

## A CASE STUDY OF CANINE TRANSMISSIBLE VENEREAL TUMOUR IN COMMUNITY DOG

**S. Marahatta, K. Lamsal, R.P Joshi and B. Shrestha\***

Institute of Agriculture and Animal Science, Tribhuvan University, Nepal

\*birendravet069@gmail.com

### ABSTRACT

Dogs the first animals to be associated with humans have suffered most in unplanned urbanised societies. Community dogs are of serious health and safety problems in developing countries and many are seen suffering in the streets with various problems. Canine transmissible venereal tumour (CTVT), an only transmittable oncogenic disease seen frequently in these community dogs. Veterinary Teaching Hospital (VTH) located at Paklihawa Campus, Institute of Agriculture and Animal Science (IAAS). Tribhuvan University (TU) is the major centre for canine health care in Nepal. A dog was brought with complaints of bleeding from the rear and visible reddish mass. The mass in the genital region was diagnosed to be venereal tumour by cell cytology. For the treatment of CTVT, surgical intervention along with chemotherapy (vincristine @0.025mg/Kg) was done. To remove the ectoparasite, amitraz bath and ivermectin (0.2mg/Kg) was used. The dog completely recovered and it was returned in its original territory.

**Keywords:** chemotherapy, community dog, CTVT, surgery, vincristine sulphate

### INTRODUCTION

Canine transmissible venereal tumour (CTVT) is a cauliflower like pedunculate, nodular, multi lobulated benign reticuloendothelial mass affecting the canine specie Isabel et al., (2005) and Hiblu et al., (2019). This tumour is common in canine species, mostly affecting the external genitalia and also occasionally internal genitalia (Isabel et al., 2005). In female canine CTVT is mainly located in the vagina or labia where as in case of male canines this is usually seen on the penis or preputium. CTVT is a unique oncogenic disease as this gets transmitted from one to another during mating (Isabel et al., 2005). Extra-genital form of CTVT is also recorded with the appearance of the tumorous mass on nasal and oral cavity, ocular membrane, skin and rectum. Extra genital form occurs due to licking of the vagina and preputial discharge (Komnenou et al., 2015).

CTVT is usually not a metastatic form, but in the young puppies and immunocompromised dog metastasis is reported with the tumour in inguinal lymph node, pituitary gland, brain and liver (Mukaratirwa & Gruys, 2003). The tumorous mass consists of numerous cells in different phases of mitosis which indicates the rapid increase in number of tumorous cell. Spontaneous recovery of the tumorous mass is also recorded, but this is less frequently seen in the induced or transplanted CTVT than in naturally occurring (Frampton et al., 2018).

Cells of canine transmissible venereal tumour differ from normal somatic cells. Normal canine somatic cells have 78 chromosomes, but these tumorous cells have an abnormal number of chromosomes ranging from 57 to 59 (Thomas et al., 2009). Although no virus has been isolated from these abnormal tumorous cells, but virus like particle has been demonstrated under electronic microscope in few research which could be a cause of the contagious nature of CTVT. It is reported to be antigenic and the amount of this antigen in the blood serum varies with the volume of tumorous mass. The amount of antigen decreases and is not detectable in serum after 48-72 hours of surgical removal of the tumorous mass (Mukaratirwa & Gruys, 2003).

## MATERIALS AND METHODS

### Physical examination

A reddish brown community female, intact, local breed dog weighing 12.8 kg and approximately 2 years old was presented at Veterinary Teaching Hospital (VTH), Paklihawa Campus, Institute of Agriculture and Animal Science (IAAS), Tribhuvan University with a history of ectoparasite infestation and a cauliflower like mass protruding out from its genital opening. The treatment protocol of this case was approved VTH, IAAS and the treatment was done with minimal pain and routing clinical procedure. Being a community dog the history of vaccination and any other medication were unknown.

Visual inspection revealed that the dog was itching, scratching its body with its limbs. Alopecia along with depilation was seen all over the body with the focal patches on limbs, pinna and peri-orbital areas. Physical examination of the dog revealed the normal heart rate (86 beats/Minute), pulse rate (80 beats/Minute), rectal temperature (101.2<sup>o</sup>F) and capillary refill time was less than 2 seconds. A cauliflower like mass was protruding out from its genital opening and slight bleeding was also observed from the protruding mass (Fig:1).

To concise the diagnosis similar other clinical conditions such as vaginal prolapse, mast cell tumour, basal cell carcinoma and lymphoma were also considered. Diagnosis of the CTVT was done on the basis of the physical examination and cell cytology. Treatment protocol followed the surgical removal of the mass along with chemotherapy for the complete removal of the oncogenic cells. Before the surgery haematological profile of the dog was done which is given in table 1.

**Table 1. Haematological profile of the dog prior to surgical excision of hepatoid gland adenoma in German Shepard dog**

Constituent	Test result	Reference value
Red blood cells (RBC)	6.1*10 <sup>9</sup> /l	5-14.1*10 <sup>9</sup> /l
White Blood Cell (WBC)	13.2 *10 <sup>3</sup> /μl	5.0-19.5 *10 <sup>3</sup> /μl
Neutrophil (%)	71	58-85
Lymphocytes (%)	27	8-21
Eosinophils (%)	2	0-9
Platelet	311 * 10 <sup>3</sup> /μl	211-621 *10 <sup>3</sup> /μl
Hemoglobin (g/dl)	17.5	11.9-18.9
PCV%	53.6	35-57
MCV(fl)	88.3	6-77
MCH(pg)	29.8	21.0 - 26.2
MCHC(gm/dl)	34.1	32.0 - 36.3

*Reference value Source: MSD Veterinary Manual*

Before the surgery the dog was restricted to food for 12 hours and to water for 4 hours. Prior to the surgery the dog was sedated with xylazine (0.4 mg/ Kg). Meloxicam (0.2mg/Kg) was used as analgesia, strep to penicillin (15000IU/Kg) was used as antibiotic and ivermectin (0.2mg/ Kg) was used for ectoparasites. After the sedation surgical site was cleaned with normal saline and diluted iodine. For the maintenance of anaesthesia Xylazine and ketamine (1:2) was used. The tumorous mass was emasculated aseptically applying the ligation at the base of the mass. The dog recovered within 10 minutes after the surgery from the anaesthesia

As a post-operative care, a course of antibiotic (Strepto Penicillin @ 15000IU/Kg) and analgesia (Meloxicam @ 0.2mg/Kg) was followed for 5 days. After this period, chemotherapy with vincristine sulphate was performed at the dose rate 0.025mg/Kg, IV (intra-venous) weekly for a month. The drug was diluted with 200ml normal saline. After a week of surgery, amitraz bath (2ml in 1 Liter of water) along with ivermectin (0.2mg/Kg) was given subcutaneously. Chlorpheniramine malate 1mg/Kg BW (body weight) was used intramuscularly twice a day, regularly for five days to prevent the self-scratching and reduce the risk of self-inflicted injury. After the complete therapy the mass regressed and then it appeared normal and the dog was returned to its original territory (this sentence should be included in result and discussion).



Figure 1. Tumorous mass

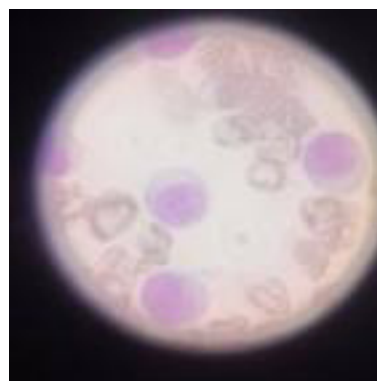


Figure 2. Cell cytology showing large prominent nucleus and vacuolated cells (photograph is not clear, not showing vacuolated mass)

### RESULTS AND DISCUSSION

Community dogs are one of the problems in different cities of Nepal including Bhairahawa. Many of them are seen suffering from different clinical conditions, but only few of them receive veterinary service. CTVT is also a common clinical condition seen among these community dogs. CTVT, appears as a tumorous mass in the genital region of the dogs. This may also appear in other regions such as nose, skin and orbital areas (already mentioned in introduction). Diagnosis of this can be done on the basis of physical examination, clinical signs, cell cytology and histopathology. Cytology of the tumorous cell reveals typical round or polyhedral cells with large round prominent nucleus showing mitotic figures and a thin cytoplasmic vacuole (Martins et al., 2005).

Various method is applied for the treatment of CTVT i.e. Surgery, chemotherapy, immunotherapy and radiotherapy but the most popular are the surgical excision of the tumor's mass (Martins et al., 2005). Beside surgery, chemotherapy is also another popular method used for the treatment of CTVT. Chemotherapeutic drugs such as vincristine, cyclophosphamide or methotrexate are also used and most popular drug among them is vincristine (Mukaratirwa & Gruys, 2003). Vincristine is a plant alkaloid which displays the cytotoxic activity by disorganizing the cellular mycotubule formation which results in hinderance to the tumor cell replication (Hantrakul et al., 2014). Beside the therapeutic effect, vincristine has some side effects too. This drug may cause myelosupression leading to leukopenia and other effects may be peresis and gastrointestinal effect (Isabel et al., 2005).

Community dog does not have proper nutritious food and they become immune-compromised. This condition increases the chance of parasitic infestation and further worsens the condition of these community dogs. If these dogs get infected with CTVT, then the expansion of the venereal tumour further increases in these immune-compromised patients and worsens their condition (Isabel et al., 2005).

### CONCLUSION

CTVT is a one of the most common problems among malnourished and immune-compromised community dog. Tumorous mass is seen generally in the vagina or labia of the female and the penis or preputium of male. It may also affect the skin by the implantation of tumor cells through licking or direct contact following social behavior, in sites where there was a cutaneous lesion, including oral and nasal lesion. Diagnosis of this can be done on the basis of clinical signs and symptoms, cell cytology and histopathology. The best method of treatment is surgical intervention with chemotherapy.

### ACKNOWLEDGEMENT

We would like to acknowledge the staff of VTH, Paklihawa for the facility and support of the surgery process. Dr. Krishna Kaphle, director of VTH deserves special mentioning for providing 24/7 access to clinical service and facility of VTH, IAAS, TU.

### REFERENCES

- Frampton, D., Schwenzer, H., Marino, G., Butcher, L. M., Pollara, G., Kriston-Vizi, J., Venturini, C., Austin, R., de Castro, K. F., Ketteler, R., Chain, B., Goldstein, R. A., Weiss, R. A., Beck, S., & Fassati, A. (2018). Molecular Signatures of Regression of the Canine Transmissible Venereal Tumor. *Cancer Cell*, 33(4), 620-633.e6. <https://doi.org/10.1016/j.ccell.2018.03.003>
- Hantrakul, S., Klangkaew, N., Kunakornsawat, S., Tansatit, T., Poapolathep, A., Kumagai, S., & Poapolathep, S. (2014). Clinical pharmacokinetics and effects of vincristine sulfate in dogs with transmissible venereal tumor (TVT). *The Journal of Veterinary Medical Science / the Japanese Society of Veterinary Science*, 76(12), 1549–1553. <https://doi.org/10.1292/jvms.14-0180>
- Hiblu, M. A., Khabuli, N. M., & Gaja, A. O. (2019). *Canine transmissible venereal tumor: First report of three clinical cases from*. 9, 103–105.
- Isabel, M., Martins, M., Londrina, U. E. De, Souza, F. F., & Gobello, C. (2005). *The Canine Transmissible Venereal Tumor: Etiology , Pathology , Diagnosis and Treatment In : Recent Advances in Small Animal Reproduction , Concannon P . W., England G ., Verstegen III J . The Canine Transmissible Venereal Tumor: Etiology , Pathology , February 2016.*
- Kommenou, A. T., Thomas, A. L. N., Kyriazis, A. P., Poutahidis, T., & Papazoglou, L. G. (2015). Ocular manifestations of canine transmissible venereal tumour: A retrospective study of 25 cases in Greece. *Veterinary Record*, 176(20), 523. <https://doi.org/10.1136/vr.102968>
- Martins, M., Souza, F., & Gobello, C. (2005). *The Canine Transmissible Venereal Tumor: Etiology, Pathology , Diagnosis and Treatment.*

- Mukaratirwa, S., & Gruys, E. (2003). Canine transmissible venereal tumour: Cytogenetic origin, immunophenotype, and immunobiology. A review. *Veterinary Quarterly*, 25(3), 101–111. <https://doi.org/10.1080/01652176.2003.9695151>
- Thomas, R., Rebbeck, C., Leroi, A. M., Burt, A., & Breen, M. (2009). Extensive conservation of genomic imbalances in canine transmissible venereal tumors (CTVT) detected by microarray-based CGH analysis. *Chromosome Research*, 17(7), 927–934. <https://doi.org/10.1007/s10577-009-9080>.