Fibrothecoma in A Trough Bred Mare with Unilateral Ovariectomy: A Case Report

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INTRODUCTION

Sex cord-stromal (gonadostromal) tumors are clearly the most common ovarian neoplasms in the mare. The most frequent reason for the removal of a pathologic ovary is a granulosa-theca cell tumor (GTCT) 1,2. Other sex cord-stromal tumors such as thecomas have been seldomly reported in the mare 3,4. Although in animals thecoma is included to sex cord-stromal tumors, as granulosa cell tumor (GCT), and fibroma is included to mesenchymal tumors, nowadays in human medicine fibrothecoma (fibrosed thecoma) is included to the tumor of thecoma-fibroma group 5. However, ovarian fibrothecoma has not yet been reported in domestic animals except an aged chimpanzee 6.

In human, the ovarian fibrothecoma is a rare benign tumor which occurs in both pre- and postmenopausal women, growing from the gonadostromal tissue of the ovary 7. Women with these tumors are generally asymptomatic; masses are typically detected with palpation during routine gynecologic examination in middle-aged...
women and elective surgical removal is usually performed. These tumors are almost always benign, but rare cases of tumors with low malignant potential have been reported.

The objective of this report is to evaluate the results of ovarietomy in a trough bred mare that had an ovarian fibrothecoma in the left ovary, and had a 2-year history of infertility and to our knowledge, this is the first case reported in the mare.

**CASE HISTORY**

The case material consisted of a 10 years old trough bred mare, with a tumoral mass in its left ovary and had a 2-year history of infertility. The clinical diagnosis of the ovarian tumor was made by rectal palpation and ultrasonography of the ovaries. Using the flank approach the mare was operated successfully. The mare in question stayed infertile post-ovariectomy and the contralateral ovary stayed small and inactive.

At gross inspection of the removed ovary (14 x 9.5 x 8 cm) a tumoral mass with whitish-yellow and whorled appearance was observed (Fig. 1A). In the sectioning process the mass revealed to be predominantly solid and firm, containing few miliary bloody areas.

The removed left ovary was fixed in formalin, put through routine processes for sectioning and sections were stained with hematoxylin-eosin (HE) and Mallory’s triple stain for histological examinations. Immunohistochemical procedure were performed with a standard labeled streptavidin-biotin-peroxidase method using a commercially available kit (TP-125-HL, ready to-use; Lab Vision, USA). Selected sections of the tumor were marked with monoclonal antibodies to vimentin (1:400, Neomarkers, USA), desmin (1:100, Neomarkers, USA) and smooth muscle actin (SMA) (1:200, Neomarkers, USA).

Histologically, the tumor was observed to be composed of uniform spindle cells arranged in sheets and intersecting fascicles. The stroma showed loose areas as well as strong fibrous areas containing intercellular collagen, which was stained bluish with Mallory’s triple. In some areas, thick hyaline fibrous plaques were observed. Focally, the spindle cells showed abundant vaculated cytoplasm, which was a feature for thecal differentiation (Fig. 1B). Tumoral nuclei were bland and slim with pointed ends and indistinct nucleoli. Neither sex cord islands nor granulosa cells were observed in that tumor. The mitotic amount in these areas averaged less than 2 cells per 10 HPF. These features were diagnostic for fibrothecoma.

Focally within the tumor, there were well circumscribed and variably sized vascular spaces filled with erythrocytes and lined by a single layer of uniform endothelial cells. Those features were descriptive for hemangioma which can be commonly found in the ovary.

At the results of immunohistochemical staining, the spindle-shaped neoplastic cells were positive to vimentin (Fig. 1C). Only weak tram-track immunoreactivity was demonstrable for desmin and SMA, despite the strongly positive immunoreactivity detected in the tunica media of blood vessels, which served as internal positive controls for desmin and SMA antibody (Fig. 1D). Those findings were consistent with a case of fibrothecomatosus tumor.

**DISCUSSION**

Tumors derived from sex cord-stromal tissues of the ovary can produce varying amounts of progesterone, estrogen and inhibit, and these hormones can profoundly influence the productive behavior of the affected animal and induce changes in extra-ovarian tissues. Animals with hormonally productive sex cord-stromal tumors often exhibit abnormal reproductive behavior that may range from estrogenic activity to masculinization. Progressive increase in tumor size, hormone production and infertility necessitate removal. Removal of the affected ovary can enable the contralateral ovary to have a normal reproductive potential. The concurrent or non-concurrent occurrence of bilateral GTCT in mares appears to be rare. In our case the mare with ovarian fibrothecoma stayed infertile.

Ovarian sex cord-stromal tumors are a heterogeneous group of neoplasm which may be confused morphologically with a wide variety of tumors. The ovarian fibroma and thecoma are not two different neoplasms but are variants of a single neoplasm with a common origin from the ovarian stroma. In human, the term fibrothecoma has been used on neoplasms which are intermediate between theca cell tumor and fibroma. The precise distinction between fibromas and thecomas can be difficult and sometimes impossible to ascertain. Histologically, the fibroma cells are thin and spindly. The thecoma cells are less spindly, ill-defined, oval or rounded, showing abundant, pale, and vacuolated cytoplasm containing lipid. Most often, both fibromatous and thecomatous elements, as in our case, are found in the same tumor in varying proportions. However, neither sex cord islands nor granulosa cells were seen in the fibrothecomatosus tumor. On the other hand, thecomas and fibromas form a spectrum of benign tumors extending from lipid-rich thecomas, with estrogenic activity and little fibrosis, to pure fibromas, with no theca cells and no estrogenic activity. Thecomas or fibrothecomas, reflecting populations of both theca cells and fibroblasts with estrogenic activity are less common than GTCTs and these tumors commonly manifest with from estrogenic activity to virilization. Pure fibromas are commonly bilateral. In our case the mare had unilateral ovarian fibrothecomatosus tumor.

Stromal tumors of the ovary include thecoma and...
fibroma, yet in human when the differentiation between these two types may be difficult the term fibrothecoma has emerged in recognition. The immunohistochemical features of these tumors resemble both thecoma and fibroma. Recently, although there are specific markers for the differentiation of sex cord-stromal tumors, those markers do not work properly in some cases. In our case, although positive staining with antibodies against vimentin assists in confirming a sex cord-stromal tumor, immunohistochemistry performed here was not distinguishable. Besides, the weak staining for SMA and desmin helped the exclusion of strongly stained SMA and desmin positive leiomyoma.

In conclusion, a case of fibrothecoma arising in a mare ovary is described. However, the criteria used for the diagnosis of this fibrothecoma which is called fibrosed thecoma were based on the morphological and histological features. Both fibromatous and thecomatous elements were found in the tumor in varying proportions. This fibrothecomatous tumor showed no minor sex cord elements with granulosa cell and steroid cell morphology.

To our knowledge, this is the first reported case of an ovarian fibrothecoma in a mare.

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