

Full Length Research Paper

Granulosa cell tumor of the ovary in dog: Case report from Tehran

Tavasoli A.¹ and Solati A.^{2*}

¹Department of Pathology, Faculty of Veterinary Medicine, University of Tehran, Tehran-Iran.

²Islamic Azad University, Saveh Branch, Saveh-Iran.

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Ovarian granulosa cell tumors (GCTs) are common neoplasm in domestic animal that originates from the sex-cord stromal cells of the ovary. The aim of present paper was to report a case of ovarian granulosa cell tumor in a 6-year-old female German shepherd and to describe the histopathological pattern of this tumor. The dog with history of clinical signs such as ascites, bloody discharge from the vulva and vulvar swelling was referred to the veterinary hospital of Tehran university. Ovariohysterectomy was done and the surgically removed ovarian masses were prepared for histopathological studies. Macroscopic and microscopic studies in this case are discussed and histopathological examination confirmed ovarian granulosa cell tumor.

Key words: Granulosa cell tumor, canine, sex-cord stromal tumor, call-exner bodies.

INTRODUCTION

Canine ovarian tumors depending on their origin, are assigned into 3 groups including: germ cell tumors, sex-cord stromal tumors and epithelial cell tumours (Kennedy et al., 1998; Nielsen, 1983).

Sex-cord stromal tumors are well-known for ovarian malignancy in domestic animals. Originated from the specialized stromal of the ovary, these tumors are unilateral, smooth surfaced, and round with diameter between 20 to 30 cm. (Foster, 2006). One of the most common neoplasms in canine ovary is granulosa cell tumors (GCTs) that originate from sex cord stromal cells. This tumor has been described in the bitches as well as the other types of sex-cord stromal tumors.

GCTs may produce and increase secretion of hormones such as estradiol, progesterone and a-inhibin (Pluhar et al., 1995). As a result of its hormonal secretion, GCT often induces persistent estrus, vulvar swelling with discharge, and alopecia (Buijtels et al., 2010; Johnston et al., 2001). GCTs in bitches have various microscopic appearances, such as follicular, cystic or poly cystic, and solid. The less important and prominent pattern in some GCT is follicular than solid sheet, cords, trabecular, or nests (Maclachlan and Kennedy, 2002; Buijtels et al., 2010).

Histologically, granulosa cells in this tumor are similar to normal granulosa cells and are often arranged like normal graafian follicles. In poorly differentiated GCT, tumor cells can be arranged in sheets. In some cases, especially in mare, call-exner bodies (rosettes of granulosa cells) are present in GCT (Foster, 2006).

These bodies consist of a radial aggregate of neoplastic cells around an eosinophilic body in the central space. This feature is very useful for microscopic diagnosis of GCT (Maclachlan and Kennedy, 2002; Foster, 2006). Sometimes, GCT shows histology pattern of separated granulosa cell, accumulated irregularly by a supporting stromal of spindle cells (Maclachlan and Kennedy, 2002).

Sex cord stromal tumors are usually benign in mare and cow but GCTs are sometime malignant in the bitch (Maclachlan and Kennedy, 2002; Zanghi et al., 2007). Many ovarian tumors produce estrogen or androgen and cause various disorders in estrus cycle, such as prolonged estrus in bitches that may develop pyometra (Yamini et al., 1997). The present paper records the histopathological findings of ovarian granulosa cell tumor in a 6-year-old German shepherd from Iran.

MATERIALS AND METHODS

This dog was taken to the university of Tehran Veterinary Hospital

*Corresponding author. E-mail: drsolati@iau-saveh.ac.ir, amiralisolati@yahoo.com. Tel: 00989123579675.

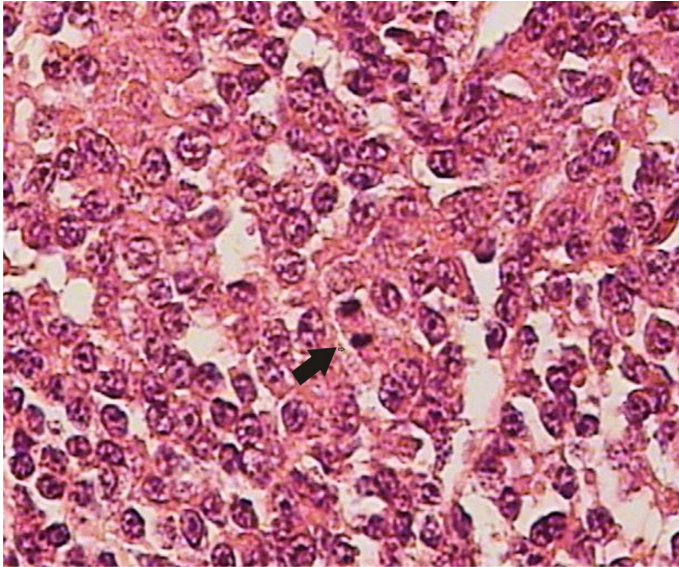


Figure 1. Photomicrograph on high power demonstrates the sheets of cell growth pattern containing mitotic figures (arrow), anaplastic granulosa cells with foamy cytoplasm and round hyper chromatic nucleus are seen (H&E, x 400).

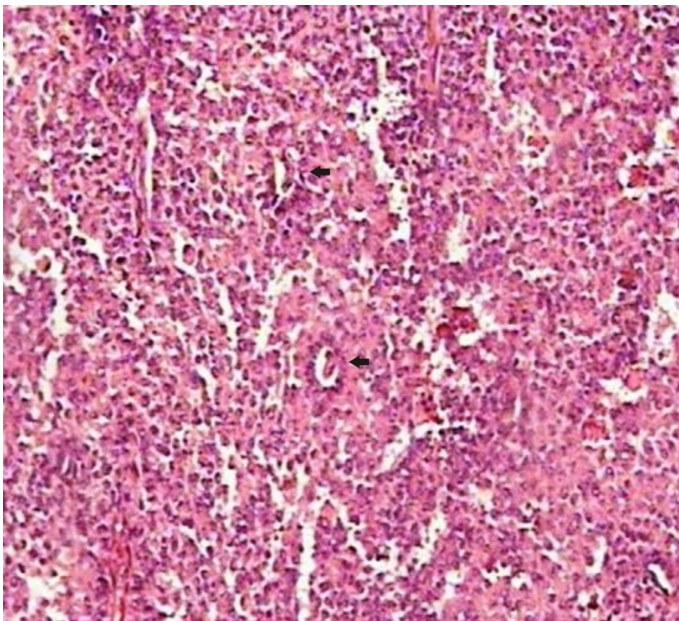


Figure 2. Medium power photomicrograph of the canine ovarian GCT shows neoplastic cells proliferated in sheeted of cell patterns with hyper chromatic nucleus and few call-Exner bodies (arrows)(H&E, x100)

and had ovariectomized. The ovarian tumor was referred to our department (pathology department). Tumor mass was fixed in 10% buffered formalin solution, dehydrated in upgraded concentrations of alcohol, cleared in xylene, imbedded and impregnated with paraffin wax, thin sections (5 to 6 μ) were cut with rotary leica microtome, and stained with routine staining, hematoxylin and eosin for microscopically studies.

RESULTS

Macroscopic and histological findings

The gross appearance of this tumor was cystic, and its surface was smooth. The consistency of tumor was soft with yellowish orange discoloration and the size of the tumor mass was 5 cm in diameter.

Histopathological examination showed neoplastic cells proliferated in a variety of patterns, including predominantly follicular patterns, minimally sertoli cell-like patterns, and diffuse sheets surrounding varying sized cystic spaces with clear fluid. Neoplastic cells being polyhedral with foamy cytoplasm and round hyper chromatic nucleus resemble normal granulosa cells in the size.

A few call-exner bodies consisting of a small central round, to oval space with eosinophilic follicular fluid surrounded by a collar of radially arranged granulosa cells were observed (Figures 1, 2 and 3).

DISCUSSION

Granulosa cell tumors make up most frequently in older dogs and are one of the most common functional tumors (secreting estradiol, progesterone as well as a-inhibin) (Pluhar et al., 1995).

Incidence of primary or secondary canine ovarian tumors reported in dogs with neoplasia diagnosed at necropsy, ranges from 0.5 to 6% (Dow, 1960; Madewell and Theilen, 1987). In fact, many cases of functional and nonfunctional GCTs in dogs have been reported by other researchers from around the world (Patnaik and Greenlee, 1987).

It has been reported that older bitches may be affected by granulosa cell tumor with the same frequency as ovarian papillary cystadenocarcinoma (McCandlish et al., 1979; Pluhar et al., 1995; Marino et al., 2003). Depending on its hormonal production, GCTs are often associated with clinical signs in dogs including: vaginal discharge; enlarged nipples; alopecia; enlarged vulva; pyometra; cystic endometrial hyperplasia; and irregular, prolonged, or persistent estrus (Zanghi et al., 2007; Johnston et al., 2001). Dogs with nonfunctional granulosa cell tumors usually have no clinical signs related to the reproductive tract. A higher percentage of canine granulosa cell tumors are malignant and metastasize to regional lymph nodes and organs, whereas, according to the microscopic pattern of this tumor, it was diagnosed as benign granulosa cell tumor.

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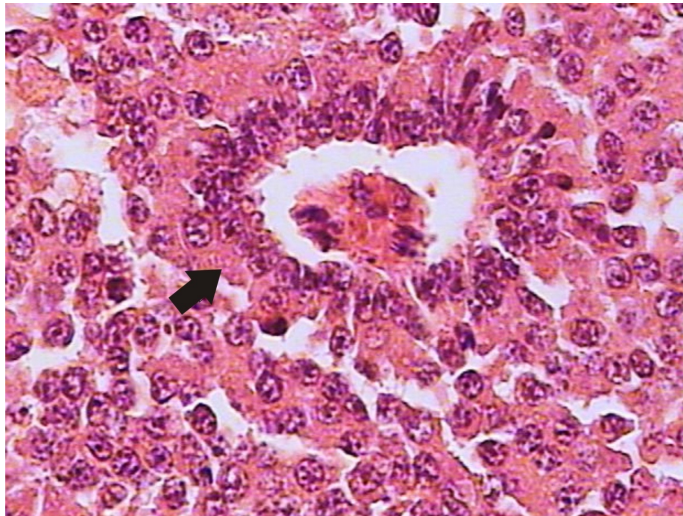


Figure 3. Photomicrograph on high power of the ovary displaying call-Exner bodies (arrow) consisting of a small central oval space with eosinophilic follicular fluid separated by sheets of granulosa cells (H&E x400).

2002).

Call-exner bodies are not always present particularly in extremely large tumors, however, their presence is diagnostic of granulosa cell tumor (Maclachlan and Kennedy, 2002; Foster, 2006).

To conclude, this paper reports functional GCT in bitch, but in spite of the GCTs reported by many researchers in dog, this is the first report from Iran, according to the authors of this study.

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