



## OVARIAN TUMOR

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A 14-year-old Quarter Horse mare was referred to the Veterinary Teaching Hospital, Colorado State University for evaluation of an enlarged ovary. The mare was initially examined by a veterinarian as part of a routine pre-breeding evaluation. The owner reported that the mare had not been observed in heat recently and had not noticed any behavioral abnormalities.

Palpation and ultrasound evaluation of the reproductive tract revealed an enlarged left ovary (approximately 4 to 5 inches in diameter) and a small, inactive right ovary. On ultrasound, the left ovary appeared to consist of hundreds of cystic pockets scattered throughout the enlarged structure. A presumptive diagnosis was made of a granulosa cell tumor involving the enlarged left ovary.

In order to help confirm the initial diagnosis, a blood sample was collected and evaluated for levels of the hormones inhibin, testosterone, and progesterone. Previous research had indicated that inhibin and testosterone concentrations are elevated in the blood of approximately 90% and 60%, respectively, of mares with known granulosa cell tumors and that progesterone levels should be low in affected mares. In this mare, the blood level of inhibin was at the high end of the normal range, testosterone

level was within normal limits, and the progesterone level was low.

The classic multicystic ultrasound appearance of the enlarged left ovary and the inactivity of the opposite ovary were convincing evidence of an ovarian tumor. Surgery was subsequently performed and the enlarged ovary was removed. A small biopsy section of the ovary was harvested and evaluated by a veterinary pathologist. The histological diagnosis was that of a granulosa-theca cell tumor.

The granulosa cell tumor is by far the most common ovarian tumor of mares. They are typically slow growing and benign, meaning that they do not usually metastasize or spread to distant sites. A majority of granulosa cell tumors are hormonally active and produce large quantities of inhibin and/or testosterone. Increased levels of inhibin cause a reduction in follicle stimulating hormone (FSH) production from the pituitary. Follicular activity in the otherwise normal opposite ovary decreases in response to the lower blood levels of FSH. Eventually the opposite ovary becomes small and virtually devoid of follicles.

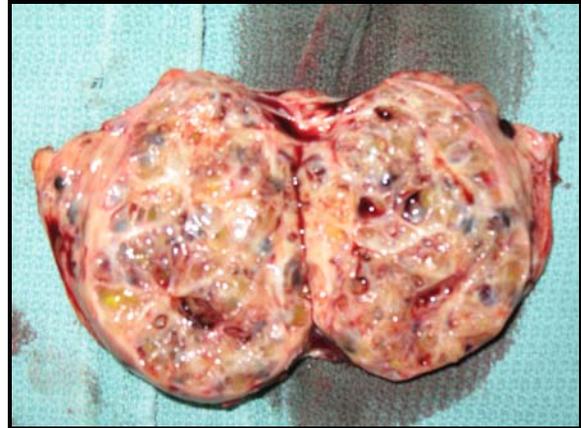
Mares with granulosa cell tumors that have very high levels of testosterone in their blood may exhibit aggressive or stallion-like behavior. Affected mares with normal (i.e.

low) testosterone levels are generally anestrus (i.e. do not exhibit any cyclic behavioral estrus). A few affected mares may exhibit continuous estrus or heat. The mare in this case did not have elevated testosterone in her blood and did not show any aggressive behavior or any recent signs of estrus.

Surgical removal of the affected ovary is the treatment of choice. It may take 4 to 6 months or more for follicular activity to resume in the opposite ovary. In general, mares usually begin to cycle the following spring or early summer after surgical removal of a granulosa cell tumor.

Take home message(s):

1. The granulosa cell tumor is the most common ovarian tumor of the mare.
2. Affected mares have one enlarged ovary and a small, inactive opposite ovary.
3. The involved ovary usually appears multicystic on ultrasound.
4. Levels of inhibin and testosterone may be elevated in mares with a granulosa cell tumor.
5. Surgical removal of the affected ovary is the recommended treatment.



**Photo of the granulosa cell tumor**