CANINE TRANSMISSIBLE VENEREAL TUMOUR IN FOUR YEAR OLD BULL MASTIFF DOG: A CASE REPORT

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ABSTRACT

A four year old bull mastiff dog weighing 30 kg was presented to the Khola Veterinary Clinic, Umuahia, Abia State, Nigeria with complaint of protruding mass on the penis. Anamnestic information revealed that the dog has mated two bitches and was later traced that one of the bitches was treated for transmissible venereal tumour (TVT) five months ago before mating. However, the bitch developed the lesion again two months after whelping and was again treated with Vincristine. The Bull mastiff dog was observed to develop a protruding mass on the penis 10 months after mating with the bitch with history of TVT. The dog was treated with vincristine which led to the disappearance of the mass but however the mass re-occur two months after every treatment re-occurring in more severe form. On clinical examination the dog has normal behavior, appetite and vital parameters. A pedunculated a multilobular mass was seen on the shaft and caudal area of the penile mucosa. The material for cytological diagnosis was taken with the imprint method of the mass and cytological films were prepared and stained with Haematoxylin and Eosin and then view under x40 and oil immersion. The result showed high cellularity and presence of tumor cells which occurred discretely and confirmed CTVT. The case was managed by surgical excision and treatment with Vincristine at 0.05 mg/kg weekly for 4 weeks.

Keywords: Canine transmissible venereal tumor, Bull mastiff dog, Cytology, Surgery

INTRODUCTION

Canine transmissible venereal tumour (CTVT), Sticker's tumours (Do Amaral *et al.,* 2007) is a naturally occurring, coitally transmitted neoplasm of dogs, which affects the external genitalia. Transmissible venereal tumour (TVT) is commonly seen in young, free-roaming and sexually active dogs (Hantrakul *et al.,* 2014). Although this tumor is reported worldwide, it is more common in tropical and subtropical urban areas (Hantrakul *et al.,* 2014). CTVT is morphologically classified as a spherical (round) cell tumour, however, although the exact origin of the cells is unknown, immunohistochemical studies reveled histiocytic and mesenchymal origin (Do Amaral *et al.,* 2007). They are usually benign but there is a risk of relapse and

metastasis (Martins *et al.,* 2005; 2010). Metastasis of TVT to the skin, regional lymph nodes, tonsils, eyes, brain, pituitary, nose, tongue, lips, mammary gland thoracic and abdominal viscera has been reported (Feldman and Nelson, 1987; Das and Das, 2000; Nak *et al.,* 2004).

In dog, TVT is usually found on the caudal penile region, from the crura to the bulbus glandis or the area of the glans penis and occasionally on the prepuce. In the bitch, the neoplasm is commonly located on the posterior vagina region, at the junction of the vestibule and the vagina. It sometimes surrounds the urethral orifice, and if it is just within the vagina, it may protrude from the vulva (Do Amaral *et al.,* 2007). TVT may also develop at extra-genital sites, even when there are no genital lesions, such as the skin, nasal cavity or the mouth and ovary (Costa, 1999).

CTVT is transmitted during copulation by the implantation of tumour cells by direct contact with genital mucosa or cutaneous lesions at the time of breeding or in nasal and oral cavities due to the habit of sniffing and licking (Pérez *et al.,* 1994).

Macroscopically, the masses have a cauliflower appearance but can also manifest as plaques and necrotic tissue (grey) and can be friable. The animal may have serosanguineous secretion, vulvar and preputial deformities due to tissue destruction, intense smell, ulceration and itching at the affected region, altered behaviour, aggression, and in severe cases, urinary retention (Costa, 1999; Martins *et al.,* 2005).

Cytomorphologically studies have sub-classified CTVTs as lymphocyte-like, formed predominantly by round tumour with a high proportion of nucleus: cytoplasm (similar to lymphocytes); plasmocyte-like, consisting of cells with oval nuclei and a lower proportion of nucleus: cytoplasm (similar to plasma cells); or mixed forms, in which both of the two patterns are present (Do Amaral *et al.,* 2007; Gaspar *et al.,* 2009). Plasmocyte-like CTVT has higher aggressiveness and malignant potential, and it was found to be associated with the development of metastases, extragenital presentation (Do Amaral *et al.,* 2007), increased resistance to the antitumour action of propolis (Bassani-Silva *et al*., 2007), and higher immunoreactivity for P-glycoprotein, which is associated with resistance to multiple chemotherapeutic agents (Gaspar *et al.,* 2009).

Diagnosis is based on the environmental history, as well as clinical and cytological findings. Biopsy for histological examination is the most reliable method for diagnosis, but cytology is usually diagnostic. Definitive diagnosis can be made by chromosome analysis and transmission studies (Greatti *et al.,* 2004). Cytologically, CTVT cells are round or oval, 14 to 30 µm in diameter, with pale blue cytoplasm that is distinctly vacuolated, with a relatively high nuclear: cytoplasmic ratio. The cells also contain dense chromatin, visible nucleoli and numerous mitotic structures, including anisocytosis and anisokariosys (Erünal-Maral *et al.,* 2000).

The treatment of choice for CTVT is chemotherapy, weekly, with vincristine sulphate that has been shown to be effective and can be used alone or in combination with other drugs (Martins *et al.,* 2005; 2010). The involution of the lesions is gradual and the complete remission occurs after two to eight applications in approximately 90 % of treated cases (Martins *et al.,* 2005). Chemotherapy with doxorubicin every 21 days could be an alternative for the treatment of resistant CTVT (Costa, 1999).

CASE PRESENTATION

A four year old bull mastiff dog weighing 30 kg was presented to the Khola Veterinary Clinic, Umuahia, Abia State, Nigeria with complaint of protruding mass on the penis. Anamnestic information revealed that the dog has mated two bitches and was later traced that one of the bitches was treated from TVT five months ago before mating. However, the bitch developed the lesion again two months after whelping and was again treated with Vincristine at 0.05 mg/kg leading to the disappearance of the lesion.

The bull mastiff dog was observed to develop a protruding mass on the penis 10 months after mating with the bitch of history of TVT. The dog was treated with vincristine which led to the disappearance of the mass but

however the mass re-occurred after two months after every treatment re-occurring in more severe form.

On clinical examination the dog had normal behavior and appetite, body temperature (38.0°C), pulse (78 beats/minute) and respiratory rate (18/minute). A pedunculated a multilobular mass was seen on the shaft and caudal area of the penis mucosa. The cytological diagnosis was done using the imprint method of Tribe (1965). The cytological films prepared was strained with modified Haematoxylin and Eosin stain and then viewed under x40 and oil immersion using Olympus Microscope fitted with Motic Camera (BA310). Photomicrographs of sections were taken.

RESULTS AND DISCUSSION

Gross examination revealed pedunculated and multilobular mass, cauliflower like located at the shaft and caudal penis. Cytological diagnosis reveals oval/round cells of high cellularity and presence of tumor cells which occurred discretely and was consistent with CTVT. This was then managed by surgical excision of the tumour followed by chemotherapy (Vincristine) weekly for four weeks. The exact diagnosis of CTVT cannot be over emphasized as it has many similarities with other round cell tumors (Raskin and Meyer, 2010). Cytological examination proves important in the diagnosis of round cell tumors, as they do not elaborate clear architectural features. Examination of individual cell morphology is clearer with use of the imprint method. The cells of are large and rounded with round nucleus, coarse chromatin, one to two marked nucleoli, numerous and lightly basophilic cytoplasm and multiple punctate vacuoles (Figure 1).

In this case report, the tumor cells showed general criteria of malignancy, like pleomorphism. The coarsely aggregated chromatin, arranged in cord like pattern with multiple and large basophilic nucleoli are consistent with the reports of Stockmann *et al.* (2011) and Behera *et al.* (2012) who described the feature of malignant TVT in dog. Cytoplasmic criteria of malignancy were also noticed, the color of the cell was light basophilic to colourless and moderately granular, with distinct and clear vacuoles (Figures 1 and 2).

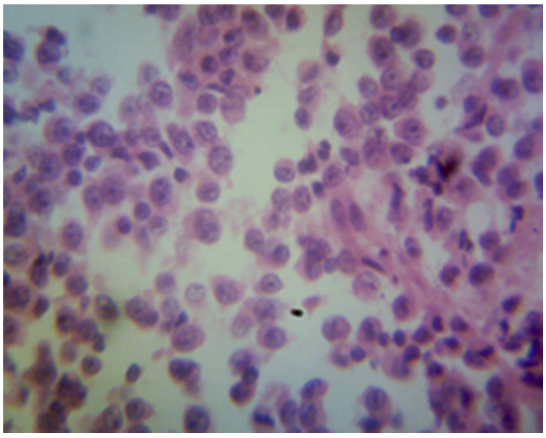

Figure 1: Photomicrograph of section of canine transmissible venereal tumour (CTVT) in bull mastiff dog showing multiple abnormally large, round, vacuolated cells (H & E, Mag. x100)

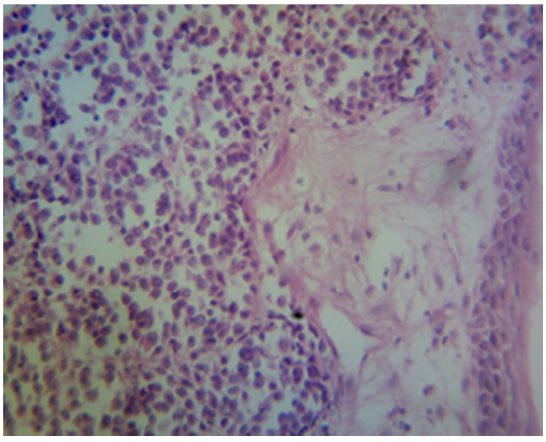

Figure 2: Photomicrograph of section of canine transmissible venereal tumour (TVT) in bull mastiff dog showing high cellularity and predominance of CTVT cells (H & E, Mag. x40)

This type of TVT observed in this study is the plasmocyte like type because of the ovoid cells types with more abundant cytoplasm, several clear vacuoles, and eccentrically located nucleus. This could account for the re-occurrence and malignancy of the infection observed in this study, this agreed with the report of Coskan *et al.* (2011) and this showed the proliferating nature of the tumor cells as reported by Thangathurai *et al.* (2008).

The nuclear: cytoplasmic ratio was slightly less than 1:1, as reported by Do Amaral *et al.* (2007), although there are reports where

this ratio was high (Stockmann *et al.,* 2011). History, clinical findings and cytological evaluation are essential for diagnosis the tumors of genital tract in dogs. Cytological features of the tumors in this case have typical criteria of transmissible venereal tumor and hence, the other round cell tumors, such as mastocytoma, lymphoma, histiocytoma, plasmacytoma and melanoma were excluded (Flórez *et al.,* 2012).

TVTs arise from allogenic cellular transplants and abnormal cells of the neoplasm are the vectors of transmission. The exfoliation of neoplastic cells during physical contact provides the main mode of transmission onto genital mucosa, and also onto nasal and oral mucosa. The implantation of the tumor is facilitated by the presence of any mucosal lesion or by the loss of integrity of mucosa (Stockmann *et al.,* 2011). Tumors grow after 15 – 60 days of implantation. In case of large and intensive tumors recurrence rate is 50 – 68 % (Martins *et al.,* 2005) which agrees with the current report but however disagree with the pre-patent period of 15 – 60 days as the tumor in this case was observed 10 months after. However this period depends upon the condition of the immune system of the animal as duration of disease increased the immune system is weekend and treatment response is very slow. According to a study, in cases of longer duration, longer periods of therapy are required and the cure rate is usually lower (Boscos and Ververidi, 2004)

Complete treatment of CTVT involves chemotherapy, radiotherapy, and surgical excision. In this present case the tumor was firm palpable mass in the caudal and shaft of the penis and surgical removal and chemotherapy was done (Figures 3, 4 and 5).

Conclusion: A combination of surgery and Vincristine injection at 0.05 mg/kg is efficient in the management of re-occurring canine transmissible venereal tumor.

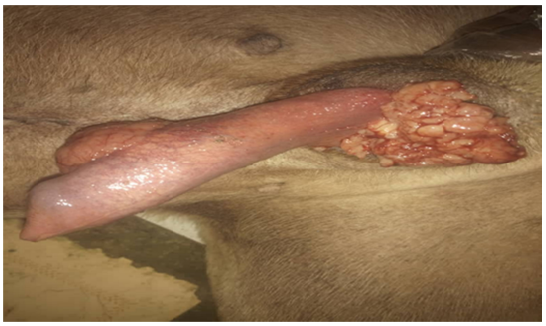

Figure 3: Photomicrograph of a large TVT mass growing on the shaft and under the bulbus glandis of a bull mastiff dog penis. Mag. x 0.5

Figure 4: Photomicrograph of the surgical excision of the TVT mass from a bull mastiff dog. Mag. x 0.5

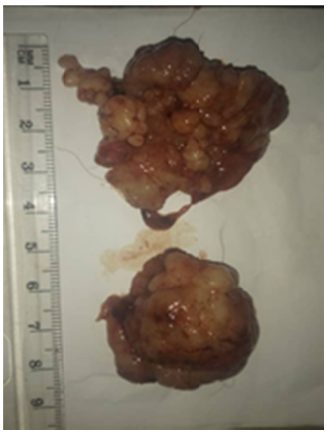

Figure 5: Photomicrograph of the excised TVT mass from a bull mastiff dog. Mag. x 0.5

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