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Management of canine transmissible venereal tumour (TVT) with a combination of vincristine sulphate, dexamethasone and sarolaner in a three-year-old mongrel dog: A case report

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Abstract

Canine transmissible venereal tumour is a round cell neoplasm that is spread by mating and physical transmission of the tumour cells. It is among the most prevalent tumours in dogs. The tumor is commonly observed on the external genitalia, although, there have been reports of internal organ metastases. When affected dogs mate, lick or sniff at the lesion, living tumour cells are spread from one dog to another. A three-year-old female mongrel dog was presented with complaints of discomfort, bloody visible mass on the vagina and frequent licking of the genitalia for over three months, with the history of staying out of the compound during the day, and with heavy tick infestation. The dog was diagnosed of transmissible venereal tumour (TVT) based on the history and clinical manifestation. Further histological and molecular diagnosis was not done, however, the history, vaginal location of the lesion, the gross appearance and the rapid recovery following vincristine sulphate therapy strongly supported the diagnosis of canine TVT. Chemotherapy was initiated by premedication with dexamethasone and sarolaner (Simparica®) tablets, followed by slow intravenous injection of vincristine sulphate, at a dose of 0.025 mg/kg once a week for four weeks. On the third week, the tumour growth regressed markedly and by the fourth week, there was no more manifestation of external genital bleeding. This treatment regimen significantly led to speedy recovery, and reduced treatment period with vincristine sulphate. Its application will possibly reduce the stress and cost of routine vincristine sulphate therapy for TVT, which commonly extends to six weeks.

Keywords: Dog; Transmissible venereal tumour (TVT); Chemotherapy; Vincristine sulphate; Dexamethasone; Sarolaner (Simparica®).

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Introduction

Transmissible venereal tumour (TVT) is among the most uncontrollable neoplasms of dogs, which spread through mating, especially in the young and sexually active dogs (Uçar, 2016). It is a reticuloendothelial tumour that mainly affects the external genitalia and less often the internal genitalia (Abedin, 2020). The disease is most commonly found on the mucosal surface of the external genitalia of male dogs and bitches (Hiblu *et al*., 2019). According to a study conducted in Bhubaneswar, India, TVT accounted for almost 25.5% of all reproductive illnesses (Priyadarshini *et al*., 2021). Also, TVT was responsible for 31.8% of diagnosed tumours in Morocco (Laissaoui *et al*., 2024) and almost 54.0% of canine reproductive disease cases in Nigeria (Ugochukwu *et al*., 2024).

Canine TVT may present a multi-lobulated, papillary, nodular, pedunculated or cauliflower-like appearance. The lesion is usually firm but friable, ranging in size from a small nodule (5 mm) to a huge mass (10 cm). The surface of the tumour bleeds easily and is frequently inflammed and ulcerated (Küçükbekir *et al*., 2021). Lobular masses, which are found in the caudal region of the penis, the posterior region of the vagina, and at the vestibule-vaginal junction, are the most prevalent clinical manifestation. Rapid bleeding from nodular lesions is the most noticeable clinical feature. TVT is also commonly known as infectious lymphosarcoma, canine condyloma, venereal granuloma, infectious granuloma and sticker tumor or sarcoma (Regmi *et al*., 2020).

Various treatments options are currently available for canine TVT, such as surgery, chemotherapy and radiotherapy. The treatment that is commonly used is vincristine sulphate chemotherapy, given once a week for three to six weeks, because it has been clinically proven to be effective and has less serious risks or side effects (Ganguly *et al*., 2016). In the present case report, the dog with TVT was premedicated with dexamethasone and sarolaner (Simparica®) prior to the chemotherapeutic medication with vincristine sulphate. On the third week of treatment, there was almost complete regression of the tumour growth. This achieved remission following a brief, four-week course of chemotherapy with vincristine sulphate plus dexamethasone and sarolaner (Simparica®) premedication raises the possibility that with dexamethasone and sarolaner (Simparica®) premedication, some patients may recover sooner than previously reported, and this could lessen the stress and expense of prolonged vincristine sulphate therapy that often extends to six weeks.

Case Presentation

Case History: The State Veterinary Clinic in Osogbo, Osun State, Nigeria received a case of a 3-year-old female mongrel dog with primary complaint of discomfort, lack of appetite, heavy tick infestation, visible mass on the vagina, blood dripping from the vagina and frequent genital licking for more than three months. The dog also had a history of avoiding the compound during the day. According to medical history, the dog was earlier given the DHLPP (Distemper, Hepatitis, Leptospirosis, Parvovirus, and Parainfluenza) and anti-rabies vaccines.

Clinical Manifestation: The following vital parameters were noted during the clinical examination: Respiration rate – 22 cycles per minute; Pulse rate – 84 beats per minute; and Temperature – 39.1°C. The body weight of the dog was 15kg. Upon physical examination, a cauliflower-like, pedunculated, multi-lobulated mass of approximately 7cm was found around the vaginal opening (Figure 1). There was also bloody discharge and extensive licking around the genitalia.

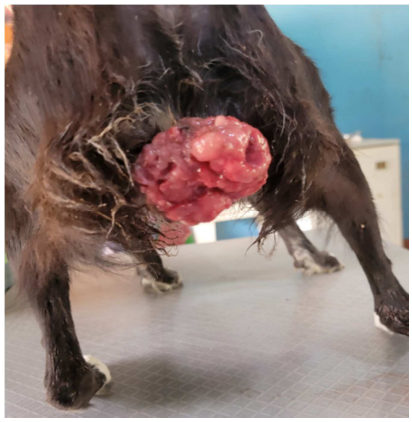

Figure 1. Cauliflower-like, multi-lobulated transmissible venereal tumour mass on the external genitalia of the mongrel dog.

Diagnosis

The dog was diagnosed with transmissible venereal tumour based on the history and clinical manifestation.

Management

Vincristine sulphate therapy was preceded by a three-day regimen of 2 mg/ml dexamethasone injection (Dexanor®, Jubaili Animal Health, Kano, Nigeria) and a single 2 mg/kg tablet of sarolaner (Simparica®, Zoetis, North Ireland, United Kingdom). Chemotherapy for the tumour commenced with a slow intravenous administration of vincristine sulphate (Namacristin®, Naman Pharma Drugs, Mumbai India) at a dosage of 0.025 mg/kg weekly for approximately four weeks. To prevent the disease from spreading throughout the neighbourhood, the owner was advised to keep the dog confined, isolated from other dogs, and to avoid using it for breeding. The tumour mass regressed across the four weeks of treatment (Figure 2).

Discussion

This case report highlights the successful treatment of canine transmissible venereal tumour (TVT) using vincristine sulphate plus premedication with dexamethasone and sarolaner (Simparica®). TVT is a common sexually transmitted neoplasm in dogs, and vincristine sulphate has been established as an effective chemotherapeutic agent for its treatment. Vincristine sulphate as a single drug has been reported to be the most appropriate, safe and successful treatment for TVT in clinical practice (Küçükbekir *et al*, 2021). Vincristine sulphate is employed due to its mild toxicity, reasonably low cost and good performance (expected to eliminate tumors with a 90% success rate) (Woods, 2020). Vincristine sulphate works by preventing cell division and mitosis during the metaphase phase (Said *et al*., 2011).

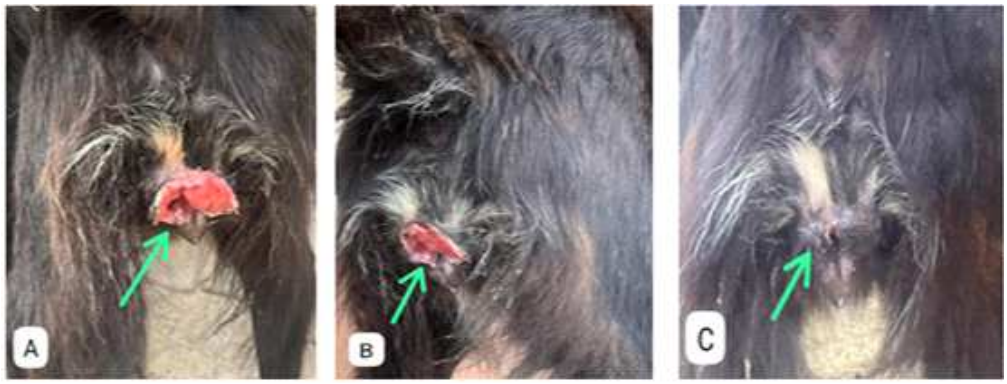

Figure 2. After premedication with dexamethasone and sarolaner (Simparica®) and treatment with vincristine sulphate, the transmissible venereal tumour mass gradually regressed (arrowed) across week 2 (A), week 3 (B) and week 4 (C), and there was no more manifestation of external genital bleeding.

The use of dexamethasone as a premedication in this case aimed to mitigate potential side effects associated with vincristine sulphate, such as gastrointestinal toxicity and myelosuppression. Dexamethasone is a potent synthetic corticosteroid that can help manage various side effects, including allergic reactions and inflammation, which may be associated with vincristine sulphate treatment (Donavon *et al*, 2023). The anti-inflammatory properties of dexamethasone may have also contributed to reducing tumour-related inflammation and improving the patient's quality of life.

Sarolaner (Simparica®), a parasiticide, was used in conjunction with vincristine sulphate and dexamethasone, potentially due to its reported immunomodulatory effects and to control the heavy tick infestation in the dog. While sarolaner's primary mechanism is as an ectoparasiticide, its impact on the immune system can be inferred from its ability to reduce flea allergy dermatitis symptoms in dogs (Kryda *et al*., 2020). Studies have shown that treatment with Simparica® results in rapid resolution of clinical signs associated with flea infestations and flea allergy dermatitis (Kryda *et al*., 2020).

It is believed that the combination of dexamethasone and sarolaner with vincristine sulphate therapy may have enhanced the treatment outcome by targeting the tumor cells and modulating the immune response. The patient's response to treatment, including rapid tumour regression and eradication of the ticks, suggests that the combination of vincristine sulphate, dexamethasone, and Simparica® is an effective and well-tolerated treatment regimen in this patient. However, further studies are needed to confirm these findings and establish the optimal dosing and treatment protocol.

This case report contributes to the growing body of evidence supporting the use of vincristine sulphate as a first-line treatment for canine TVT. The addition of dexamethasone and sarolaner (Simparica®) to the treatment regimen may offer benefits in terms of reducing side effects and improving treatment outcomes. Earlier reports by Purohit (2009), showed that combining vincristine sulphate (0.0125 mg/kg/week, intravenous), methotrexate (0.3 – 0.5 mg/kg/week, intravenous) and cyclophosphamide (1 mg/kg/day) is another method of treating TVT. Four to six weeks was reportedly needed to complete the application (Purohit, 2009). For dogs with TVT, new therapies hold promise, especially for those who have become resistant to previous therapies. For example, in circumstances where vincristine sulphate is not effective, it has been suggested that lomustine may be utilized (Jaman *et al*., 2019). In veterinary practice, lomustine is often used off-label for cancers such as lymphoma, melanoma, mast cell tumours and brain tumours. Its mechanism of action involves disrupting DNA replication and inhibiting cell division, which can help control tumour growth (Jaman *et al*., 2019).

In the present reported case, the cauliflower-like, multi-lobulated tumour mass was notably regressed by the fourth week of treatment; this suggests that some treatment regimens may lead to dogs recovering from TVT earlier than previously reported, and these can help reduce the stress and cost of prolonged therapy.

Conclusion: The present case report demonstrated the potential effectiveness of using vincristine sulphate treatment when combined with dexamethasone and sarolaner (Simparica®) premedication in treating TVT in dogs. While further research is necessary, this report provides valuable insights into the management of this common canine neoplasm and encourages veterinarians to consider this treatment regimen. Future studies should investigate the efficacy and safety of this treatment combination in larger cohort of dogs with TVT, as well as explore

potential applications in other types of canine neoplasms.

Competing Interests

The author declares that there is no conflict of interest.

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