

Case Report

Sertoli cell tumor in a cryptorchid dog

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ABSTRACT

Objective: This case report describes the surgical management of a clinical case of sertoli cell tumor in a Lhasa Apso breed of dog

Materials and methods: A 4-year old sexually intact Lhasa apso was presented with complaints of alopecia, shivering, reduced appetite and swelling of the inguinal region. The dog was subjected to thorough physical, Hematological, Histopathological and Radiographic evaluations.

Results: The vital parameters were within normal values. Hematological analysis revealed anemia and thrombocytopenia as the common findings. Abdominal radiography showed a soft tissue mass in the inguinal region. Histopathology revealed testicular hypoplasia with poorly developed seminiferous tubule with no discernible lumen or spermatozoa and several proliferating sertoli cells on the lining of the basement membrane of the seminiferous tubules which is diagnostic of sertoli cell tumor. Decision to surgically excise the tumor was arrived at. The anesthetic protocol involved premedication with atropine sulphate dosed at 0.04 mg/kg bwt and xylazine dosed at 2 mg/kg bwt intramuscularly (IM). Anesthesia was induced and maintained with propofol dosed at 6 mg/kg bwt intravenously (IV). The tumor mass was surgically excised. Broad spectrum antibiotics (penstrep) and analgesic (pentazocine) were administered for 5 days IM.

Conclusion: The condition of the dog improved remarkably and it was discharged on postoperative day 10.

KEYWORDS

Cryptorchidism; Premedication; Sertoli cell tumor

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INTRODUCTION

Dogs and cats are over-represented in cases of tumours than other animal species as their lifespan normally get to the cancer age and due to the fact that they share housing, environment and diet with man ([Gamlem et al., 2008](#)). Sertoli cell tumor is one of the three main types of tumors of the testes. Others being seminomas and Leydig cell tumors ([D'Angelo et al., 2012](#); [Bini et al., 2015](#)).

In male dogs, testicular tumors (TT) are the most common neoplasms ([Nødtvedt et al., 2011](#)). Among all canine genital tumors, TT constituted >90% cases, and dogs are found to be mostly affected animals among canines ([North et al., 2009](#)). The TT are sometimes classified as mixed tumors because of their occurrence in the same testis as two different forms ([MacLachlan and Kennedy, 2002](#)). Primary TTs are histologically classified into sex cord-stromal (gonadostromal) tumors, mixed germ cell-sex cord stromal tumors and germ cell tumors ([D'Angelo et al., 2012](#)). Sertoli cell tumors (SCT) and Leydig cell tumors (LCT) are sex cord-stromal tumors and seminomas (SEM) are germ cell tumors ([Nødtvedt et al., 2011](#); [Yumusak et al., 2014](#)). Cryptorchidism is an important risk factor for the development of TT, with the risk for the development of Sertoli cell tumors been higher than that for seminomas ([Sivasudharsan et al., 2017](#)).

The SCTs are slow growing, non-invasive with low malignancy. However, the likelihood of becoming malignant increases when the tumor occurs in testes retained within the abdominal cavity ([Hohsteter et al., 2014](#)). The potential for metastasis is low as only 10% of cases show metastasis ([Švara et al., 2014](#)). A recent study revealed that the invasion of neoplastic cells in lymphatic vessels and blood is found in 40.8% of all SCT ([Švara et al., 2014](#)).

There is little information on incidence, type, location, age, and behavior of tumors in canine populations in general ([Boerkamp et al., 2014](#)). This paper reports a case of SCT and its management in a Lhasa Apso breed of dog.

MATERIALS AND METHODS

Ethical statement: General patient management and surgical procedure were carried out in line with the animal ethics guidelines of the Federal University of Agriculture, Makurdi.

Case history: A 4-year old intact male cryptorchid Lhasa apso weighing 6 Kg was presented for evaluation and treatment because of alopecia, shivering, reduced appetite and presence of a mass in the inguinal region. The vital parameters (pulse and respiratory rates) were within the normal ranges while the temperature was 39.3°C which suggested slight fever. The attending clinician suspected endocrine disorder. Acetaminophen 5 mg/kg bwt and chlorphenamine (piriton®) 4 mg/kg bwt were administered intramuscularly for 3 and 5 days respectively for the increase in temperature and pruritis. The case was then referred to the surgery unit for further evaluation. On physical examination, temperature was 38.8°C, an enlarged solid mass on the right inguinal region and the preputial sheath was also enlarged. Hematological analysis revealed anemia and thrombocytopenia (hematocrit: 27.9%, hemoglobin: 8.4 g/dL, RBC: $4.30 \times 10^{12}/l$, MCV: 65.1 fl, MCH: 19.5 pg, MCHC: 30.1 g/dL, RDW: 15.4%, Thrombocytes: $53 \times 10^9/l$, WBC: $6.6 \times 10^9/l$, Neutrophils (mature): $4.9 \times 10^9/l$, Lymphocytes $1.3 \times 10^9/l$, Monocytes: $0.3 \times 10^9/l$, Eosinophils: $0.1 \times 10^9/l$, Basophils: 0). X-ray of the caudal abdomen was taken with the tumor appearing as an enlarged soft tissue mass (**Figure 1**). Fine needle aspiration was done for histopathology (**Figure 2**). Based on history, physical examination, hematology and histopathology findings, sertoli cell tumor was diagnosed. Surgery for excision of the tumor mass was recommended to which the client consented and presented the dog on the scheduled date.

Surgical procedure: The inguinal region was shaved and aseptically prepared for surgery. The animal was premedicated with atropine sulphate (Jiangsu Huayang pharmaceutical, China) 0.04 mg/kg bwt and xylazine (XYL-M2®, VMD, Belgium) 2 mg/kg bwt IM. Anesthesia was induced and maintained with propofol (Fresenius Kabi AB, SE-751 74, Uppsala, Sweden) 6 mg/kg bwt intravenously. Incision was made directly on the skin over the tumor mass at the inguinal area. After skin and subcutaneous tissue incisions, blunt dissection was used to expose and free the tumor testicle from underlying tissues. The vaginal tunic was incised over the testis. Traction was applied to free the vaginal tunic from its attachment at the epididymis. The ductus deferens, the spermatic cord and its structures were exposed. The testicular artery supplying the affected testis was enlarged. Three hemostatic forceps were used to clamp the ductus deferens and the testicular artery. They were double ligated with surgical gut (Anhu Kangning Industrial Group, Co. Ltd., China) size 2-0. The tumor testis was then excised and removed. Following orchidectomy, the tumor testicle weighed 154 gm and measured 10 cm in



Figure 1: Abdominal Radiograph showing the enlarged testicle (arrow)

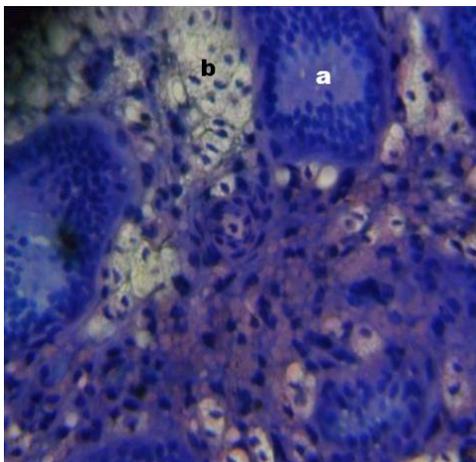


Figure 2: Photomicrograph of the affected testis. There is testicular hypoplasia with poorly developed seminiferous tubules showing no discernible lumen or spermatozoa (a). Several proliferating Sertoli cells are seen on the lining of the basement membrane of the seminiferous tubules and outside the seminiferous tubule (b)

length. It was then fixed in 10% formalin for histopathology examination. The same procedure was repeated and the contralateral normal testicle was also orchidectomized. Folds of sterile gauze materials were placed in the cavity where the mass was removed. The incision site was closed in two layers. The subcutaneous layer was closed with chromic surgical gut (Anhu Kangning Industrial group, co. Ltd, China) size 2-0 and the skin was with nylon (Anhu Kangning Industrial group, co. Ltd, China) size 2-0 leaving stitch space for removal of the gauze. The gauze was meant to stimulate massive connective tissue reaction to fill the dead space which was later removed on the third day. The dog was placed on penstrep 1 mL and pentazocine (Bharat Parenterals ltd., India) at 3 mg/kg bwt intramuscularly for 5 days during the hospitalization period. Sutures were removed on the 10th post-operative day.

RESULTS AND DISCUSSION

The incidence of TT is on the rise in humans and similar trend has been reported in dogs (Bray et al., 2006; Townsend et al., 2010). The etiology of TT is not clear but the risk factors include increasing age, breed environmental elements, and cryptorchidism (Quartuccio et al., 2012). In cryptorchid dogs, tumors more frequently develop in the right testicle; probably due to the fact that the right testicle is more likely to be retained (Liao et al., 2009). Sertoli cell tumors, interstitial cell tumors, and seminomas are the three common TT in dogs and are mostly diagnosed in geriatric dogs with average age of ten (10) years (Liao et al., 2009; Crivellenti et al., 2013).

Association between cryptorchidism and the development of Sertoli cell tumors and seminomas but not interstitial cell tumors has been reported (Liao et al., 2009; Masand et al., 2013). Dogs with inguinal cryptorchidism have higher risk of TT development than the ones with abdominal cryptorchidism (Liao et al., 2009). In one study, out of the eight cryptorchid dogs used seven had their testes retained in the inguinal region and one in the abdomen. The seven dogs with inguinal cryptorchidism suffered from more than one tumor type with Sertoli cell tumor being the dominant type while the only dog with abdominal cryptorchidism had germinal cell tumor as the dominant tumor type (Patnaik and Mostofi, 1993).

In this case, considering the age of the dog, cryptorchidism is the risk factor responsible for the occurrence of this tumor. Fever, anemia, thrombocytopenia, alopecia, feminization and pendulous prepuce observed in this case are some of the paraneoplastic syndromes associated with Sertoli cell tumors in dogs due to excessive production of estrogen. Sertoli cell tumors are known to produce pancytopenia in dogs' which is a condition in which the red blood cells, white blood cells and platelets values are below normal due to damage to the bone marrow (Villiers and Blackwood, 2005; Lawrence and Saba, 2013) and in most cases can lead to fatal outcome. The anemia in this case is normocytic hypochromic. The red blood cell and platelet values were below normal while the white blood cell values were within reference range. This is probably due to the fact that the descended testicle had normal histological appearance and had no additive effect of increased estrogen in the blood circulation. Probably, bone marrow suppressive effect that normally accompanies Sertoli cell tumor infection in dogs was not severe enough to cause pancytopenia or aplastic anemia. It could be that the

bone marrow was gradually recovering from the initial injury or the disease had not progressed to the chronic stage where all these abnormalities could have been observed (Villiers and Blackwood, 2005). Other workers (Castro et al., 2016) also reported normocytic hypochromic anemia in dogs with sertoli cell tumor.

Bilateral orchiectomy is the treatment of choice for sertoli cell tumors. This is because about 50% of dogs diagnosed of this condition have bilateral tumors but only 12% are clinically detectable in the contralateral testicle (Prasad et al., 2012; Lawrence and Saba, 2013). This might be responsible for the improvement in the condition of the dog following orchiectomy in this study. Histopathology is not only important in establishing a diagnosis of TT; it also gives the clinician the advantage of knowing the course of the disease and choosing the right method of treatment (Ciaputal et al., 2012). Conventional chemotherapy with anti-cancer agents cannot be used in tumors that develop from cryptorchid testicles because the primary reason for the tumor development is the location of the testicle in the abdominal cavity. Testicular tissue development requires lower temperature as compared to abdominal temperature. Chemotherapy may succeed in reducing the multiplication of the tumor cells but will not remove the cause.

Dogs and cats with anemia could benefit from blood transfusion; however, we were constraint as there was no donor dog. Therefore crystalloid (lactated ringers solution) was administered to the dog. The patient's condition improved tremendously following surgery as the dog became active and the appetite returned to normal. However, four weeks after the dog was discharged, it died at home. The client declined to submit the dog for post-mortem examination.

CONCLUSION

Clinicians should educate owners of cryptorchid dogs of the importance of early orchiectomy to remove the retained testicle to prevent the occurrence of TT in future which could jeopardize the health of the dogs.

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Nothing to disclose.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHORS' CONTRIBUTION

SSA, AIK, WN and BAG performed the surgery. JSR prepared and interpreted the histopathology slides. TT and TTA wrote the manuscript. VMA revised the manuscript.

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