

****Use of a Glass Ball to Suppress Behavioral Estrus in Mares****

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A 35-mm glass ball placed in the uterus within 24 hours following ovulation will result in a prolonged luteal phase in approximately 40% of mares. Progesterone levels remain elevated in these mares for nearly 3 months. Employing this technique avoids the need for daily administration of efficacious progestin products or intermittent administration of non-efficacious products for the purposes of behavioral estrus suppression in performance mares. Authors' addresses: Department of Clinical Sciences (Nie, Johnson, Wenzel); Department of Anatomy, Physiology, Pharmacology (Braden), College of Veterinary Medicine, Auburn University, AL 36849-5522. © 2001 AAEP.

1. Introduction

Owners are seeking veterinary assistance more and more frequently to suppress behavioral estrus in their performance mares, hoping that this will result in the mares training or performing better. Practitioners are then put in the precarious situation, due to industry pressures, of having to employ a variety of progestin products, off-label, without evidence of efficacy. The only truly effective means of suppressing behavioral signs of estrus in most mares is to maintain sufficient levels of circulating progesterone. The only documented ways that a sufficient level of progesterone or its equivalent can be maintained is through the presence of a functional corpus luteum (CL), daily intramuscular administration of exogenous progesterone (e.g., \$50 mg in oil), or daily oral administration of a synthetic progestin (e.g., Altrenogest).¹⁻³ Some of the other progestin products, labeled for use in other species, have been demonstrated to be ineffective for suppressing behavioral estrus in mares.^{4,5} Another concern regarding the off-label use of cattle implants is the potential regulatory consequences that may come about from the illegal use or abuse of such products.⁶ Recent communications on a popular equine email list suggested that a small glass ball of ; 30 mm in diameter, placed in the uterus of a mare, would result in luteal maintenance.^b Prolonging the luteal period results in continually elevated circulating progesterone levels sufficient to suppress behavioral estrus in most mares. This approach takes advantage of endogenous progesterone production and avoids using other hormones, off-label and without evidence of efficacy.

2. Materials and Methods

A 35-mm glass ball is placed in the uterine body within 24 hours following ovulation. The glass ball can be sterilized prior to placement using an autoclave cycle for fluid. The long, slow cool-down phase of a fluid cycle will avoid breakage. In preparation for placement of a uterine glass ball (UGB) the perineum should be cleaned as for any vaginal procedure. Using a sterile palpation sleeve, a UGB is carried vaginally to the caudal cervical os. The UGB is passed through the cervical lumen and into the caudal uterine body. Following placement, the UGB can be located per rectum and pushed forward to the horn-body junction. After placing a UGB, 1 gm of Ticarcillin is infused to cover for bacterial contamination. Also an ecboic can be administered to help clear the uterus of contaminants before the cervical lumen closes under the influence of progesterone. In order to facilitate UGB removal, a mare should be in peak estrus. Removing a UGB is an easily learned procedure with a minimum of practice. Occasionally a mare may need to be lightly sedated during the removal procedure. Removal is accomplished by manipulating the UGB per rectum and moving it caudally toward the cervix. The

UGB is expelled through a relaxed cervix and into the cranial vaginal vault for retrieval. If the cervix is not fully dilated, a gloved hand can be taken in per vagina to retrieve the UGB from the caudal cervical lumen. Glass balls were removed following 4 consecutive ovulations subsequent to placement when prolonged luteal function did not occur or following ovulation at the end of a prolonged luteal phase.

3. Results

In a study we conducted, 5 of 12 mares (41.7%) experienced prolonged luteal function which lasted a mean of 88.8 days following placement of a 35-mm UGB. Spontaneous expulsion of the UGB was not observed in any of the mares. Plasma progesterone levels were measured to determine luteal function. A mare was defined as having functional luteal tissue as long as progesterone levels remained above 1 ng/ml. The 5 mares that experienced prolonged luteal function maintained a CL for 76, 78, 86, 95, and 109 days respectively. The other 7 mares had a mean interovulatory interval of 20.0 days. Endometrial biopsies were also evaluated before UGB placement and following removal, in order to determine if there were any negative effects on the endometrium. No discernible differences were observed between the pre-placement and post-removal endometrial samples. All glass balls were removed from the mares by mid-fall of last year. As of early summer 2001, 8 of 12 mares have been bred and 3 of 8 have conceived. Most of the others are scheduled to be bred this season.

4. Discussion

We found that a 35-mm diameter glass ball placed in the uterus would result in prolonged luteal function in approximately 40% of mares. At this time it is unclear why or how this occurs. It is interesting, however, that the progesterone profiles in these mares were very similar to those reported for mares hysterectomized 3 days following ovulation.⁷ The primary CL was present 70 days following ovulation in hysterectomized mares, but gone by 140 days.⁷ We found this was also true of mares that experienced prolonged luteal function in response to a UGB. The procedures for placement and removal are relatively simple and the UGB does not appear to be detrimental to the endometrium. The technique takes advantage of endogenous progesterone production to suppress behavioral estrus. Though luteal function was not maintained in every mare, those in which function was prolonged had progesterone levels .1 ng/ml for roughly 3 months. We did not follow the mares beyond their subsequent ovulation, though we expect that if the UGB had been left in the uterus each mare would have experienced another prolonged luteal period. Another researcher related information to us about 2 mares in which a UGB had been placed and had experienced prolonged luteal function.^d Following administration of prostaglandin, both mares returned to estrus, retained the UGB, ovulated, and again experienced prolonged luteal function. None of our mares experienced any endometrial damage detectable with ultrasonic or histologic examination. As of now, the mares that have been bred following removal of the UGB are demonstrating that conception is not impaired. This supports the anecdotal information provided on the veterinarian email list.^b In the messages the researcher indicated that no changes are detectable in the uterine wall by palpation or ultrasonography. Following removal the mare will come back into heat and will breed normally. This veterinarian also indicated that the balls will occasionally be expelled spontaneously, though he has not experienced this problem. In our study we used a 35-mm UGB instead of the 30-mm size suggested. Also, basing our protocol on preliminary data, we placed the UGB following ovulation. Our findings agree with the preliminary information that spontaneous expulsion was not a problem. Our results, however were not quite as good as those reported on the email list. He indicated that the technique works in at least 75% of cases. We only found that ;40% of

mares experience prolonged luteal function. No detrimental effects were observed in our study, though one might suspect that inducing prolonged luteal function could result in endometrial damage if microbial contaminants are introduced when the UGB is placed. Two mares did have a very small amount of fluid around the UGB, as observed with ultrasound, a day or so following placement. However, the condition did not progress in any of the mares. Nevertheless, it may be advisable to examine a mare with ultrasound several days following UGB placement to ensure a detectable endometritis has not developed. This technique offers the advantage of suppressing behavioral estrus as a result of endogenous progesterone production. The disadvantage is that it does not work in every mare. However, when it is effective the need for daily administration of efficacious progestin products or intermittent administration of off-label, non-efficacious products is avoided.

**** Exodus Breeders Corporation accepts absolutely no responsibility for the success, failure and/or the potential long-term negative effects of a uterine glass ball (UGB) and/or marble that is used to attempt the suppression of estrus in a mare. This research is publicly available for the absolute and final discretion of the end user.**