Post-Breeding Endometritis: A Common Cause of Reproductive Failure in Mares

Young mares and mares with healthy reproductive tracts usually conceive easily and carry a foal to term without difficulty. Attempts to get some older mares and mares with reproductive problems pregnant can be very frustrating and costly. In this article I discuss a few of the factors that result in uterine problems. I then describe the diagnosis, treatment and management of mares with post-breeding endometritis, the most common cause of mare infertility. Understanding the basics of how the equine reproductive tract functions will help you to understand the problems that can develop.

THE EQUINE UTERUS

The uterus is a muscular, hollow organ with a lining that is designed to attach to a placenta and provide the nutrients needed from the mare to sustain a foal. The uterus is protected from the outside world by several barriers to infection. The vulva forms a tight seal and helps to keep contaminants out of the vagina and uterus. The cervix is a thick tube (separating vagina from uterus) that tightens when a mare is out of heat and softens and opens during the heat cycle.

Mares cycle regularly during the spring summer and early fall and go into a period of reproductive quiet during the winter months. In a normal mare, there is delicate communication between the ovaries, cervix and uterus. This communication functions to allow fertilization to take place, then switches gears and provides an environment for the embryo to grow. Any disruption of this complex process results in failure to conceive or failure to maintain a pregnancy to term.

Estrus (heat) in horses lasts about 7 days out of a 21 day

cycle. During heat, the cervix is open and the uterine defenses are primed. The uterus is ready to receive sperm and fight off infection. The ovaries produce follicles (bubbles on the surface of the ovaries containing the ova or eggs) that grow in size over the 7-day period until ovulation (rupture of the follicle) takes place at the end of estrus. The egg resulting from the ovulation passes into the oviduct, a thin tube leading to the uterus.

Each time a mare is bred, sperm is deposited directly into the uterus, and migrates within four hours up to the tips of the oviducts, where it waits for the arrival of the egg at ovulation. Sperm can survive for days here. Once ovulation takes place, these sperm are in a position to fertilize the egg. The now fertilized egg (embryo) stays in the oviduct for about 6 days before entering the uterus. At this time it migrates slowly back and forth from tip of one uterine horn to the tip of the other, before attaching to the uterine wall at about day 16.

The uterus of a pregnant mare is sterile, there are no bacteria present. When a stallion breeds a mare, there are huge quantities of debris and bacteria brought into the uterus along with the sperm. The mare must be able to take the uterus from this state of contamination to the clean state necessary to support the young embryo when it arrives 6 days later. How it does this is a miracle! Millions of inflammatory cells recruited to the uterus during estrus devour bacteria and debris. Strong muscular uterine contraction expel fluid, dead sperm and debris from the uterus through the open cervix. Once this cleanup process takes place, the uterus is guarded by several barriers to infection. The tight, closed cervix and the vulvar seal protect the uterus through pregnancy from contamination from the outside world.

Post-breeding endometritis (mating induced endometritis) is the most common causes of mare infertility. It is inflammation of the inner uterine lining, or endometrium, following

breeding. Older mares and mares with poor uterine function commonly have this problem. In older mares, there is loss of muscular function, and the uterus often lies in a lower orientation in the abdomen, making clearance of fluid and debris more difficult.

While bacteria can be involved in this problem, they are more often not the direct cause. Sperm themselves, along with the other products introduced into the uterus at mating, induce a strong inflammatory response in the normal uterus. In a normal mare though, the uterus has resolved this inflammation after 24 to 48 hours. In a mare without the ability to clear the uterus, there is still inflammation and irritation going on when the embryo arrives. This is often recognized on an ultrasound by accumulation of fluid in the uterus. In normal mares, this fluid is cleared by 24 hours after breeding. In abnormal mares, there is still significant fluid accumulation at this stage.

Severe scarring of the uterine lining may result from ongoing, untreated endometritis. This may ultimately make the uterus incapable of supporting a pregnancy to term, and make the mare irreversibly infertile.

THE VETERINARY DIAGNOSIS

The main tools used for diagnosis of breeding problems in the mare are rectal palpation, ultrasound, uterine culture, cytology, biopsy, and the cervical exam.

- Ultrasound through the rectal wall allows detailed visualization of much of the reproductive tract. It is especially good at detecting even small quantities of fluid within the hollow center of the uterus. Fluid accumulation found during estrus (and more than about 8 hours after breeding) is a good indicator that treatment will be necessary to achieve pregnancy.
- Uterine culture identifies bacteria, which may be significant in the uterine inflammation. Cytology is

the study of the cells collected by swabbing the inside of the uterus and is used with culture.

- Uterine biopsy is a vital diagnostic tool. It requires the use of a long handled instrument to take a pinch of tissue from the inner uterine lining. This tissue is examined under the microscope to determine the nature of the problem and to determine whether or not the lining is suitable to maintain a foal to term.

TREATMENT

One goal is to breed mares as few times as possible in the heat cycle, at just the right time, which is usually toward the end of heat. The idea is to get adequate sperm up in the oviducts, where it is ready to fertilize the ovulated egg, while introducing as little foreign material into the uterus as possible. Because the sperm migrate to the tips of the horns, we are able to lavage (flush) out the debris from the uterus 4 to 12 hours after breeding without flushing the live sperm out. This cleans up the uterus, allowing the embryo to migrate into a hospitable uterine environment. Sometimes the mare is lavaged before breeding as well.

Drugs are often used which cause the uterus to contract, forcing the fluid out. Some mares require treatment with uterine antibiotics. Mares with vulvar conformation problems may need a Caslick's operation to restore the barrier function of the vulva. Mares with cervical problems will need to have those addressed as well.

GENERAL TIPS TO PREVENT BREEDING PROBLEMS IN MARES

- It is always easiest to attempt to breed young mares that are reproductively healthy.
- Buy mares with the reproductive history and conformation to be easy breeders.
- Learn as much as possible about equine reproduction so that you understand the process and can make good decisions.

- Breeding old, maiden (never bred) mares is difficult. Try to breed maiden mares before 10 years of age if possible.
- If you have a mare that does not breed, immediately seek the advice of a veterinarian who is experienced in managing problem mares.

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