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Case Reports

ELECTROCAUTERY RESECTION AS A TREATMENT OPTION FOR CANINE TRANSMISSIBLE VENEREAL TUMOUR (CTVT)

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SUMMARY

A 5-year-old Mongrel was brought presented with the complaint of having serosanguineous discharge from penis for a month since adoption. Physical examination revealed cauliflower-like mass at the bulbus glandis. Presence of numerous anisokaryotic and anisocytotic round to oval histiocytes with multivacuolated cytoplasm from cytology, an evidence of canine transmissibale venereal tumour (CTVT). The mass was successfully surgically resected using electrocautery and was in remission for 12 months (since January 2019).

Keyword: Canine transmissible venereal tumour, surgical resection, electrocautery

INTRODUCTION

Canine transmissible venereal tumour (CTVT) is a round cell origin, histiocytic tumour that can be horizontally transmitted among canidae family through coitus, licking, biting and sniffing the tumour presented areas (Withrow, 2013; Da Silva *et al.,* 2014). CTVT is also known as transmissible venereal granuloma, Sticker's sarcoma, and canine condyloma (Ganguly *et al*., 2016). This tumour is believed to be originated 10 000 to 15 000 years ago when the dogs were first domesticated (Rebbeck *et al.,* 2009). The distribution of the CTVT is reported from all continents except in Antarctica (Das and Das, 2000). It is mostly seen in tropical and subtropical climates and observed in all geographical conditions (Strakova and Murchison, 2014).

There is no breed, age, or sex predilection for this disease but it is frequently reported in dogs from the age of two to five years old due to active engagement in sexual activities (Das and Das, 2000). The disease is found to be reported more in female animals than in male animals. This is due to the spread of disease by a carrier male animal via copulation with many female animals (Das and Das, 2000). This tumour is believed to be strictly host specific for the dog and fox (Rust, 1949).

CTVTs are usually manifested on genital, oral, and nasal mucosa (Da Silva *et al.,* 2014). The tumour starts small and eventually grows to a substantial, ulcerated and contaminated mass which is friable, hyperemic, haemorrhagic, multilobular, cauliflower-like. It is locally aggressive but rarely metastatic which can be diagnosed based on cytology and histology (Da Silva *et al.,* 2014). Few treatment options have been discussed for CTVT including total or partial penile amputation (Papazoglou, 2002), radiotherapy and chemotherapy, cryosurgery and electrocautery (Choi *et al.,* 2014). This paper describes the successful resection of CTVT from glans penis by electrocautery, without complication, in a mongrel.

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CASE REPORT

A 5-year-old male intact rescued stray, weighing 19.6 kg was presented to UMK veterinary clinic (UMKVC, Kota Bharu, Kelantan) with the complaint of having serosanguineous discharge from the penis for one month. The dog was on doxycycline (10mg/kg per os, q24h for 28 days) for babesiosis. Its body condition score was 3 out of 5. Upon physical examination, the dog appeared bright, alert and responsive. Vital parameters were normal except pale mucous membrane. External genital was examined and the prepuce was found swollen. A cauliflower-like mass was found encircling at the base of the bulbus glandis upon retraction of the prepuce. The mass appeared friable, haemorrhagic, ulcerated and inflamed.

Differentials were transmissible venereal tumour, canine papilloma virus infection and prostatitis. A glass slide was gently pressed on the mass and the impression smear was stained with Diff-Quik. The smear revealed presence of medium to large individual round cells with round nuclei and distinct peripheral discrete margined cytoplasmic vacuoles and infiltration of lymphocytes between the cells which is conclusive of canine transmissible venereal tumour (Figure A).

Complete blood count revealed granulocytosis (9.9 x 10^3/µL; Reference range: 2.0-8.0 x 10^3/µL), and thrombocytopenia (100 x 10^3/µL; Reference range: 117-490 x 10^3/µL). Radiograph revealed that the mass was located at the base of the bulbus glandis and there was no growth beyond that region (Figure B).

The dog was premedicated with acepromazine (0.05 mg/kg, SC), induced with propofol (6 mg/kg, IV) and maintained with isoflurane 2-3%. Tramadol hydrochloride (4 mg/kg, SC) was given as perioperative analgesia. The mass at the base of the bulbus glandis was revealed by retracting the prepuce (Figure C). The surgical site was aseptically prepared and draped.

Circular incision was made adjacent to the tumour with a surgical margin of 3.0 mm. The tumour on the bulbus glandis was undermined using electrosurgical unit (Hyfrecator® 2000, CONMED™) with 28-Watt power

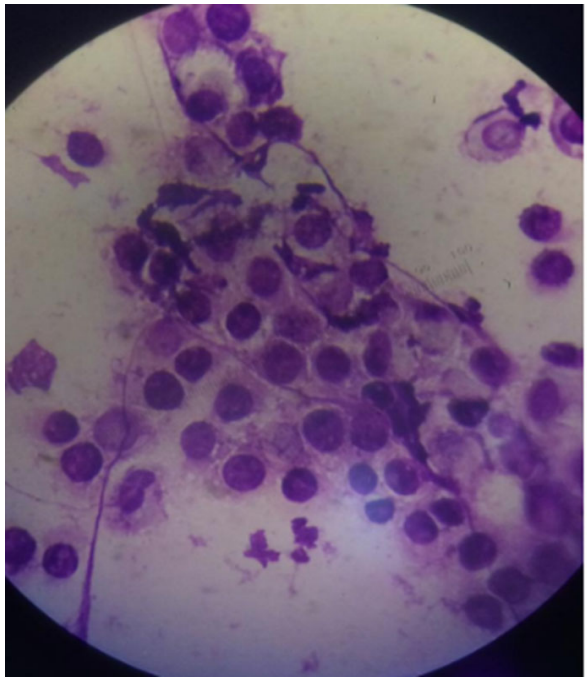

Figure A. Impression smear of friable mass from bulbus glandis with 100 times magnification shows large individual round cells (black arrow) with round nuclei and distinct peripheral discrete margined cytoplasmic vacuoles (red arrow) and infiltration of lymphocytes (yellow arrow) between the cell.

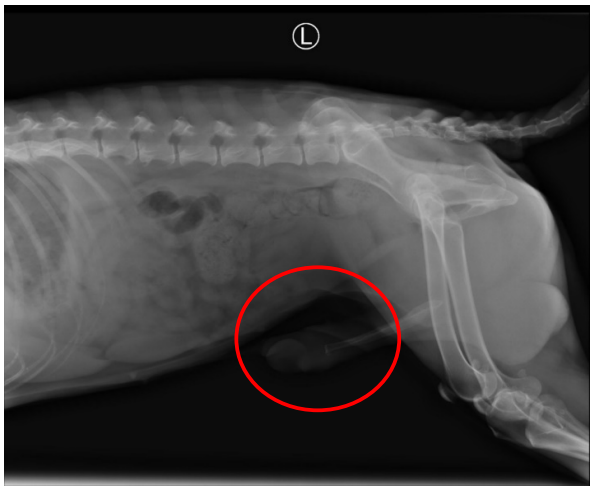

Figure B. Lateral view of radiograph revealed the mass at the base of bulbus glandis (red circle) and there was no growth beyond that region.

and monopolar setting and completely excised (Figure D). After resection, the surgical area was checked for capillary bleeding (Figure E). The area was flushed with normal saline and the mucosal defect area was sutured using a 3-0 monofilament absorbable suture material (Vicryl®, Ethicon) in a Cushing's suture pattern followed by a routine pre-scrotal castration.

The dog was given phytonadione (2.5 mg/kg, SC) once and amoxicillin (20 mg/kg, SC) once post-operatively. Oral prednisolone (1 mg/kg) was prescribed

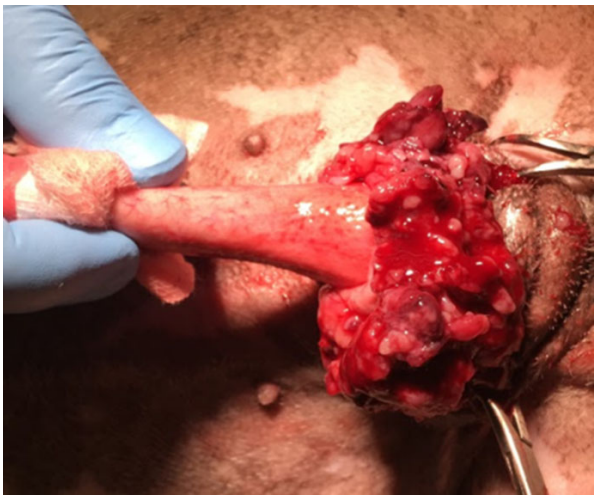

Figure C. Cauliflower like lesions was revealed at the base of the bulbus glandis.

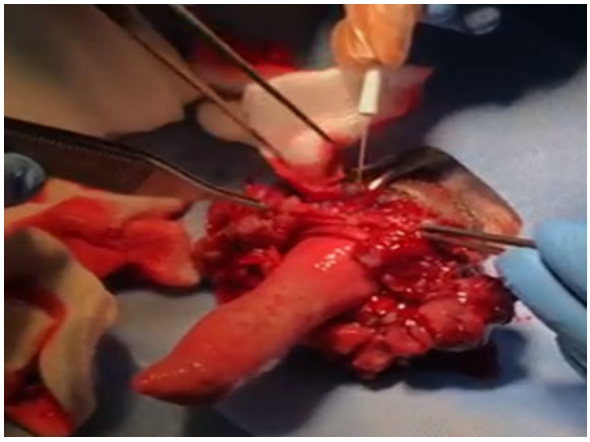

Figure D. Electrocautery resection of the TVT.

Figure E: Appearance of Bulbus glandis after tumour resection.

for a week and tapered down by 0.25 mg/kg for every subsequent week. The prognosis for the case was good and the dog recovered well after the surgery. E-collar was provided to prevent the dog from licking the surgical site and to avoid transmission of the tumour. The owner

was asked to monitor the colour of discharge, discomfort and pain. The owner was also requested to avoid releasing the dog to the street as to prevent transmission to other dogs. The dog was under remission until the follow up period of 9 months.

DISCUSSION

Treatment for CTVT comprises of surgery, radiotherapy, immunotherapy, and chemotherapy (Das and Das, 2000; Purohit, 2009; Sankar *et al.,* 2016; Cizmeci *et al.,* 2018). Chemotherapy like Vincristine sulphate is the most practical and effective option to treat CTVT; used either alone or in combination with other chemotherapy drugs and treatment modalities if the tumour does not respond to only Vincristine sulphate (Kim *et al.,* 1996; Javanbakht *et al.,* 2014; Ucar, 2016). Vincristine sulphate was not used in this case because the owner failed to comply with follow-up treatments.

Surgical resection has been practiced with low rate of efficacy (Ganguly *et al.,* 2016). It is preferred for small localised CTVT, however the post-surgical recurrence rate ranges from 50% to 68% depending on the location and extent of the disease (Purohit, 2009; Ganguly *et al*., 2016). The high post-surgical recurrence rate is also contributed by the nature of the neoplastic cells itself as they easily exfoliate and adhere to the surgical site when there is bleeding, as blood is a carrier of these cells (Boscos and Ververidis, 2004). Hence, removing CTVT using electrocautery provides better haemostasis which ultimately prevents the transmission and adhesion of the neoplastic cells to the surrounding tissues (Choi *et al.,* 2014).

Human studies have shown that electrocautery resection elicits greater pain post surgically compared to cold incision (Gloster, 2000). In contrast, there was no significant difference in the post-operative pain score between electrocautery resection and cold incision in dogs (Meakin *et al.,* 2017). Furthermore, Meakin *et al.* (2017) reported that inflammation and swelling significantly reduced upon electrocautery resection.

Choi *et al*. (2014) reported a handful of CTVT cases where electrocautery resection and cryosurgery was used, without complications and recurrence, to remove small nodules and larger nodules respectively. However, the tumour recurrence rate after resection using electrosurgery alone or in combination were not reported. On the other hand, there was a case of recurrence of peripheral nerve sheath tumour in a mongrel dog 7 months after performing cryosurgery alone, without the intervention of electrosurgery, stemming from the lack of experience of the personnel in conducting cryosurgeries and at the same time, complications such as oedema, erythema, and neuropathy had occurred (Queiroz *et al.,* 2008). Papazoglou *et al*. (2001) reported complications such as thermal burn in dogs that underwent electrocauterisation which was caused by inappropriate grounding of the electrosurgical unit. Hence, after evaluating the pros and cons of both techniques, electrosurgery was opted in this case because the surgeon was well trained in performing electrosurgeries and the electrosurgical unit was well set up to prevent thermal injuries.

Phytonadione was used for haemostasis as phytonadione is one of the catalysts to convert prothrombin to thrombin in the coagulation pathway and it is useful in semi-urgent conditions (Shield *et al.,* 2001). The administration of phytonadione despite electrocauterisation acts as a prophylactic treatment because the dog was having mild thrombocytopenia and there was capillary bleeding due to tumour angiogenesis caused by cold scalpel incision. Animals having thrombocytopenia can benefit from phynatodione administration. Prothrombin is readily produced in the functioning liver and released into the blood circulation. Phynatodione acts as a catalyst in the conversion of prothrombin to thrombin in the circulation, which increases the rate of fibrin formation in the area of endothelial injury. Moreover, the pharmacokinetics of phynatodione is independent to the concentration of platelets in the blood circulation (Eagle, 1935; McClaughry and Seegers, 1950; Shield et al., 2001; Park et al., 2010). The thrombin-catalysed conversion of fibrinogen to fibrin will eventually polymerise to form a fibrin clot (Scherega, 2004; Kaur and Jain, 2019).

Tramadol was used as peri-operative analgesia as it has been demonstrated to have anaesthetic-sparing and pain-modifying effects which allows for smooth recovery post-surgery (Epstein et al., 2015). Prednisolone was given as an anti-inflammatory for secondary peri-tumoural inflammation. It has also been known to exhibit mild anti-cancer effects through immunomodulatory mechanisms in histiocytic tumours such as in cases of CTVT (Bailey, 2008; Moore, 2014).

Signs of recurrence of CTVT such as serosanguineous discharge from the penis, deformation of the external genitalia, and presence of peculiar odour were requested to be monitored (Ganguly *et al.,* 2016; Cizmeci *et al.,* 2018). CTVT is a transplantable tumour which can be transmitted from one dog to another through mating. An infected male dog will have an increased penile size which will prolong the mating time and cause mucosal damage to the genital tract of the female. This allows for the transplantation of the tumour cells into the female genitalia (Ucar, 2016). Hence, castration will prevent mounting, which is a highly dimorphic sexual behaviour that will consequently prevent transmission of the disease (Neilson *et al.,* 1997; Purohit, 2009).

CONCLUSION

CTVT is a sexually transmitted tumour that commonly affects the external genitalia of dogs. This tumour can be successfully managed using electrocautery excision method without complications.

CONFLICT OF INTEREST

The authors report no conflicts of interest.

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