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Ovarian teratoma in a bitch

Teratoma ovariano em cadela

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ABSTRACT: Teratoma is an unusual ovarian tumor, usually benign, originated from embryonic germ cells that mainly affects bitches. Diagnosis is often accidental and occurs mostly during elective or therapeutic surgical procedures or abdominal ultrasonography. This report describes a case of benign ovarian teratoma in a bitch submitted to exploratory laparotomy for emergency enterectomy due to ingestion of a linear foreign body. The neoplasm was discovered during the surgical procedure and a salpingo-oophorectomy was performed. The tumor was referred for histopathological examination, which revealed disorganized proliferation of multiple tissues of different embryonic origins, with formation of follicular cysts, adipose, cartilaginous tissue, and nerve fibers throughout the neoplasia. There were no criteria for malignancy in neoplastic cells and the final diagnosis was benign ovarian teratoma. The animal died from post-surgical complications related to intestinal necrosis. As with most cases reported in the literature, teratoma was a finding during a surgical procedure and was not causing clinical changes in the patient.

KEYWORDS: germ cell tumors; ovarian neoplasms; follicular cyst.

RESUMO: O teratoma é um tumor ovariano incomum, normalmente benigno, originado de células germinativas embrionárias que acomete principalmente cadelas. O diagnóstico muitas vezes é acidental, ocorrendo durante a realização de procedimentos cirúrgicos eletivos ou terapêuticos ou em exames ultrassonográficos abdominais. O presente relato descreve um caso de teratoma ovariano benigno, em uma cadela submetida a laparotomia exploratória para realização de enterectomia de emergência devido a ingestão de corpo estranho linear. A neoplasia foi descoberta durante o procedimento cirúrgico e optou-se pela realização de ovariossalpingohisterectomia. O tumor foi encaminhado para exame histopatológico, o qual revelou proliferação desorganizada de múltiplos tecidos de origens embrionárias diferentes, com formação de cistos foliculares, tecido adiposo, cartilaginoso e fibras nervosas ao longo da neoplasia. Não havia critérios de malignidade nas células neoplásicas e o diagnóstico final foi de teratoma ovariano benigno. O animal acabou vindo a óbito por complicações pós-cirúrgicas relacionadas à necrose intestinal. Assim como boa parte dos casos relatados na literatura, o teratoma foi um achado durante a realização de um procedimento cirúrgico e não estava causando alterações clínicas no animal, sendo, portanto, uma neoplasia que normalmente não causa manifestações clínicas na maioria dos animais acometidos.

PALAVRAS-CHAVE: tumores germinativos; neoplasia ovariana; cisto folicular.

INTRODUCTION

A teratoma is a type of ovarian tumor originating from embryonic germ cells and composed of two or more germ layers (Agnew; Maclachlan, 2017). In its composition, several disorganized tissues are observed, differentiated or not, including hair, nervous tissue – originating from the ectoderm; tooth, muscle – originating from the mesoderm; intestinal or respiratory epithelium – originating from the endoderm (Sirivisoot *et al.*, 2022). This ovarian neoplasm affects bitches with an average age of 6.5 years (Patnaik; Greenle, 1987).

Considered uncommon, teratoma is rarely reported and is present in its benign form in the majority of cases. Diagnosis is often accidental, occurring during elective or therapeutic surgical procedures mainly due to the fact that many bitches have mild symptoms (Oviedo-Peñata *et al.*, 2020). Ultrasound (Troisi *et al.*, 2023) and radiographic examination can give more information about the presence of ovarian neoplasia, but only histopathological examination provides the final diagnosis of teratoma (Diez-Bru *et al.*, 1998).

The treatment of ovarian teratoma is surgical and consists of a procedure called salpingo-oophorectomy to remove the reproductive structures and the neoplasm (Arlt; Haimerl, 2016). The aim of this study is to report a case of ovarian teratoma in a female dog.

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CASE REPORT

A 9-year-old female dog, with no defined breed and not neutered, was admitted to a private veterinary clinic with marked apathy and signs of acute abdominal pain. An abdominal ultrasound scan revealed a linear intestinal foreign body. The patient was referred for an enterectomy to remove the foreign body. The intestinal loops were markedly reddened and friable, with multifocal areas of necrosis.

During the surgical procedure, a mass was observed in the region of the left ovary. The surgeon in charge decided to perform a salpingo-oophorectomy (OSH) and sent the surgical specimen (uterus and right and left ovaries) together with the mass for histopathological assessment.

In the macroscopic evaluation, the uterus and right ovary showed no alterations. While the left ovary showed an irregular, lobulated mass, with firm areas and soft areas, surrounded by a thick capsule, whiteish in color with gray and red areas, measuring 6.7 x 5.8 x 3.9 cm. When cut, the mass was cystic in appearance and had cream-colored pasty contents, with a large amount of hair, along with multifocal whitish, firm to hard areas.

On macroscopic assessment, the uterus and right ovary showed no alterations. While the left ovary showed an irregular, lobulated mass, with firm areas and soft areas, surrounded by a thick, whitish capsule with grayish and reddish areas, measuring 6.7 x 5.8 x 3.9 cm. When cut, the mass had a cystic appearance and cream-colored pasty content, with a large amount of hair, together with multifocal whitish, firm to hard areas (Figure 1).

On microscopy, the uterus and right ovary also showed no alterations. Histology of the left ovary revealed that the mass contained a proliferation of tissues from different embryonic origins which formed differentiated but disorganized adult tissues, with areas containing disorganized nerve fibres; areas of mature adipose tissue - from which multifocal areas containing hyaline cartilage appear; areas of connective tissue proper not shaped like dermis and with disorganized areas. The formation of large cystic structures full of keratin sheets and hair shafts was also visualized, the wall of which is lined by basal and squamous epithelium with a morphology compatible with a follicular cyst. There were also multifocal areas of necrosis and a mild lymphocytic inflammatory infiltrate (Figure 2).

The histopathological findings of the mass in the left ovary were compatible with a teratoma, since no cells with malignant characteristics were observed in the tumor tissue. After surgery, the patient died due to intestinal rupture as a result of obstruction caused by excessive ingestion of grass.

Figure 1. Left ovary showing an irregular, lobulated mass, covered by a thick, reddish capsule which, when cut, shows multiple coalescing cystic areas filled with cream-colored pasty contents with a large amount of hair. In the center there is a whitish, hard focal area.

DISCUSSION

Ovarian teratoma is a benign tumor considered uncommon in veterinary medicine (Agnew; Maclachlan, 2017), while in women it accounts for around 20% of ovarian tumors (Saida *et al.*, 2021). Most of the time, diagnosis is accidental, as in the case described here. Affected bitches may show non-specific clinical signs or be asymptomatic, so abdominal ultrasound is the test that helps to guide the diagnosis by visualizing masses in the ovary (Troisi *et al.*, 2023). However, the patient's clinical condition made it impossible to identify the neoplasm during the ultrasound scan, as a linear intestinal foreign body was quickly identified, so the patient was referred for emergency surgery. Oviedo-Peñata *et al.* (2020) mention that the diagnosis of ovarian teratoma commonly occurs during elective or therapeutic surgical procedures, as in this case, in which a therapeutic enterectomy procedure was performed and, in the trans-surgical act, the mass was identified followed by its removal through salpingo-oophorectomy. This technique is recommended as a treatment for ovarian teratoma because, in addition to providing the necessary sample for histopathological analysis, it confers a definitive diagnosis and is considered the gold standard for ovarian neoplasms (Oviedo-Peñata *et al.*, 2020).

On microscopy, the diagnosis of teratoma was confirmed by the visualization of tissues of different origins with at least two embryonic germ layers: ectoderm and mesoderm. The areas of nerve fibers originate from the ectoderm, as do the follicular cysts and follicle-sebaceous structures, while the multifocal areas containing hyaline cartilage and adipose tissue come from the mesoderm (Moore; Persaud; Torchia, 2022). Garcia *et al.* (2021) also identified epithelial, nervous and cartilaginous tissues in ovarian teratomas under microscopy, as in the present case. Gülcubuk *et al.* (2012) reported an ovarian teratoma in a female dog composed of neural tissue with neurons and Glia cells, epidermis and dermal appendages (hair

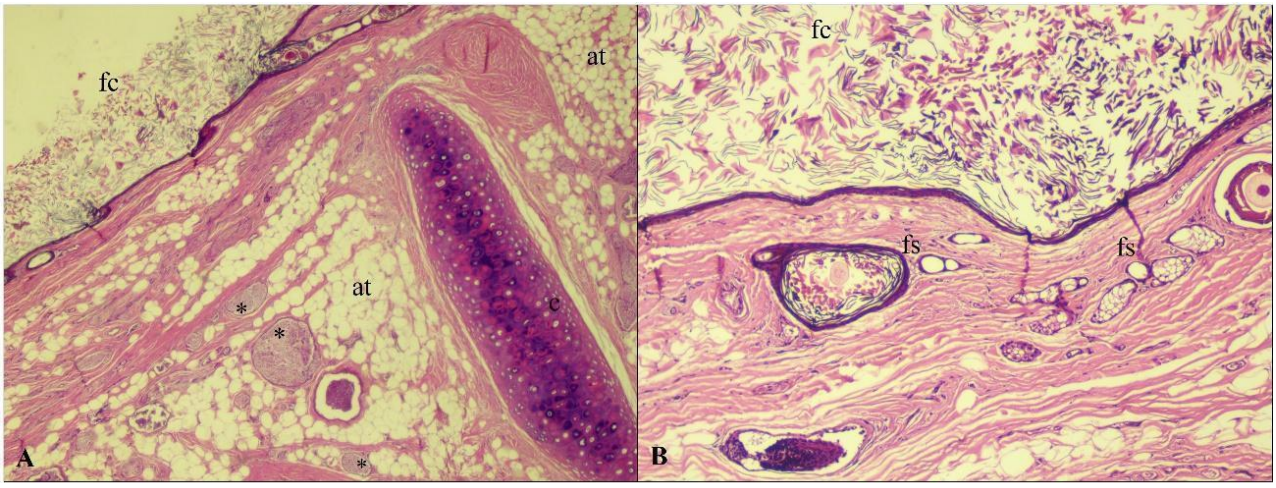

Figure 2. Ovarian teratoma. A - Multiple disorganized mature tissues are seen. There is the formation of a follicular cyst with a lumen full of keratin sheets and hair shafts (fc), adipose tissue (at), cartilage (c) and nerve fibers (*). HE (40X). B - More deposition of connective tissue similar to dermis, with formation of a follicular cyst (fc) and follicle-sebaceous structures (fs). HE (100X).

follicles, sebaceous glands and apocrine glands), as well as cells similar to the epithelium of the retina, loaded with melanin. While in the case described by Oviedo-Peñata *et al.* (2020), this neoplasm was composed of a dentin-pulp complex containing dentin, pre-dentin, odontoclasts and pulp, as well as smooth muscle, sweat glands and bone tissue. Sirivisoot *et al.* (2022) also reported the occurrence of an extragonadal mature teratoma in a feline, near the tail region, composed of teeth, muscle fibers and adipose tissue.

As the histopathological examination identified a benign teratoma, it posed no risk to the animal's health, as the prognosis in these cases is favorable (Patnaik; Greenle, 1987). However, the patient's primary condition led to a guarded to unfavorable prognosis, which unfortunately culminated in death.

CONCLUSION

Ovarian teratoma is a normally benign tumor with a low incidence in female dogs, most of which are diagnosed accidentally during therapeutic or elective surgical procedures or abdominal ultrasound examinations. Salpingo-oophorectomy is the preferred technique for its treatment and definitive diagnosis through histopathological analysis.

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