration of the anti-cancer medication vincristine sulphate @ 0.025 mg/kg diluted in 10 ml of normal saline on a weekly basis for five weeks. Immunity boosters and multivitamin syrup are examples of supportive therapy. Avil injection @ 0.2 mg/kg was also administered to check for any medication reactions.

Results and Discussion

The medication had a beneficial effect on every dog. After receiving the first dosage of vincristine sulphate, bleeding ceased. After receiving therapy with vincristine sulphate, some dogs exhibit gastrointestinal symptoms like vomiting. To treat those symptoms, antiemetic medications were given to the patients. After receiving treatment for a week, blood samples were once more tested for haemoglobin levels and found to fall within the normal range. In every case, the tumorous mass begins to retreat and disappears entirely after 4 weeks of therapy.

Each dog made a full recovery. In every instance, the owner was urged to keep their pets separate from stray dogs to prevent random breeding.

A naturally occurring allograft is the transmissible venereal tumor (Das & Das, 2000) ^[4]. Neoplastic cells can exfoliate and transfer during mating or while the afflicted genitalia are being licked. The majority of transmissible venereal tumors form in the genitalia of both sexes and are typically regarded as benign tumors.

The incidence of metastasis is quite low and occurs in 5 % or less of the cases (Sharma *et al.*, 2012) ^[16]. The main mode of transmission is physical contact onto the genital mucosa, and also onto nasal or oral mucosa (Cohen, 1985) ^[2]. In the present study the localisation of the mass in the genital organs indicated the same. The hemato-biochemical parameters were within the normal range in these dogs which was in agreement with Das *et al.*, 1991 ^[3]. The dogs were treated with vincristine sulfate @ 0.5mg/kg per m² intravenously along with fluids at weekly intervals for four weeks. before every chemotherapeutic protocol haematology and biochemical parameters were taken and they were found within normal limits (Das *et al.*, 1991) ^[3]. The mass completely regressed after 4 doses, but as a precaution the animals were given the 5th dose also. All the dogs went into remission without any relapse after five doses. Transmissible venereal tumor mostly develops in the genital organs of both sexes and is generally considered as a benign tumor. The incidence of metastasis is quite low and occurs in 5 % or less of the cases (Sharma *et al.*, 2012) ^[16]. Definitive diagnosis is based on physical examination and cytological findings, which are obtained through swabs, fine needle aspirations or imprints of the tumor (Kroger *et al.*, 1991) ^[8]. The diagnosis in the current study was made based on clinical symptoms and was supported by an inspection of impression smears. TVT has been treated with a variety of methods, including surgery, radiation, immunotherapy, biotherapy, and chemotherapy (Pigatto *et al.*, 2011) ^[13]. According to the current research, the tumor completely recovered after a four-week schedule of vincristine sulphate intravenous injection at 0.025 mg/kg I/V alone. According to Tella *et al.* (2004) ^[17-18], a full recovery generally takes 2 to 8 injections, while in the current study it takes only 4 weeks.

In none of the cases was there a recurrence noted. In the event of failure, doxorubicin chemotherapy may be combined with radiotherapy (Pigatto *et al.*, 2011) ^[13]. Vincristine side effects such myelosuppression, gastrointestinal issues, and paresis from peripheral neuropathy have been linked to and may happen in 5 to 7% of individuals (Tella *et al.*, 2004) ^[17-18]. A frequent complication of IV medication delivery is the emergence of local tissue responses brought on by extravasation of the drug (Pigatto *et al.*, 2011) ^[13]. No local tissue reactivity was seen in the current investigation.

Table 1: Hematological comparison (Mean ± SE) of animals before and after treatment

Blood Parameters	Before treatment	After Treatment	Overall mean
Hb	8.65 ±0.21	8.65±0.23	8.65±0.15
TLC	14.28±1.44	16.00±0.91	15.14±0.85
Neutrophils	64.70±2.60	61.50±1.93	63.10±1.62
Lymphocytes	25.90±2.88	29.00±1.71	27.45±1.67
Monocytes	6.00±0.47	6.30±0.49	6.15±0.33
Eosinophils	3.40±0.42	3.20±0.44	3.30±0.30
Basophils	0.00±0.00	0.00±0.00	0.00±0.00

No significant difference ($p > 0.05$) was observed in blood parameters before and after treatment.

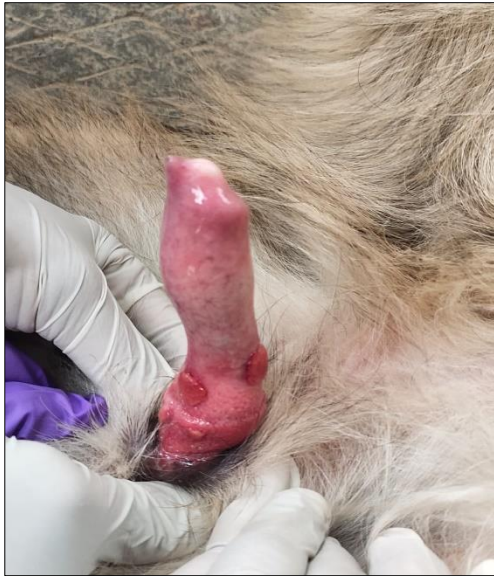


Fig 1: Tumor mass at base of penis



Fig 2: Cauliflower like growth in vagina

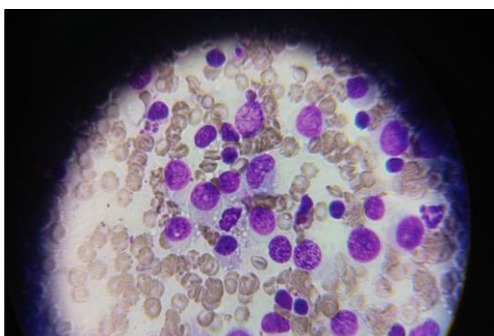


Fig 3: Microscopic picture showing cytoplasmic vacuoles

Conclusion

TVT is a typical genital organ tumor that affects male and female canines equally frequently. Hemorrhagic discharge is the primary owner complaint. The diagnosis is made based on common cytological and physical features. Cytoplasmic vacuoles are among the microscopic results that are most reliable. The most efficient and practicable treatment has been demonstrated to be weekly IV vincristine injection. rigorous I/V route with vincristine sulphate at 0.025 mg/kg for 4 weeks. Clinicians and owners must weigh the benefits

to the patient against the desire to use the animal for breeding until enough data on reproductive impacts is available.

Conflict of interest

The authors have no conflict of interest regarding publishing of the article.

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