

## *Granulosa Cell Tumors in the Mare*

Lauren Hughes, DVM

The granulosa cell tumor (GCT) is the most common ovarian tumor affecting the reproductive tract of the mare.<sup>1</sup> These tumors often present in middle aged mares and can have a slow and insidious onset and progression. They typically affect only one ovary but cases where both ovaries are affected have been observed. These tumors derive from sex cord-stromal cells and usually consist of granulosa cells but can also contain thecal cells. Diagnosis and treatment is often successful and can help to return many affected mares to a reproductive future.

### Clinical Signs

Mares affected by a granulosa cell tumor can display variable clinical signs. Increased aggression and stallion like behavior is often reported especially with more developed and functional tumors. Signs of estrus or heat can be significantly prolonged or absent, cycles may be irregular, and colic signs can also be seen.<sup>2</sup>

### Diagnosing

Accurate diagnosis is often made using a combination of clinical signs and ultrasonography. Trans-rectal ultrasound allows a veterinarian to fully evaluate the structure of the ovaries. In cases of GCT, the affected ovary is often much larger and has a multi-cystic appearance similar to that of a honeycomb.<sup>1</sup> The size of the affected ovary can be quite variable depending on how long the tumor has been present and how fast it progresses. The unaffected ovary is often small and inactive due to repression from the hormones being secreted from the GCT. The image below depicts this with the ovary on the left of the screen enlarged and cystic (affected with GCT) and the right ovary being small and inactive (not affected) in comparison.

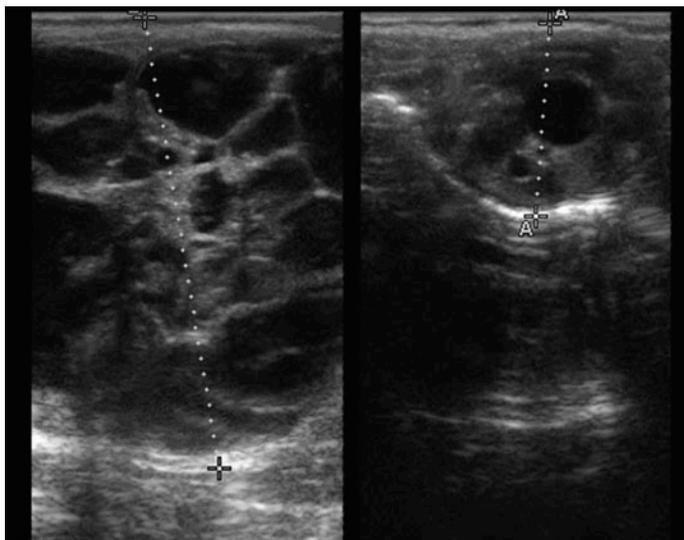


Fig. 1. Granulosa Cell Tumor (Left) and Smaller Unaffected Ovary (Right)

Hormone testing is also beneficial to aid in diagnosis and normally consists of a panel containing inhibin, testosterone and progesterone. Inhibin levels are the most consistently elevated with 85%-90% of affected mares showing increased levels.<sup>1-2</sup> Testosterone can also be elevated in cases of GCT but is less reliable with 50-56% of affected horses showing elevation.<sup>1-2</sup>

### Treatment

Diagnosed GCT's are often surgically removed due to their propensity to continually affect behavior, cyclicity and possibly cause colic. This surgery is termed an ovariectomy, meaning surgical removal of the ovaries. A variety of surgical approaches are possible including laparotomy, colpotomy or laparoscopy. Laparotomy involves making an incision, obtaining the affected ovary, and removing it. Due to the anatomy of the reproductive tract and the location of the ovaries exteriorization and visualization can be quite difficult. Colpotomy, removal of the ovaries through the vaginal wall, is another technique that can be used.

Due to the difficulties with visualization using other approaches, laparoscopy has become a good option for many mares. This involves the use of skin portals to place instruments and a video scope into the abdomen and remove the affected ovary or ovaries. This technique has many advantages including better visualization and ability to control bleeding, less tension on the ovarian pedicle, and the ability to use standing sedation in place of general anesthesia. The image below depicts two ovaries that are being removed via laparoscopic ovariectomy.

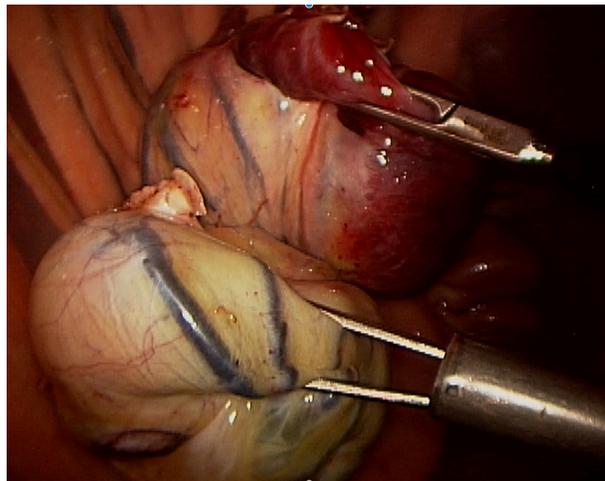


Fig 2. Laparoscopic Ovariectomy

### Prognosis

Overall, mares undergoing surgical removal of a GCT tend to have a favorable prognosis. In cases where one ovary was removed, mares can go on to cycle regularly and still have the ability to conceive and carry a foal. It is important to note that normal cyclicity can take up to 6-8 months to return after surgical removal of the affected ovary.<sup>2</sup> As with any surgical procedure, intra-operative and post-operative complications exist but are minimized with good surgical technique and care during the post-op period.

If you have any questions or concerns please do not hesitate to contact the doctors of New England Equine Medical & Surgical Center. We are happy to be able to provide the option of laparoscopic ovariectomy surgery to our clients and patients.

Sources

1. Auer and Stick. Equine Surgery. 4<sup>th</sup> Edition. 2012.
2. McCue, Patrick. Ovarian Tumors. Colorado State University Equine Reproduction Laboratory.  
Fig 1. Granulosa Cell Tumor (Left) and Smaller Unaffected Ovary (Right). Reproductive Disorders. Chapter 12. Veteriankey  
Fig 2. Laparoscopic Ovariectomy. New England Equine Medical & Surgical Center.