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The Problem Mare: Oviductal and Cervical Abnormalities

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Common Reproductive Problems of the Oviduct and Cervix

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<th>Oviduct</th>
<th>Cervix</th>
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<td>Failure of cervical relaxation</td>
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<td>Oviductal blockage</td>
<td>Cervical adhesions</td>
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<tr>
<td>Salpingitis</td>
<td>Tumor (i.e. leiomyoma)</td>
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Oviductal Abnormalities

The oviduct plays a critical role in the reproductive process by serving as a sperm reservoir, collection and nourishment of the oocyte, site of fertilization, incubation of the early embryo, and active transport of the maturing embryo through the isthmus and utero-tubular junction into the uterus. The oviduct is a difficult structure to evaluate either morphologically or functionally. Abnormalities of the oviduct include inflammation, adhesions, fibrous bands, cysts, hydrosalpinx, neoplasia, and oviductal masses.

Gelatinous masses that contain fibroblast cells may occlude the lumen of the oviduct and either prevent sperm from reaching the site of fertilization or prevent an embryo from reaching the uterus have been reported. The number of oviductal masses has been reported to increase with mare age and masses are most commonly located at the ampullary-isthmic junction.

Diagnosis of oviductal blockage can be challenging. An early procedure to diagnose oviductal blockage involved the application of starch granules to the infundibulum of the oviduct followed by an attempt to recovery the starch granules from the uterine lumen. This was later adjusted to application of colored fluorescent beads or microspheres to the infundibulum and then flushing the uterus to look for color-coated beads or microspheres in the uterine effluent.

Flushing the oviduct via a ventral midline surgical approach has been noted to result in an increased pregnancy rate in mares with previously unexplained infertility. In addition, a laparoscopic procedure for catheterizing and flushing the equine oviduct has recently been described.

Treatment

Direct laparoscopic application of PGE₂ to the oviductal surface of mares with unexplained infertility has been reported to result in a return to fertility in a majority of treated mares. A recent study noted that 18 of 19 subfertile mares treated laparoscopically with topical PGE₂ to the oviductal surface became pregnant or donated embryos after the procedure.

Abnormalities of the Cervix

In a reproductively normal mare, the morphology of the cervix changes dynamically during the course of the estrous cycle. A mare in heat should have a relaxed cervix that allows access of semen into the uterus at breeding. The presence of sperm in the uterus, introduced by either natural service or artificial insemination, results in an inflammatory response in all mares. In the normal mare, the inflammatory cells, uterine fluid and dead sperm are passed out through the relaxed cervix by uterine contractions. In most mares the inflammation peaks at 8 to 12 hours and is resolved by 24 hours after breeding.

In contrast, an older maiden mare may have a cervix that fails to relax during estrus. As described previously, the presence of sperm in the uterus after mating will result in the expected inflammatory response. However, uterine contractions are unable to evacuate the inflammatory fluid through the closed cervix of the older maiden mare, which results in an accumulation of a large volume of fluid within the uterine lumen. Continued presence of fluid in the uterus will result in failure of the mare to become pregnant.

Anticipation of cervical issues is the key to successful reproductive management of an older maiden mare. A vaginal speculum examination and a digital (manual)
examination of the cervix when the mare is in heat will
determine the degree of cervical relaxation and the
probability of uterine fluid accumulation after breeding. If it
is determined that the cervix is not relaxed sufficiently, the
following management procedures may be implemented.
First, the mare should be bred or inseminated only once,
just prior to ovulation. A timed ovulation can be induced
by administration of human chorionic gonadotropin (hCG)
or deslorelin when a follicle of the optimal size is present
during mid-estrus. Second, the uterus should be rinsed out
or lavaged 4 to 6 hours after breeding. The sperm that will
eventually fertilize the oocyte (egg) will be safe within the
oviduct within 4 hours after breeding. Consequently,
uterine lavage can be performed as early as 4 to 6 hours
after breeding without adversely affecting pregnancy rate.
The goal of uterine lavage is to remove residual sperm,
inflammatory cells and fluid from the uterine lumen and
therefore prevent or limit the post-mating inflammatory
response. Administration of one or more doses of oxytocin
may also be helpful to promote uterine contractions and
evacuation of uterine fluid. An ultrasound examination
should be performed a day or two after insemination to
confirm that the mare ovulated and that the uterus is free of
fluid. If all is well, an ultrasound examination for
pregnancy may be performed 14 to 16 days after ovulation.
In addition, topical administration of prostaglandin E1 or
Buscopan cream may promote cervical relaxation (see
Table below).

The older maiden mare syndrome can usually be prevented
by allowing a mare to carry a foal to term by the time they
are 10 to 12 years of age. Stretching of the cervix that
occurs during foaling will prevent formation of the tight
‘fibrotic’ cervix that is prevalent in older maiden mares.
Mares used exclusively as embryo donors year-after-year
are also at risk of developing a tight fibrotic cervix and
subsequent uterine fluid accumulation. An embryo donor
may be the genetic dam of multiple foals, but unless she is
allowed to carry a foal occasionally she may develop
problems in her reproductive tract that limit their future
reproductive potential. Consequently, it is recommended
that an embryo donor mare also be allowed to carry a foal
to term by the time she is 10 to 12 years old and also be
allowed to carry her own foal every 3 to 5 years to optimize
long-term reproductive health.

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<thead>
<tr>
<th>Medication</th>
<th>Dosage, Route, Frequency</th>
<th>Indications</th>
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<tbody>
<tr>
<td>Prostaglandin E1, (100 µg/tablet)</td>
<td>1,000 to 2,000 µg, topically onto cervix, as needed</td>
<td>Cervical relaxation</td>
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<tr>
<td>N-Butylscopolammonium cream (Buscopan®)</td>
<td>Topical cream</td>
<td>Cervical relaxation</td>
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