



## A Brief Introduction to Canine Transmissible Venereal Tumor (TVT)

Neeteesh Kumar<sup>1</sup>, Surya Kant\*<sup>1</sup>, Akshit Tyagi<sup>2</sup>, K. D. Singh<sup>3</sup>, A. K. Verma<sup>3</sup> and Vikas<sup>4</sup>

<sup>1</sup>PhD Scholar, Department of Veterinary Pathology

\*<sup>1</sup>PG Scholar, Department of Livestock Production Management

<sup>2</sup>PG Scholar, Department of Veterinary Pathology

<sup>3</sup>Assistant Professor, Department of Livestock Farm Complex

<sup>4</sup>PG Scholar, Department of Livestock Production Management

College of Veterinary Science & Animal Husbandry, A.N.D.U.A.T., Kumarganj,  
Ayodhya, U.P. – 224229

<https://doi.org/10.5281/zenodo.10933617>

### Introduction

The various appellations for this infectious tumor include sticker sarcoma, transmissible venereal granuloma, infectious granuloma, canine condyloma, and infectious lymphosarcoma. Transmissible Venereal Tumor (TVT) is most commonly observed in sexually active canines. This neoplasm usually spreads during sex and affects the external genitalia first, sometimes the internal genitalia as well. Young animals that are sexually active have a higher incidence of it. TVT is a benign reticuloendothelial tumor; however, it distinguishes itself due to its infrequent metastasis, especially in animals with weakened immune systems. It is noteworthy that TVT cells exhibit an aberrant chromosome count of 57–64, with an average of 59 chromosomes, which differs from the normal canine breed average of 78 chromosomes. The only known instance of a naturally occurring tumor that can be transferred as a xenograft through cell transplantation and grow independent of its original host is a transmissible venereal tumor.

### History

The first documentation of Canine Transmissible Venereal Tumor (CTVT) date back to the early 1800s. A London veterinarian described it as a "ulcerous state" with a "fungus excrescence" in the reproductive organs in 1810. Among dogs that travel freely in India, unregulated mating is rampant, and CTVT is the most common transmissible tumor there. This malignancy is common in tropical and semi-tropical areas, showing a negative interaction with geographic latitude and a positive correlation with annual temperature and rainfall. The role of uncontrolled mating is highlighted by prevalence studies, which show a higher frequency in



locations with dogs that wander freely. On the other hand, procedures like spaying and neutering can contribute to lowering the frequency of CTVT.

### **Etiology**

Transmissible Venereal Tumor (TVT) has been exacerbated by ageing, immune suppression-promoting environments, and the sharp increase in the number of stray dogs on the streets. Canines with weakened immune systems are especially vulnerable to the fast growth and spread of tumors. TVT is more common in dogs whose immune systems are compromised. A weakened immune system is essential for both contracting and spreading TVT.

TVT is transferred by sexual activity, direct contact with the affected tumor through grooming, such as licking, sniffing, biting, or scratching the mother of the puppies.

### **Signs and symptoms**

1. The bleeding was seen instantaneously as a clinical symptom.
2. Lesions were restricted to the preputial area, base, shaft, and glans of the penis in males.
3. The primary tumor locations in females were extra-vaginal, inside the vagina, vulva, and vulvovaginal regions.
4. Sometimes the lesions from Transmissible Venereal Tumor (TVT) appear outside of the vaginal area. Clinical diagnosis becomes more difficult in cases of extra-genital localization. Several signs and symptoms, including as exophthalmos, skin lumps, deformities of the mouth or face, and enlargement of the lymph nodes in the affected area, can be displayed by TVTs. The wide range of complaints makes it more difficult to diagnose TVT clinically when it manifests outside of the genital area.
5. Based on a macroscopic point of view, tumor masses might appear as either single or many, exhibiting cauliflower-like growth, ulceration, hemorrhagic, friable, and irregular characteristics. The fragility and predominantly hemorrhagic nature of lesions can be attributed to the little cohesiveness observed among neoplastic cells.
6. The growth pattern of canine transmissible venereal tumor (CTVT) can be detected in both naturally occurring and experimentally produced cases, characterized by several phases: progressive, stable, and regression.
7. The dimensions of tumors range from millimeters (mm) to several centimeters (less than 1 to 3 mm in diameter), exhibiting a coloration that fluctuates between dark red and greyish pink. The lesions exhibit a modest diameter ranging from 1 to 3 mm, are superficial in nature, and display a pink to red coloration during the initiation of tumor development. The masses exhibit a diameter ranging from 5 to 7 cm, and then progress into the mucosa as multilobular subcutaneous lesions, surpassing a diameter of 10-15 cm.



Malignant tumors exhibit a propensity for bleeding and tend to undergo ulceration and contamination whenever they undergo growth.

### Diagnosis

1. Historical background.
2. Clinical Examination: Detection of distinctive abnormalities on or in the vicinity of the genital region.
3. In circumstances of extra-genital localization, it is important to evaluate additional clinical indicators, including regional lymph node enlargement, exophthalmos, skin lumps, and facial and mouth abnormalities.
4. The cytological analysis involves the utilization of fine-needle aspiration or biopsy approaches to examine the tumor. Detection of distinctive spherical cells with a conspicuous nucleus, frequently arranged in groups.
5. Histological Investigation: The tumor tissue is removed for histological examination using biopsy. Under a microscope, tissue sections are examined to confirm the existence of TVT and rule out other possible malignancies.
6. Immunohistochemistry is employed as a means to validate the existence of tumor-associated neoplasms (TVT) by identifying distinct markers linked to the tumor.
7. Polymerase Chain Reaction (PCR) is a molecular technique that may be utilized for the detection of certain DNA sequences known as TVT, hence offering a diagnostic procedure that is characterized by a high level of accuracy.
8. Radiographic and imaging tests are employed in instances where the Tumor extends beyond the genital region to evaluate the magnitude of the Tumor and its influence on



**Image credit:** <https://missionpawsible.org/why-sterilise-your-pets/>



adjacent anatomical tissues. These studies may involve the utilization of X-rays or ultrasounds.

### Therapeutic intervention

- ✓ Chemotherapy: the most suggested therapy for CTVT
- ✓ Immunotherapy
- ✓ Radiation therapy
- ✓ Excision of the neoplasm mass surgically: Effective only in tiny, localized tumors; in cases where the tumor has spread, there is a probability of recurrence.

### Prevention Strategies

- ✓ **Spaying and neutered:** The sterilization of dogs lowers the chance of uncontrolled mating and CTVT transmission by attempting to manage the prevalence of stray dogs.
- ✓ **Encourage appropriate breeding techniques** to prevent the unintended spread of CTVT throughout mating.
- ✓ Implementing programmes to manage and control stray dog populations in urban settings, where there is a higher risk of CTVT transmission, is one way to control the stray dog population.
- ✓ **Limitation of Contact:** Preventing direct contact—such as licking, biting, scratching, or sniffing—between canines that are infected and those that are not, especially while mating.
- ✓ **Periodic Veterinarian Inspections:** Frequent veterinary checkups are necessary to identify and treat possible cases of CTVT early on.
- ✓ **Public Awareness and knowledge:** Informational efforts aimed at educating dog owners, breeders, and the broader public about the dangers, signs, and precautions associated with canine viral transmission (CTVT).
- ✓ **Boosting Immunological Well-being:** Methods to improve dogs' immune systems generally may lessen their vulnerability to CTVT.
- ✓ **Health Surveillance in Endemic Areas:** In regions where CTVT is endemic, there is heightened health surveillance with an emphasis on early detection and management.
- ✓ **Steps for Confinement:** Isolating and holding diseased canines in quarantine to stop the virus from spreading to healthy people.

### Conclusion

Transmissible Venereal Tumor (TVT) is a contagious cancer or tumor growth that primarily affects dogs and is transmitted through mating or direct contact with infected dogs. The prevention of TVT heavily relies on spaying and neutering dogs, which eliminates the risk of mating and transmission. Responsible breeding practices, such as avoiding breeding dogs with a



known TVT history and maintaining proper hygiene during breeding, can also help prevent the spread of the disease.

In terms of treatment, TVT is highly responsive to chemotherapy drugs, particularly vincristine sulfate, which is considered the standard treatment. Chemotherapy is effective in causing regression of the tumor and achieving remission in most cases. Radiotherapy can be used as an alternative or adjunct to chemotherapy in some cases. Surgical removal of the tumor may be considered, but it is not recommended as a sole treatment due to the high risk of metastasis and recurrence.

Early detection and prompt treatment with chemotherapy are crucial for successful outcomes in managing TVT. Regular follow-up and monitoring are necessary to ensure complete remission and prevent recurrence. Additionally, some experimental studies have explored the use of immunotherapy, such as autologous vaccine therapy, as a potential treatment option for TVT.

Overall, the combination of prevention through spaying/neutering and responsible breeding practices, along with effective chemotherapy treatment, has significantly improved the management of TVT in dogs. Continued research and awareness among veterinarians and canine owners are essential for further progress in controlling this unique canine cancer or neoplasm.