CASE REPORT

Canine Cutaneous Extragenital Venereal Granuloma (CCEVG): Clinical and Pathological Features, Diagnostic Approach, and Treatment Strategies

Naiya P. Parikh*, Mahesh T. Panchal

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Transmissible venereal tumor (TVT) is a contagious neoplasm affecting canines that is primarily transmitted through the transfer of malignant cells during coitus. TVT is a rare example of a naturally occurring allograft cancer, and studies have suggested that it may have originated from an individual dog or wolf that lived approximately 11,000 years ago (Murchison *et al*., 2014). The tumor is characterized by its predominantly extra-genital manifestations, which may develop from the implantation of neoplastic cells on exposed mucosae, as well as its unique genetic features. For instance, TVT has an unusual karyotype that is believed to have arisen from a rearrangement of the normal canine chromosomes, resulting in the maintenance of a stable tumor genome across the population of TVT cells (Bongiovanni *et al*., 2016). Young dogs, stray dogs and sexually active dogs are most regularly affected by this tumour (Nak *et al.,* 2005). It is classified into two groups, genital TVT and extragenital TVT, depending upon the sites of the tumour mass is present (Das and Das, 2000). The most common site of TVT is the caudal penile region in male dogs and the posterior vagina region in female dogs, with the tumor frequently surrounding the urethral orifice and protruding from the vulva if located within the vagina. In rare cases, TVT may develop at extra-genital sites. Macroscopically, TVT lesions are often friable, with a low cohesion between the neoplastic cells, resulting in their propensity to hemorrhage. This tendency towards bleeding, in conjunction with the formation of nodular, granulomatous, or necrotic masses, typically forms the first clinical sign observed in affected animals. Diagnosis of TVT often involves a combination of clinical presentation, cytology, histopathology, and immunohistochemistry to differentiate it from other neoplasms. While TVT can cause significant morbidity, several chemotherapeutic agents have shown to be highly effective in treating it. Hence, this report describes canine cutaneous extragenital venereal granuloma (CCEVG) in three dogs: its clinical and pathological features, diagnostic approach, and treatment strategies.

Case History and Observations

Three male non-descript dogs were presented to the Veterinary Clinics run by Shree Danev Foundation, Ahmedabad with a single cutaneous mass located at different locations along with genital growth. The history revealed a slight decrease in appetite, weight loss, and progressive cauliflower-like tumorous growth in the males, and fresh drops of blood oozing from the prepuce of the male. Upon clinical examination, lethargy, anaemia, weight loss, and fleshy hyperemic, cauliflower-like growths were observed in the bulbus glandis area of the penis of the affected males. The tumour masses were seen as cauliflower to irregular shape in the genitalia, and the growths were quite friable and bled easily on manipulation. In addition, the mass was seen extra-genitally at the skin of the prepuce, base of the tail, and in one case, a mass was observed at the inguinal region (Fig. 1). These symptoms were consistent with a type of cancer known as canine transmissible venereal tumor (CTVT), which is a contagious form of cancer that affects dogs.

Upon examination of the fine-needle aspirates (Fig. 2) from the cutaneous nodules, characteristics consistent with the TVT were observed. The cells appeared large and round with a small nucleus to cytoplasm ratio, coarse chromatin, and clear or slightly basophilic cytoplasm containing well-defined cytoplasmic vacuoles. The presence of mitotic figures in the sample indicates a high proliferation rate of the tumor cells (Fig. 3). These characteristics were typical of TVT cells.

[1]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Anand-388001, Gujarat, India.

Corresponding Author: Naiya P. Parikh Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Anand-388001, Gujarat, Indiae-mail: naiyaparikh8@gmail.com

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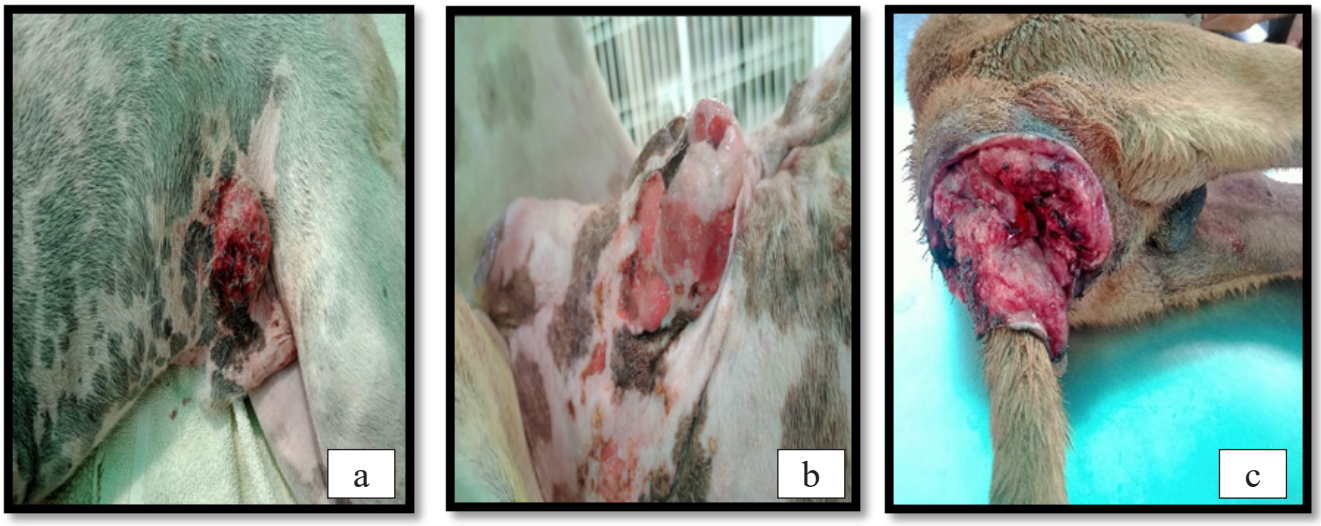

Fig. 1: Extragenital tumour: a) inguinal region, b) preputial skin, c) base of the tail

Fig. 2: Collection of tissue from tumour by FNAC

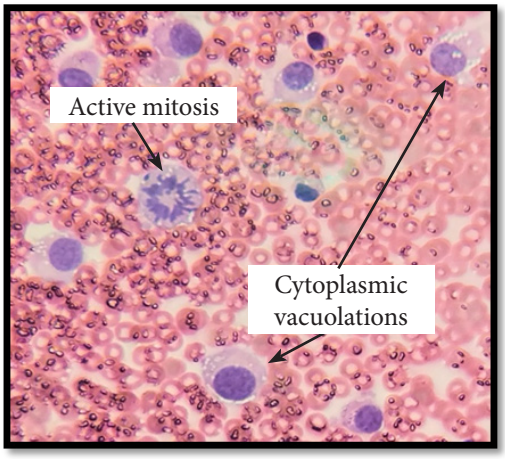

Fig 3: Confirmatory diagnosis of CTVT by FNAC

Treatment and Discussion

To treat canine transmissible venereal tumor (CTVT) in the extra-genital region, vincristine sulphate was administered at a dose of 0.025 mg/kg b. wt. intravenously in the normal saline (1 mg/mL) through the cephalic vein once a week. The treatment consisted of five sessions, and the condition was resolved with an excellent prognosis (Fig. 4).

Chemotherapy has proven to be an effective treatment option, with several chemotherapeutic agents showing high efficacy rates in treating cancer and TVT, including vincristine, vinblastine, doxorubicin, and cyclophosphamide (Cohen *et al*., 2015). Genetic characteristics, unique karyotype, and predilection for extra-genital sites make CTVT a fascinating research subject. In most cases, complete regression of the tumor can be achieved in four to five injections. One of the most successful cytostatic agents is vincristine sulphate, which has a higher success rate than other agents.

Canine transmissible venereal tumor (CTVT) is caused by the transfer of living cancer cells between dogs during mating or other forms of contact. The canine CTVT cell line, which is unique in that it is a clonal cell line derived from a single original tumor cell. The condition is most commonly observed in stray dogs and those with weakened immune systems, as they are more susceptible to the transfer of the cancer cells. Metastasis, the spread of cancer cells from the primary site to other areas of the body, is a common occurrence in many types of cancer, including CTVT (Ponce *et al*., 2019). The most common site of metastasis for CTVT is the regional lymph node, but it is important to note that distant nodes outside the expected lymphatic drainage pattern can also be involved. Skin and subcutaneous tissue have also been reported as common sites of metastasis for CTVT (Sánchez-Siles *et al*., 2015). Other potential areas of metastasis include the lips, oral mucous membranes, tonsil, eye, liver, spleen, kidney, peritoneum, lung, musculature, and the central nervous systems (Ortega *et al*., 2003). In female dogs, the tumor may spread directly to the internal genital tract, involving the cervix, uterus, and oviducts (Mori *et al*., 2002).

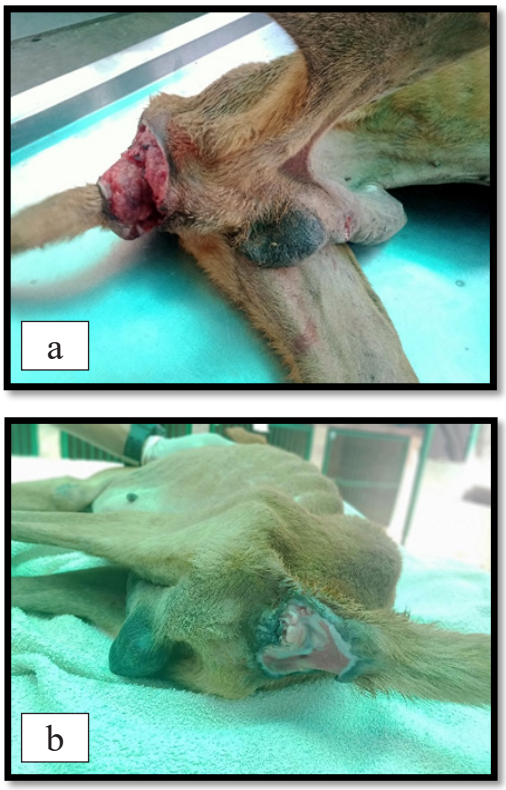

Fig. 4: a) Extragenital CTVT, b) Remission after 5 doses of vincristine sulphate

Cytological examination is a non-invasive and cost-effective method that can confirm the diagnosis of TVT. However, histopathological examination of tissue samples remains the gold standard for definitive diagnosis. Further tests, such as immunohistochemical analysis, may be required for a more accurate diagnosis and to distinguish TVT from other similar conditions. It is important for veterinarians to thoroughly evaluate and monitor CTVT patients for potential metastasis, as early detection and treatment can improve the prognosis (Ponce *et al*., 2019).

In conclusions, CTVT is a type of benign tumor that is mostly seen in the genital regions of dogs, with uncommon extragenital form. Vincristine sulphate has been found to be effective in treating CTVT, in cases of both genital and extragenital form @ 0.025 mg/kg b. wt. intravenously once a week for 5 sessions. with a good prognosis if diagnosed and treated early.

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