



CYTOLOGICAL DIAGNOSTIC OF CANINE TRANSMISSIBLE VENEREAL TUMOR - CASE REPORT

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ABSTRACT

Canine Transmissible Venereal Tumor (CTVT) is a benign reticuloendothelial (histiocytic) tumor of the dog that mainly affects the external genitalia. This tumor was found in male 2 years old mongrel dog. According to the anamnestic data, there was no visible change of its general clinical status, except spontaneous bleeding with blood drops on the prepuce and the presence of blood in the urine. With clinical examination a multilobular mass on the radix penis mucosa was found, which actually caused pseudohemorrhagia. The material for cytological diagnosis was taken with the imprint method and 4 cytological films were prepared and stained. The conclusion of the cytological diagnosis was CTVT. The tumor causes only local disturbances, and the differential diagnosis of the other "round cell tumors", histiocytomas, plasmacytomas, lymphoma, some melanomas and especially lymphosarcomas, which could be located on the external genitalia, had a big significance. Although some authors are mentioning spontaneous regression, however, because this is an invasive tumor, a complete surgical excision was made.

Key words: canine transmissible venereal tumor, dogs, cytology

INTRODUCTION

Canine Transmissible Venereal Tumor (CTVT) also known as infectious sarcoma, venereal granuloma, transmissible lymphosarcoma or Sticker tumor, is a benign reticuloendothelial (histiocytic) tumor of the dog that mainly affects the external genitalia (1). The tumor occurs naturally on the genitals of both male and female dogs. In male dogs it is located on the penis or prepuce, and in females it is present on the vagina or labia. CTVT has cauliflower-like shape, and it could be peduncular, nodular, papillary, or multilobular (2). Its surface is often with erosions, ulcers and inflamed. Also,

this tumor could be solitary or multiple, but always is located on the external genitalia. It is transmitted from animal to animal during copulation. The tumor does not often metastasize except in puppies and immunocompromised dogs. Some invasive agents (as leishmaniasis) which reduce immune response of the host could cause persistence of the lesions (3). Decrease of growth and regression is a result of the immune reaction (4), and the lymphocytes play the major role (5). Cytoplasmic inclusions found in the tumoral cells caused this tumor to be attributed to a viral agent by some authors (6), although the tumor could not consistently be transmitted by cell free extracts (7). Presently, the consensus view is that CTVT arise from allogeneic cellular transplants and that the abnormal cells of the neoplasm are the vectors of transmission (8, 9, 10). The exfoliation and transplantation of neoplastic cells during physical contact provide the main mode of transmission

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onto genital mucosa. It is believed that lack of expression of Class I and Class II MHC antigens on tumour cells is mechanism for CTVT to block host's immune system (11). All tumors examined so far have a long interspersed nuclear element (LINE-1) insertion near c-myc oncogen (12). LINEs are long DNA sequences that represent reverse-transcribed RNA molecules (also called retrotransposons), and they can be used as a diagnostic marker to confirm that a tumor is CTVT (13, 14).

MATERIAL AND METHODS

This tumor was found in male 2 years old mongrel dog, which was referred in University Veterinary Hospital - Clinic for Pet Animals and Equines at the Faculty of Veterinary Medicine, University "Ss. Cyril and Methodius" in Skopje. According the anamnestic data, there was no visible change of its general clinical status, except of prepuce sanguinose discharge and snffing and leaking in the genital area, as well as presence of blood in the urine. Urinalysis was done. The dog has normal behaviour and appetite, body temperature

was 38.0°C, pulse was 78 beats/minute, respiration 18/minute, CRT 1 sec. The consumption of wather and diuresis were normal. Ultrasound evaluation of the abdomen did not indicated any changes in the urinary tract, only spontaneous bleeding with blood drops on the praeputium was evident. With clinical examination a multilobular mass on radix penis mucosa was found, with features of prolipherative phase (p-phase); also, few hemorrhagic foci were found, which was actually cause of the hematuria (Fig. 1).

The samples of lobular tumors mass, located in the radix penis, were taken with imprint method. Cytological smears were prepared with Diff Quick staining (Merck, Darmstrad, Germany). Microscopic evaluation (Nikon; 40X) showed high cellularity and presence of tumor cells which occurred discretly. Urinalysis was done with urine strips Medi-test Combi 11 (Macherey-Nagel, Duren, Germany) and urine sediment was exeminated. However, urinalysis did not revealed any pathological process, exept high presence of erythrocytes cca. 250 Ery/ μ l and native smears of urine sediment revealed only presence of erythrocytes.



Figure 1. Radix penis. Dog. A firm, palpable multinodular mass with hemorrhagic foci is present.

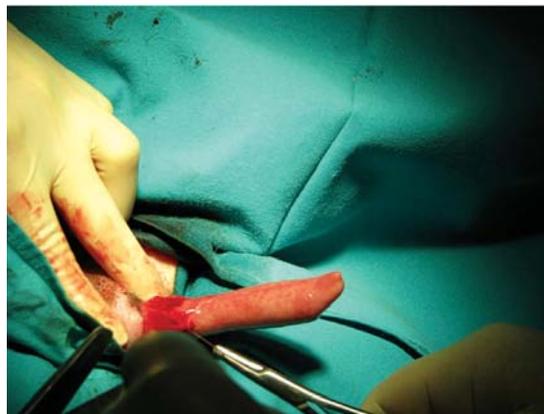


Figure 2. Radix penis of the same dog from Fig. 1 after the surgical treatment.

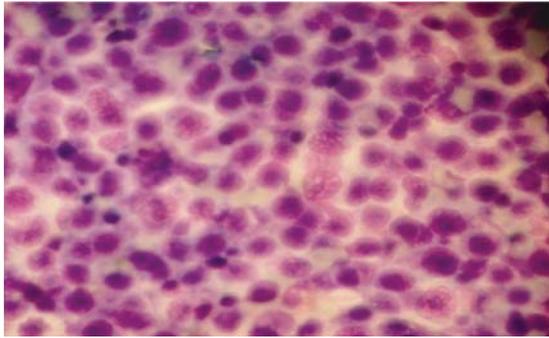


Figure 3. Radix penis musoca. Tissue imprint. Dog. Evident is high celularity and predominance of CTVT cells (Diff-Quick, 40X)

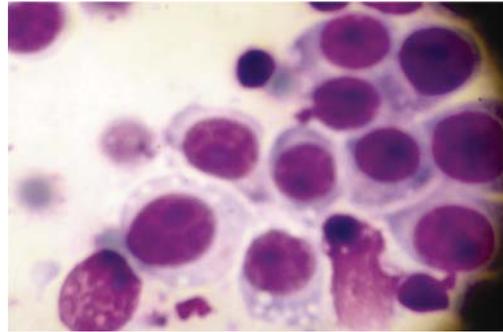


Figure 4. Radix penis musoca. Tissue imprint. Dog. Cluster of CTVT cells with coarse and reticulated chromatin, prominent nucleolus and lightly basophilic cytoplasm. (Diff-Quick, 100X)

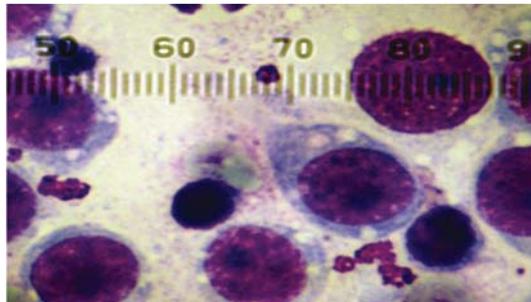


Figure 5. Radix penis musoca. Tissue imprint. Dog. CTVT cells often show high vacuolation. Also, two lymphocytes, one neutrophil and one unclassified lymphoid cell (on the top-right) are present. (Diff-Quick, 100X)

RESULTS AND DISCUSSION

CTVT has many similarities with other round cell tumors. Regular approach and exact differential diagnosis is very useful for further treatment and expecting eventual recurrence. Cytological examination is valuable for diagnosis of round cell tumors, because they do not always have clear arhitectial features. The most of the morphologic aspects of diagnostic opinion come from individual cell morphology, which is clearer with use of the imprint method. CTVT cells are large round cells with round nucleus, coarse chromatin, one to two prominent nucleoli, abundant and lightly basophilic cytoplasm and multiple punctate vacuoles (15) (Fig. 3, Fig. 4). In this case, the tumor cells showed general criteria of malignancy, like pleomorfism,

anisocytosis, anisocaryosis, nuclear criteria of malignancy, coarsely aggregated chromatin, usully arranged cord like pattern, most had a multiple and obvious large basophilic nucleoli, which is well documented by other scholars (16, 17, 18, 19, 20). Cytoplasmataic criteria of malignancy were noticed, the color was light basophilic to colourless and moderately granular, with distinct and clear vacuoles (Fig. 4). The plasma membrane was distinct even when the cell were arranged in sheets. Acoording the typisation of Flórez et al. (2012) (21) this CTVT tumor was mixed type, because it contained both lymphocytoid and plasmacytoid cells, with neither type exceeding 59% of total cells. Lymphocytoid subtype was represented with round cells with moderately granular cytoplasm containing few clear vacuoles; nuclei were

centrally located and are round with a coarse chromatin pattern and 1–2 distinct nucleoli. The plasmocytoid subtype were ovoid cells with more abundant cytoplasm, several clear vacuoles, and eccentrically located nucleus. Lymphocytes, plasma cells and macrophages were seen, with basophilia and vacuolisation, which correlates with findings that this tumor has interaction with T lymphocytes and natural killer (NK) cells (22), so-called tumor-infiltrating lymphocytes (TILs) (19). Mitotic figures were numerous, which is also described in other case reports (23). This indicated the proliferating nature of the tumor cells (24). The nuclear:cytoplasmic ratio was slightly less than 1:1, as reported by some authors (25), although there are reports where this ratio was high (18, 19).

Cytological evaluation is essential for diagnosis the tumors of genital tract in dogs. In all cases historical data and physical findings have a main role in final diagnosis. Cytological features of the genital tumors in this case have typical criteria of transmissible venereal tumor. So, the other round cell tumors, such as histiocytoma, mastocytoma, lymphoma, plasmacytoma, melanoma were excluded. Canine histiocytoma shows three cell types: the first are oval or polygonal histiocytic cells with slightly acidophilic and occasionally vacuolated cytoplasm; second type are plump spindle shaped fibroblast-like cells; and the third type are multinucleated giant cells containing 2 to 35 nuclei and abundant cytoplasm (26, 27, 28). The mastocytoma tumor cells are medium in size, oval and polygonal in shape, with centrally located nucleus, and the cytoplasm is pale stained with eosin (29, 30, 31). B-cell lymphomas are consisted of large round cells, with nuclear polymorphism and variable amount of eosinophilic cytoplasm (32). On other side, the lymphoid infiltrate in T-cell lymphomas is usually monomorphic but can vary from one case to another, but most often these cells are medium sized, with a hyperchromatic nucleus and an irregular contour (convoluted appearance - digit form) (33). Neoplastic plasma cells resemble very much with CTVT cells, i.e. they are round to oval cells with predominantly round nuclei, coarsely clumped chromatin, variable amounts of pale basophilic cytoplasm, but they manifest low to moderate mitotic activity (34, 35). Melanoma cells have pleomorphic round pale nuclei with marginated chromatin and prominent nucleoli, mitotic figures

are rare and the cytoplasm is lightly eosinophilic (36). Their shape varies from polygonal to spindle (37).

Treatment of CTVT involves chemotherapy, radiotherapy, and surgical excision. In this case the tumor was firm palpable mass in the radix penis area and the patient was in good general condition, surgical removal was strongly recommended, so the castration was done (Fig. 2).

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