OVULATION FAILURE

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In the normal sequence of events, a non-pregnant mare will return to estrus or heat after being out of heat for approximately 2 weeks. A single ovarian follicle will emerge from a group of follicles within a 'follicular wave' and will become the dominant follicle of that estrous cycle. The dominant follicle will grow at a rate of 3 to 5 mm per day until reaching 40 to 45 mm in diameter. Estrogens produced by the dominant follicle will stimulate estrous behavior, cause cervical relaxation, promote edema formation or folds within the uterine lining, and increase secretion of luteinizing hormone (LH) from the pituitary. In most instances, the LH surge will promote the final maturation of the dominant follicle and induce ovulation.

Unfortunately, not every estrous cycle culminates in ovulation. Ovulation failure is a significant cause of reproductive inefficiency and economic loss in the mare. Since affected mares do not ovulate, fertilization and pregnancy cannot occur. In addition, ovulation failure results in a prolonged interovulatory interval, which translates into more days open and higher subsequent costs.

The incidence of ovulation failure has been reported to range from 3.1 to 8.2% of all equine estrous cycles. Older horses have a higher incidence of ovulation failure, as approximately 13% of mares greater than 15 years of age experience ovulation failure at least once during a given breeding season. A high percentage of mares that develop one anovulatory follicle will experience other cycles culminating in ovulation failure during the same breeding season. An occasional mare will develop anovulatory follicles during repeated estrous cycles throughout a breeding season.

It is difficult, if not impossible with our current diagnostic techniques, to predict whether or not a follicle is destined for ovulation failure as a mare first comes into heat. The initial growth patterns of follicles that ultimately fail to ovulate appear normal and affected mares exhibit behavioral estrus and have normal patterns of uterine edema in a majority of cases. The first indication of a problem is the detection of numerous white particles within the follicular fluid during ultrasound examination when follicles are 35 to 40 mm in diameter. A progression from echogenic particles and strands to complete infiltration of the follicle lumen with echogenic tissue is common.

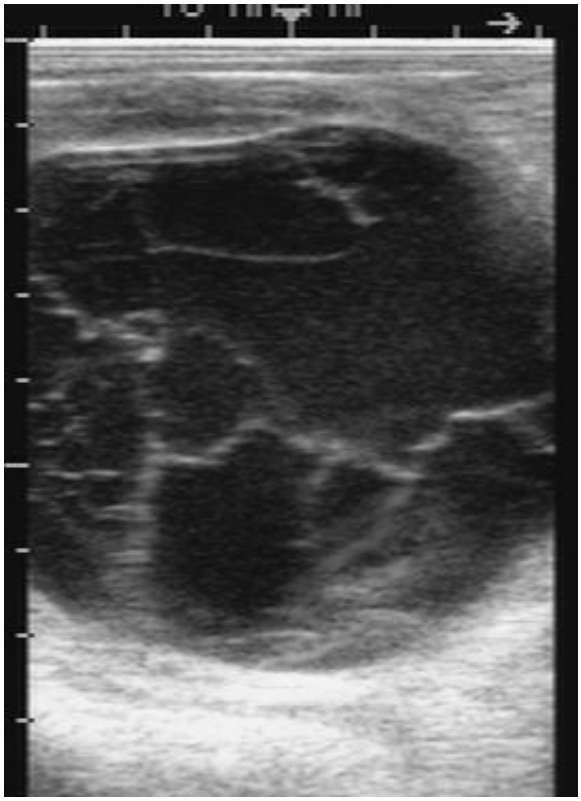
The vast majority of anovulatory follicles turn into large luteal structures that produce the hormone progesterone. In the normal sequence of events, progesterone is produced by the corpus luteum that forms after ovulation. In cases of ovulation failure, affected follicles can luteinize without ovulating. The clinical importance of this observation is that most of these abnormal structures can be successfully and easily

treated with a single administration of prostaglandins. Treated mares will return to heat within 4 to 5 days and will begin to develop another follicle. The abnormal ovarian structure may persist for more than a month if left untreated.

In some mares, the anovulatory follicle will not develop into a luteal structure and will not produce progesterone. Unfortunately, these persistent follicles will not respond to prostaglandins. However, the good news is that persistent follicles are transient structures that will usually disappear in 1 to 3 weeks. Affected mares may develop a new follicle despite the presence of the persistent anovulatory follicle and may even come into estrus and ovulate.

Specific causes of ovulation failure in mares are unknown. Theories have included insufficient estrogen production, an inadequate LH surge and previous hormone therapy. The latter is an unlikely cause as an equal percentage of mares will develop anovulatory follicles with or without prior exposure to exogenous hormones.

Treatment options for anovulatory follicles are limited. Fortunately, prostaglandins are effective in causing regression of the more common luteal-type and the less common persistent follicular-type will spontaneously regress over time. A key for the future is to determine the cause of ovulation failure so management can be based on prevention rather than post-formation treatment.



Ultrasound photo of an anovulatory follicle