

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

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Summary

A solid and firm tumor, covering the whole left ovary was detected in 10 years old a troughbred mare, which had a 2-year history of infertility. The cut surface of the mass was whitish-yellow with whorled appearance. Histologically, tumor was composed of uniform spindle cells arranged intersecting fascicles. Intercellular kollagen, which was stained blue with Mallory's triple was observed in stroma. Focally, the spindle cells showed abundant vacuolated cytoplasm, which was a feature for thecal differentiation. Neither sex cord islands nor granulosa cells were observed in that tumor. The mitotic amount averaged less than 2 cells. Immunohistochemically, the spindle-shaped neoplastic cells were positive for vimentin, whereas only weak tram-track immunoreactivity was demonstrable for desmin and smooth muscle actin. Based on the morphological and histological features, the tumor was classified as a fibrothecoma.

Keywords: *Fibrothecoma, Sex Cord-Stromal Tumors, Immunohistochemistry, Mare*

Tek Taraflı Ovariectomi Yapılan Bir İngiliz Atında Fibrotekoma: Olgu Sunumu

Özet

İki yıldır kısırılık izlenen, 10 yaşında İngiliz ırkı bir kısrağın sol ovaryumunda bütün ovaryumu kaplayan sıkı-solıt yapıda tümöral kitle saptandı. Kitlenin kesit yüzü beyaz sarı renkte ve helazonik görüntüdeydi. Histolojik olarak keşisen demetler oluşturan, mekik şekilli bir örnek hücre kümeleri izlendi. Stromada Mallory'nin triple boyası ile maviye boyanan intersellüler kollagen içeren sıkı fibröz alanların yanısıra, gevşek alanlar da izlendi. Odaksal olarak mekik hücrelerinde tekal differensiyasyonun belirtisi olan, çok sayıda vakuolizasyon izlendi. Tümöral kitlede ne seks kord hücreleri adacıkları ne de granuloza hücreleri izlendi. Mitotic indeks ortalama 2 hücre ve daha azdı. İmmunohistokimyasal olarak mekik şekilli hücreler vimentin ile pozitif olarak işaretlenirken, bazı bölgelerde desmin ve düz kas aktini ile tren rayı görüntüsünde zayıf immunreaksiyon izlendi. Morfolojik ve histolojik bulguların ışığında tümör fibrotekoma olarak adlandırıldı.

Anahtar sözcükler: *Fibrotekoma, Seks Kord-Stromal Tümörler, İmmunohistokimya, Kısırak*

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



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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 reported⁸.

The objective of this report is to evaluate the results of ovariectomy 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 vacuolated 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 cell. 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 fibrothecomatous tumor.

DISCUSSION

Tumors derived from sex cord-stromal tissues of the ovary can produce varying amounts of progesterone, estrogen and inhibin, 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^{1,2}. 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^{3,9,10}. The concurrent or non-concurrent occurrence of bilateral GTCT in mares appears to be rare¹¹. 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 stroma¹². 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 ascertain¹³. 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 lipid⁹. 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 fibrothecomatous 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 virilization¹⁴. Pure fibromas are commonly bilateral⁵. In our case the mare had unilateral ovarian fibrothecomatous tumor.

Stromal tumors of the ovary include thecoma and

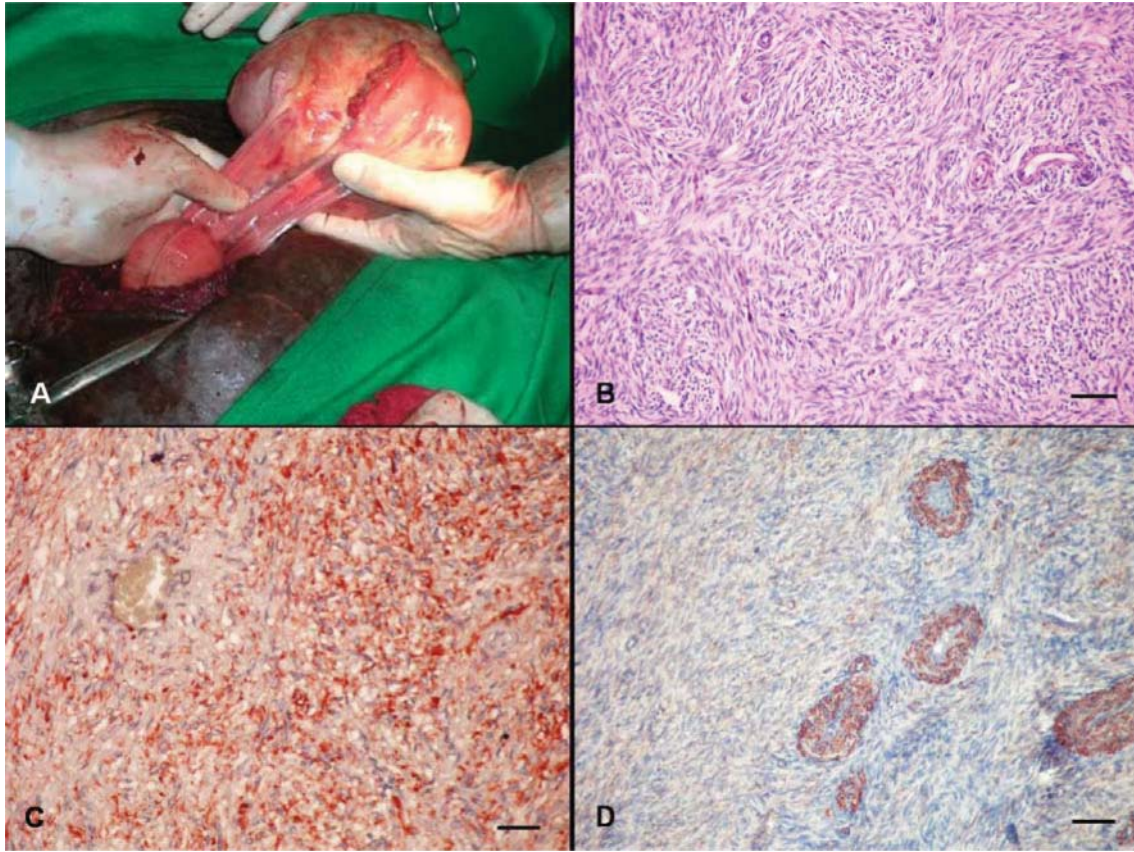


Fig 1. (A) General view of mare's left ovary. **(B)** Microscopic features of ovarian fibrothecoma with round and spindle shaped nuclei, without atypia and lack of mitotic figures. HE, Bar 50 µm. **(C)** Positive staining for vimentin in ovarian fibrothecoma. Labeled streptavidin-biotin-peroxidase and Mayer's hematoxylin counterstain, Bar 50 µm. **(D)** Only weak tram-track immunoreactivity for SMA. Labeled streptavidin-biotin-peroxidase and Mayer's hematoxylin counterstain, Bar 50 µm

Şekil 1. (A) Kısırağın sol ovaryumunun genel görüntüsü. **(B)** Atipi ve mitotik figür izlenmeyen, yuvarlak ve mekik tarzı çekirdekli ovariyal fibrotekomanın mikroskopik görüntüsü. HE, Bar 50 µm. **(C)** Ovariyal fibrotekamada vimentin ile pozitif boyanma. İşaretli streptavidin-biotin-peroksidaz ve Mayer hematoksilen zemin boyası, Bar 50 µm. **(D)** SMA ile tren rayı görüntüsünde zayıf immunreaksiyon. İşaretli streptavidin-biotin-peroksidaz ve Mayer hematoksilen zemin boyası, Bar 50 µm

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 fibroma¹⁵. Recently, although there are specific markers for the differentiation of sex cord-stromal tumors, those markers do not work properly in some cases^{16,17}. 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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