Surgical Evaluation of Oviduct Disease and Patency in the Mare

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Disorders of the oviduct are an uncommon cause of mare infertility. However, pathology may be suspected when all other diagnostics fail to demonstrate a cause for infertility. Oviduct disorders are more common in older mares. Surgical evaluation and correction of oviductal disease can restore fertility of some mares. Author’s address: Equine Services Surgical Hospital, P.O. Box 464, Simpsonville, KY 40067. © 2002 AAEP.

1. Introduction

Oviductal masses and occlusions of the lumen of the oviduct with a collagen-type material has been previously described, and are more prevalent in older mares. Reports of ovaritis, salpingitis, and tubal lesions have also been reviewed. Along with oviductal occlusions, severe fimbrial adhesions, and para-fimbrial cysts large enough to displace the fimbria from proper ovarian engagement may also effect fertility. Unlike other species, the horse has few fimbria permanently attached to the ovary.

The oviduct of the mare is different from most mammalian species with respect to the distal oviduct. In the mare the distal oviduct has a well-developed muscularis, which acts as a sphincter apparatus, making mechanical entry from the uterus difficult. The sphincter apparatus and muscularis of the distal oviduct makes oviductal lavage from the ampulla-to-isthmus direction a necessity. Cannulation of the convoluted distal oviduct from a uterine approach through the utero-tubal junction is exceedingly difficult. The mare also frequently retains unfertilized ova within the oviduct in various stages of degeneration. Although oviduct pathology resulting in infertility in the mare is uncommon, the evaluation of patency and treatment of blockage may be valuable in some mares. The purpose of this report is to describe the surgical procedure for evaluation and treatment of oviduct patency in infertile mares. Conception rates following this treatment are also reported.

2. Materials and Methods

The records of 31 mares referred for a reproductive exploratory, with histories of prolonged infertility for 2–4 breeding seasons were examined. Evaluation of the reproductive tract of all mares using trans-rectal palpation, ultrasound, culture, cytology, biopsy, and hysteroscopy was performed prior to reproductive surgical exploration and oviduct evaluation. All methods of evaluation failed to provide a definitive diagnosis for infertility. Early detection of pregnancy via ultrasound, or embryo flush had failed to demonstrate conception in any of these mares. This group of mares came from highly managed farms, where it was felt that all avenues for the diagnosis of infertility had been pursued.
Mares were fasted for 24 h pre-operatively. Preoperative antibiotics and anti-inflammatories (penicillin G procaine 30,000 I.U./kg i.m. b.i.d., gentamicin 6.6 mg/kg i.v. s.i.d., and flunixin meglumine 1.1 mg/kg i.v. s.i.d.) were administered and continued for 3 d.

The mares were placed in dorsal recumbency under general anesthesia. A pelvic tilt apparatus was used to flex the mare at the lumbo-sacral junction in order to allow easier exteriorization of the reproductive tract through the incision. A 10-cm ventral midline incision is made just cranial to the udder. An ovary and ipsilateral uterine horn are located and exteriorized. A gross examination of the tract is performed looking for fimbrial adhesions, parafimbrial cysts, and obvious oviduct disease. The uterine horn is occluded by using a doyen intestinal forcep, placed 5 cm from the cranial tip of the horn. The oviduct is catheterized in a normograde fashion with a balloon-tipped catheter. The catheter is advanced to the ampulla, and the balloon is inflated with 1.0–1.5 ml of air to occlude the ampulla. Strong digital pressure is applied over the catheter, cranial to the balloon, as 20 ml of a 5% solution of new methylene blue dye in normal saline is slowly injected through the catheter. The oviduct will distend under pressure until the solution passes into the occluded portion of the uterine horn. Confirmation of patency can be ascertained by two methods: 1) Injection and aspiration of 10–20 ml of normal saline into the lumen of the occluded cranial uterine horn to confirm dye within the aspirate; and 2) Injection of 20 ml of air through the oviduct after the dye solution has been injected. This will distend the cranial uterine horn and give a characteristic gurgling sound as air passes into the uterine lumen.

The contra-lateral ovary and uterine horn are exteriorized, and the cranial aspect of this horn is occluded with a doyen intestinal forcep, as previously described. This should be done prior to releasing the first doyen forcep. The oviduct catheterization and lavage is then repeated on this oviduct.

Complete occlusion will result in the inability of the saline-dye solution to enter the uterine horn, or air to pass post-dye injection. With complete occlusion the oviduct may rupture under intense pressure. Saturating the serosal surface of the oviduct with 2% lidocaine hydrochloride may aid in establishing patency in an oviduct that will not allow the passage of fluid. Careful placement of the catheter within the oviduct, so the tip of the catheter is not pushed into the wall of the lumen, will aid in the prevention of iatrogenic damage of the oviduct.

Unilateral, irreversible occlusion or oviductal rupture is treated with unilateral ovarioectomy. Bilateral, irreversible occlusion deletes the mare from conventional breeding methods. Other reproductive abnormalities are also addressed at surgery. Fimbrial adhesions are removed and para-fimbrial cysts are reduced. The Nd:YAG laser has proved to be beneficial with prevention of postoperative adhesions when working with the fimbriae.

A routine three-layer closure is performed. Antibiotics and anti-inflammatory medication are given as previously described. Postoperative care included stall rest for 4 wk, followed by turnout into a small paddock for an additional 4 wk. The mares

Fig. 1. Fimbrial adhesions restricting fimbrial function.

Fig. 2. Paraovarian cyst pulling fimbria away from the ovary, resulting in possible ovulation into the abdominal cavity.

Fig. 3. The ovary on the left has a fimbrial cyst and oviduct blockage. The ovary on the right has an oviduct with normal patency.
were returned to normal routine following this recovery period. Breeding can resume as early as 3 wk postoperatively, but varied with each case.

3. Results

Thirty-one mares were treated. All mares were barren 2–4 yr, and ranged in age from 10 to 24 yr, with a mean age of 18 yr. Of this group, three mares had no apparent disorder or resistance to oviduct lavage. Thirteen mares were determined to be bilaterally occluded. Twelve of the 13 mares were lavaged successfully, and one remained irreversibly occluded, as oviduct lavage was not successful. Six mares had irreversible unilateral blockage that were treated with unilateral ovarioectomy. Three of the six mares with irreversible, unilateral blockage showed evidence of para-oviductal dye, indicating rupture of the oviduct. Nine mares had obvious fimbrial disease (para-fimbrial cysts and fimbrial adhesions), and were lavaged successfully.

Postoperatively, 1 mare in the group of 13 treated for bilateral occlusion was not bred. Eight of the remaining twelve mares treated for bilateral occlusion became pregnant on their first breeding cycle, for a 67% rate of conception. The three with no apparent oviduct disease did not become pregnant. Five of the 6 mares treated for unilateral irreversible occlusion became pregnant during their first cycle, for an 83% rate of conception. Four of nine mares in the group with fimbrial disease became pregnant during their first breeding cycle, for a 44% rate of conception. There were no significant postoperative complications in this group of mares.

4. Discussion

Because disease of the oviduct is not easily evaluated, pathology of these structures may be more common than that reported in the literature. The starch granule method and indirect methods of evaluating tubal patency by ultrasound-guided transvaginal deposition of fluorescent microspheres, though offering diagnostic information, have no modality for treatment of oviductal occlusion as is described in this paper. The tubal-patency technique described in this report is a valuable aid in the diagnosis of infertility, reproductive potential, and treatment of disorders of the oviduct. We believe the group of previously barren mares that conceived following oviductal lavage, provides evidence that oviductal lavage is a therapeutic as well as a diagnostic procedure. This report demonstrates that oviductal disease in aged barren mares should be considered when all other diagnostics produce no evidence of reproductive pathology.

References and Footnotes

12. Cook V-PFCS–30. 8.0 Fr. Foley, 30 cm. 5.0-ml balloon catheter. Cook Veterinary Products Inc., Bloomington, IN 47402.