Unilateral diffuse spermatocytic seminoma in a dog

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Abstract

In this report 13 years old spitz dog diagnosed with unilateral diffuse seminoma found on left testis was evaluated clinically and histopathologically. Case was referred to veterinary polyclinic with the complaint of swelling in scrotum. Dog was operated for the tumor and on the basis of gross and microscopic examination; diffuse spermatocytic seminoma was diagnosed in this case.

Keywords: Canine, seminoma, testis, tumor

Introduction

Testicular tumors arise from germ cells and sex-cord stromal elements of the testis (McLachlan and Kennedy, 2002) and are divided into four general categories: germ cell tumors including seminoma, teratoma, embryonal carcinoma, and yolk sac carcinoma arising from the germinal epithelium of the seminiferous tubules; sex-cord stromal tumors, including Sertoli cell tumor (SCT) and Leydig (interstitial) cell tumor; mixed germ cell sex-cord stromal tumors; and primary tumors not specific to the testis (Peters et al., 2001; Rosai et al., 2004). Testicular tumors occur more frequently in the dog than in any other species, including man (McLachlan and Kennedy, 2002; Dow, 1962). The seminoma are usually solitary and unilateral and are more common in the right than in the left testicle and can coexist with sertoli cell and Leydig cell tumor (Mostofi et al., 1998). Canine testicular germ cell tumors generally develop in middle-aged to old dogs (Hayes, 1976; Grieco et al., 2010). On the basis of the low malignancy, low metastatic potential and their tendency to develop in old individuals, it has traditionally been assumed that canine seminomas represent the counterpart to human spermatocytic seminoma (Looijenga et al., 1994). Both canine and human seminomas are typically associated with leukocytic infiltration. Testicular seminoma is characterized by prominent lymphoid infiltrates that were predominantly T cells, but B cells were also identified as some follicular aggregates in tumoral parenchyma. Dog with an undescended testis have 13.6 times greater risk of testicular cancer (Hayes and Pandergrass, 1976). Prognostically, canine seminoma are associated with a low risk of metastasis (Kennedy et al., 1998).

Material and Methods

Case history: The case was a spitz, male, 13-year-old dog weighing 26 kg. Regarding its history, it was a pet dog and there was enlargement noticed in scrotum within the last six months, which progressed to the degree that caused difficulty in walking. A marked volume increase was observed in the left half of the scrotum compared to the opposite half (Fig. 1A). The enlarged testis with hard consistency was felt during palpation and there was no symptom of pain.

Removal of testis: The dog was sedated with 1 mg/kg bw intramuscular Xylazine HCl and ketamine injection (5 mg/kg bw ). Incision was given on the scrotum. The spermatic chords were accessed with a blunt dissection. Hemorrhages during operation were controlled by means of hemostatic forceps and ligatures. Testes were removed by placing hemo-static forceps approximately 1 cm below the trans-fixation ligatures and by cutting between ligatures and hemostatic forceps. The incision line on the regional skin was closed with simple sutures with silk; and the operation was completed.

Gross and Histopathology: Detailed gross examination of tumor was performed and gross lesions were recorded. Tumor pieces were collected and preserved in 10% neutral buffered formalin for histopathology. The tissue sections were dehydrated...
with ascending grades of ethanol, cleared in xylene and finally embedded in paraffin wax. Sections were prepared at 5 µm thickness and stained routinely with haematoxylin and eosin. Tissue for TUNEL (Terminal deoxynucleotidyl transferase dUTP nick end labeling) staining collected on poly-l-lysine coated slides and stained by Promega TUNEL assay kit.

**Results**

**Gross Pathology:** Macroscopically, the left testis was firm, grayish, with variable foci of necrosis and haemorrhage and was about 10 -15 times enlarged than the right one. It was 6.8x2.7x2 cm in size and weighting 70g. The multi-lobulated appearance of outer surface of testis was giving resemblance to the bovine kidney (Fig. 1B). Testis was slightly hard to cut and cut surface revealed multiple necrotic foci and hemorrhages.

**Histopathology:** Microscopically sheets of neoplastic germ cells were found within a minimal fibro-vascular stroma (Fig. 2A). Neoplastic cells were round to polyhedral in shape with distinct cell borders and mild to marked basophilic cytoplasm. Areas of neutrophilic infiltration were also evident. There was marked anisocytosis and anisokaryosis with prevalent karyomegallic cells (Fig. 2A). Nuclei were round to oval with lightly stippled chromatin and 1–4 prominent nucleoli. The mitotic figures were plenty in number. Individual neoplastic cell necrosis characterized by cytoplasmic hypereosinophilia and condensation with pyknosis and nuclear loss was commonly observed. Nuclei of some cells showed filametous or “spireme” pattern of chromatin (Fig. 2B). A large number of cells found to undergo apoptosis as shown by staining (Fig. 2D). In addition, stromal and perivascular lymphocytes were commonly seen (Fig. 2C) with rare lymphofollicular development. The magnitude of lymphocyte infiltrations was typically mild.

**Discussion**

In dogs, scrotal hernia, torsion of spermatic chord, spermatocele, hydrocele, orchitis and testis/testes tumours are the most common causes of scrotal enlargement (Hollet, 2006). In present case torsion of spermatic chord, spermatocele and hydrocele were not present. The external examination revealed that dermis was quite edematous, indicating that the enlargement in scrotum was a result of the existing tumour (Fig. 1A).

Seminomas arise from the germ cells and are subdivided on the basis of their histological appearance into intratubular and diffuse types (Maclachlan and kennedy, 2002, Maiolino et al., 2004). The tumors in the present study, was diagnosed as a diffuse type seminoma based on histopathological patterns (Fig. 2A). Seminomas are classified as benign or malignant according to pleomorphic changes, mitotic activity and metastatic characteristics (Grieco et al., 2007). In this
case, pleomorphic changes were evident along with moderate the mitotic activity. The function of tumor infiltrating lymphocytes has not exactly been demonstrated in canine seminoma. However it has reported that tumor infiltrating lymphocytes have a correlation with less malignant and metastasized characteristic in canine seminoma (Grieco et al., 2007). In the present case no finding of malignancy was reported before and examination after 4 months post operation.

**Conclusion**

Based on the clinical and histopathological findings, it can be concluded that it was case of unilateral diffuse seminoma that do not metastasize in spite of long development process and un-complicated postoperative healing was emphasized.

**References**


