CASE REPORT

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Management of canine transmissible venereal tumour in a four-year-old Nigerian indigenous dog

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Abstract

Canine transmissible venereal tumour (TVT) is a contagious cancer with a global distribution, posing significant challenges in veterinary oncology. A Nigerian indigenous breed of dog was presented with the complaint of blood dripping and tissue growth from the preputial area. A blood sample and a biopsy of the cauliflower-like tissue growth were collected from the patient and analysed for complete blood count and histopathological examination, respectively. Canine TVT was tentatively diagnosed and subsequently confirmed through histopathological examination. Chemotherapy was initiated using Vincristine sulfate (0.025mg/kg intravenously) once per week for four weeks, resulting in a positive outcome. The client was advised not to use the dog for breeding during the management and to confine and isolate the patient from other dogs to prevent the spread of the disease within the community.

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Introduction

A canine transmissible venereal tumour (TVT) is a contagious neoplasm primarily transmitted through coitus, licking, or sniffing as well as contact with injured skin or mucous membranes, affecting dogs. TVT is more common during the dogs' breeding seasons due to an increase in male and female interactions. A study in Bhubaneswar, India, indicated that TVT constituted about 25.46 % of all reproductive diseases and 34.15 % of tumour types in dogs, particularly affecting young female dogs aged two to eleven years (Priyadarshini *et al.,* 2021). In Morocco, TVT accounted for 31.8 % of diagnosed tumours (Laissaoui *et al.,* 2024), while in Nigeria, it represented about 54.0 % of cases of reproductive diseases diagnosed in dogs (Ugochukwu *et al.,* 2024). The tumour is classified into genital and extra-genital types, commonly affecting the penis and prepuce in males and the posterior vaginal area in females. Diagnosis relies on case history, clinical findings, cytological analysis, and molecular techniques. Treatment often includes anticancer drugs such as vincristine sulphate once a week, given for two to six weeks until symptoms resolve. In combination with other drugs (vincristine sulphate (0.025 mg/kg) slowly intravenously, ivermectin (0.3 mg/kg) subcutaneously) has been reported by Avazi *et al*. (2024) with no vincristine sulphate-associated adverse effects as the dogs recovered in 3 weeks post-tumour debulking with no recurrence within 6 months of follow-up examinations. Alternative therapies such as Lomustine may be considered for resistant cases (Palagan & Kardena, 2022) as well as surgical removal is also an option despite potential recurrence. This case management is unique in that it involves an indigenous dog breed and contributes valuable epidemiological data on transmissible venereal tumour (TVT) management in underrepresented regions such as Nigeria. A distinctive feature of this report is the reliance on histopathological analysis, rather than the more commonly used cytology, as the confirmatory diagnostic method, an approach that is rarely documented in resource-limited settings. The detailed histopathological findings provide significant insights into the biological behaviour of TVT in local breeds. This level of pathological detail is seldom explored in similar case reports. The successful remission achieved after a short, four-week course of chemotherapy using vincristine sulphate alone suggests that some cases may respond more rapidly to treatment than previously assumed, and have the potential of reducing both the cost and stress of extended therapy. This report also highlights a public health-oriented approach to TVT management, emphasizing community-level disease control, a perspective often overlooked in existing literature. Interestingly, the dog exhibited a unique haematological profile: it initially presented with leukopenia and lymphopenia but later developed neutrophilic leukocytosis during chemotherapy. This differs from earlier reports that predominantly documented vincristine-induced leukopenia. The rapid tumour regression observed in this case suggests that short-term, low-dose vincristine regimens may be more effective than previously thought, justifying further investigation into optimizing treatment protocols in similar settings.

Case Presentation

Case history

A 4-year-old Nigerian indigenous dog, weighing 20 kg, was presented to the Small Animal Clinic of the Veterinary Teaching Hospital, Ahmadu Bello University, Zaria (VTH ABU). The chief complaint was blood dripping from the prepuce, which had been noticed two days before the hospital visit. The dog's medical history indicated that it had been vaccinated with antirabies and DHLPP (distemper, hepatitis, leptospirosis, parvovirus, parainfluenza) vaccines and was being fed on household food consisting of rice and spaghetti.

Laboratory examination

Clinical manifestation

During the clinical examination, the vital parameters were recorded as follows: temperature at 39.4 ºC (38.5-39.4 ºC), pulse rate at 98 beats per minute (70-90 beats/min), and respiratory rate at 24 cycles per minute (15-30 cycles/minute). Physical examination revealed a cauliflower-like growth measuring 3.1 cm^2 on the surface of the prepuce, with the preputial orifice matted with blood (Plate I). On palpation, there was a popliteal lymphadenopathy (N_1), and the tissue growth size of 3-5cm with minimal invasion (T_2), and no evidence of metastasis (M_0); hence, a clinical diagnosis of TVT at Stage I tumour ($T_2N_1M_0$) was considered.

Investigations

The blood sample was collected from the cephalic vein using a sterile needle and syringe and sent to the Clinical Pathology Laboratory for a complete blood count. The cauliflower-like growth (1cm^2) was excised and transported in 10% buffered formalin for histopathological examination. Cellular infiltrations, vacuolations, tumour cell emboli, numerous round to

oval cells, vacuolation, lymphocytes, giant cells, a high mitotic index, necrosis, and tumour stroma were observed.

Management

Chemotherapy was initiated using vincristine sulphate (Vinlon® Celon Laboratories Ltd., India) at a dosage of 0.025 mg/kg administered intravenously once per week for four consecutive weeks. The client was advised not to use the dog for breeding during the period and instructed to confine and isolate the patient from other dogs to prevent the spread within the community.

Plate I: Cauliflower-like growth on the prepuce of a Nigerian indigenous dog

Discussion

The haematological findings on the first day of the hospital visit revealed leukopenia, lymphopenia, eosinopenia, and monocytopenia as presented in Table 1. These findings could be attributed to high endogenous glucocorticoid concentrations, usually seen in acute inflammation (Maria & Lo, 2016). Following chemotherapy at week 3, the haematological findings revealed neutrophilic leukocytosis, which agreed with Priyadarshini *et al.* (2021), who reported similar findings in dogs with Transmissible Venereal Tumor (TVT). However, this differs from the findings of Anand *et al.* (2023), who noted that vincristine may cause leukopenia and vomiting in approximately 5-7% of patients. The disparity may be attributed to the low dosage and short-term administration of vincristine or the patient's immune status. The decrease in PCV and total protein during the treatment period although within the normal range is due to acute blood loss from the prepuce area. The histopathological analysis revealed cellular infiltrations, vacuolations, and tumour cell emboli (Plate IIA). Numerous round to oval cells, vacuolation, lymphocytes, giant cells, a high mitotic index, necrosis, and tumour stroma were also observed (Plate IIB), confirming the diagnosis of TVT. These findings were consistent with those reported by Bhaskar (2024), who identified round to oval cells, vacuolation, and necrosis in cases of TVT. In week 2, the outcome of the case management indicated that the dog's condition was improving; the dog was eating well and was very active. There was considerable regression of the tumour size, estimated at up to 70% (Plate IIIA). The vital signs recorded were a body temperature of 39.0 °C, a pulse rate of 98 beats per minute, and a respiratory rate of 34 cycles per minute. By week 3, the tumour size had a significant regression of more than 90% (Plate IIIB). This finding is consistent with the reports from Woods *et al.* (2020) who reported tumours can be reduced up to 90% by the third week of treatment. The dog's vital signs showed a body temperature of 38.8 °C, a pulse rate of 90 beats per minute, and a respiratory rate of 32 cycles per minute. Finally, at week 4 of treatment, the dog was presented with no visible sign of the tumour or bleeding from the preputial area (Plate IIIC). The recorded vital signs were a body temperature of 39.1 °C, a pulse rate of 93 beats per minute, and a respiratory rate of 34 cycles per minute. The absence of the tumour signs agreed with the report of Abedin (2020), who noted that the vincristine sulphate injection has proven to be an effective and practical therapy

Table 1: Haematological findings on the day of the first visit and week 3 during chemotherapy

Parameters	Week 0	Week 3	Reference range
PCV (%)	43	39	37 – 55
Total Protein (g/dl)	7.6	7.2	5.4-7.7
Total WBC ($x10^9$/l)	4.8	8.0	6-17
Seg. Neutrophils (%)	79 (3.79)	80 (6.4)	60-77 (3-11.5)
Band Neutrophils (%)	04 (0.19)	02 (0.16)	0-3 (0-0.3)
Lymphocytes (%)	15 (0.72)	17 (1.36)	12-30 (1-4.8)
Monocytes (%)	02 (0.096)	01(0.08)	3-10 (0.15-1.35)
Eosinophils (%)	0	0	2-10 (0.1-1.35)

The absolute values are indicated in brackets

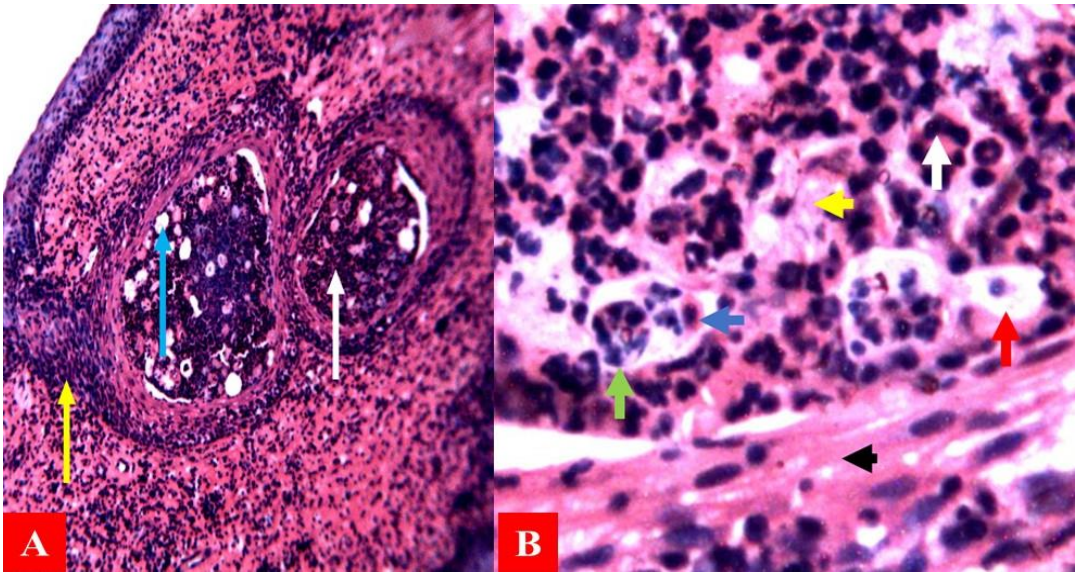

Plate II: Preputial tissue of a dog showing massive cellular infiltration (yellow arrow), vacuolation (Blue arrow) and tumour cell emboli (white arrow) H and E stain x 100 magnification (A). Numerous rounds to oval cells, vacuolation (red arrow), lymphocytes (blue arrow), giant cells (green arrow), high mitotic index (white arrow), necrosis (yellow arrow) and tumour stroma (black arrow), H and E stain x 400 magnification (B).

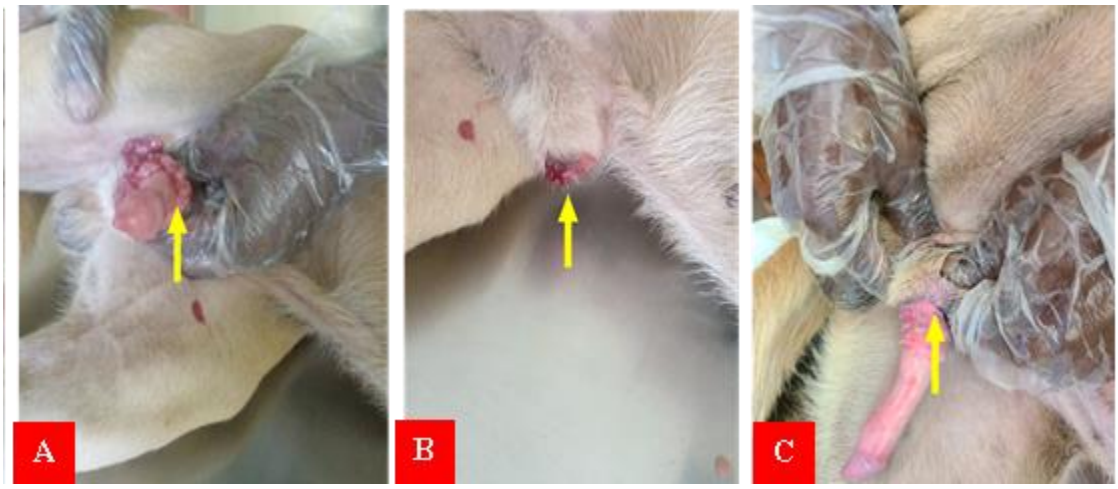

Plate III: Regressing tumor mass in week 2 (A). Tumor mass regression at week 3 of treatment (B). No signs of tumour reoccurrence or bleeding from the preputial area in week 4 (C).

at week 4 of treatment. The vital parameters show no infection in the growth, allowing healing to occur. It was concluded that histopathological analysis combined with haematological studies could be utilized for the early diagnosis and prognosis of canine transmissible venereal tumours. The administration of vincristine sulphate at a dosage of 0.025 mg/kg intravenously once per week for four consecutive weeks has proven to be effective in managing this case.

Conflict of Interest

The authors declare that there is no conflict of interest.

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