Foaling Injuries in Mares
John F. Fessler, DVM, MS

The foaling season is upon us and most of our attention is focused on the new youngsters that are being born. Newborn foals are vulnerable to infections, injuries, and other insults at the beginning of life and it is easy to overlook the possible consequences of foaling on the mare. Fortunately serious tears of the mare’s birth canal during the act of foaling are uncommon and, usually, not life-threatening. However, when they occur, such tears result in considerable swelling and discomfort for several days, problems with the evacuation of feces and urine, and infertility. After the initial healing, the mare returns to normal except for the permanent disruption in her perineal tissues. Feces will accumulate in her vagina, her tail probably will be soiled, and objectionable sucking noises may be heard, but she will be normal and useful in every other way. Except, the mare will remain sterile until the defect is surgically repaired.

These so-called perineal injuries are most common in mares having their first foal. Perhaps the mare’s birth canal is somewhat smaller this first time, but, more likely, the mare is nervous and adds to the vigorous straining that accompanies the delivery. Mares are great at being secretive about their foaling, waiting until the middle of the night when nobody is watching. The biggest reason these mares experience tearing is because nobody is available to provide assistance when necessary. Most mares don’t need help, but when they do, the consequences of our absence can be disastrous!

The Routine Castration?
Some Common, and Not So Common Complications
Lynn Chamberlin, DVM

Castration is one of the most common elective surgeries performed by equine practitioners. The procedure is performed for any of the following reasons:
- to decrease masculine behavior
- to eliminate horses that are unsuitable for breeding
- to remove a damaged or injured testicle
- to remove a testicle that is cancerous (uncommon)

Castration is typically performed between 1-2 years of age. At this age masculine behavior becomes more obvious and less tolerable to owners. Castration can be performed in any horse, regardless of age or breed, provided there is adequate restraint and proper anesthesia and surgical technique. Though equine castration is considered routine by many owners and veterinarians, complications can and will occur. Most complications are mild and can be managed successfully. However life-threatening complications can develop. The following list presents some of the common, and less common, complications of castration.

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News & Notes

New Faculty

Dr. Timothy B. Lescun has returned to the Veterinary Teaching Hospital as an Assistant Professor of Large Animal Surgery after spending 18 months as a staff member of the internationally acclaimed Goulburn Valley Equine Hospital in Victoria, Australia. Tim is a native Australian and a 1994 honors graduate of the University of Melbourne. Following an internship with the Goulburn Valley Equine Hospital, he completed his residency training and obtained a Master of Science degree here at Purdue in 1999, and obtained board certification with the American College of Veterinary Surgeons in 2000.

While he was here as a resident, Tim met and married Heidi Leitza, a native of Wisconsin and a large animal technician at the time. We are pleased to welcome both Tim and Heidi back to the Midwest and to the School of Veterinary Medicine.

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Foaling Injuries in Mares (continued from cover)

Training of the birth canal is classified as a first, second, or third degree perineal laceration. The vestibule, or entrance to the vagina, is the rectum, and the tissues in between, called the perineal body, may be involved. First-degree tears involve the mucous membrane lining of the vestibule or the vagina only. The skin of the vulva may also be involved. These injuries may be so minor that they go unnoticed or are accompanied by slight bleeding. The mucosal lining of the vestibule heals rapidly on its own without requiring surgery. If the vulva has been torn, minor surgical reconstruction of the skin may be necessary. This would be like the Caesarean's operation that is used to improve breeding in broodmares.

Second-degree perineal lacerations involve the vestibule, vagina, the vulva, and the perineal body. The tissues between the rectum and vagina. Laceration of these tissues during foaling is obvious. There will be hemorrhage with loose flaps of tissue and a “shredded” appearance to the area. Many second-degree tears heal without any treatment or consequence and with an apparent return to normal of the anus and vulva. Unfortunately, the smooth muscle and elastic support to the anus, vulva, and birth canal have been lost. These orisons become “leaky” and organisms from the rectum gain access to the vagina resulting in various degrees of infertility. Also, pneumovagina and/or pneumovestibulum, so-called wind sucking, may result and be objectionable. If the wind sucking or wind sucking follows second-degree lacerations, surgical correction is possible and usually helpful even though the anus and vulva look normal.

Third-degree perineal lacerations involve all of the tissues mentioned above including the rectum. This is a disastrous injury, both from the initial appearance and from the viewpoint of complications like wind sucking and infertility. Some mares that sustain second degree lacerations may be bred. Mares that sustain third degree lacerations including the rectum will not breed until the rectum and vestibule/vagina have been surgically reconstructed. Fortunately, even though these injuries look awful and feet get into the vagina, third degree lacerations are rarely life threatening. And, after surgery, mares injured this severely return to breeding soundness.

There is another kind of perineal injury that may occur in certain circumstances, the recto-vestibular fistula. When a mare is about to sustain a third degree laceration, a foot of the foal tears through the vagina and rectum and comes out of the anus instead of the vulva. Because of the powerful delivery stage of labor, if the mare is not attended she will force the foal out tearing the perineal tissues as described above and sustain the third degree tear. Should an assistant show up to help at just the right time, he or she can push the foot back into the vagina and assist with an otherwise vaginal delivery. Of course, this leaves the hole between the rectum and vagina to heal as a permanent fistula between these two “tubes.” From gain access to the vagina resulting in swelling in the anus and vulva have been “swept” from injury.

Veterinarians should evaluate the severest of perineal lacerations, giving a booster vaccination for tetanus and helping to decide whether or not antibiotics are needed. Most of these wounds heal without the need for antibiotics even though they look so devastating when first occur.

The swelling goes down rapidly and healing is fast, but the wrong tissues heal together! With third degree lacerations and recto-vestibular fistulas, the mucous membrane of the rectum heals to the mucous membrane of the vestibule or vagina as a permanent opening. There is a large common opening or “doora” that is formed, mandating surgery if the complications like wind sucking and infertility are to be avoided.

The surgery used to reconstruct the “tubes” of the rectum and vagina to recreate the perineal body, anus, and vulva is very specialized. The tissues must be “healed” first. It is impossible to reconstruct shredded, bleeding tissue right after the injury and expect a good outcome. Once the swelling has left and the mucous membranes are healed together, after about 6 weeks, then surgery carries a high degree of success with a high rate of fertility for those mares that are heathly.

In summary when these injuries occur they look far worse than they are and create concern on the owner or manager. Fortunately, these are not uncommon, are not life threatening and are amenable to surgical correction with full restoration of the perineal anatomy. Wind sucking can be controlled in most cases and, for the mare a high degree of fertility is restored.

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Retained Placenta

Jill A. Gogel, DVM student (class of 2002)

The condition known as “retained placenta” is one of the most common problems of post partum mares (2.5-10% of foalings). Mares normally pass the placenta by three hours post partum. If this has not occurred, retained placenta is diagnosed. Retained placentas occur most commonly after difficult foaling. Draft horses and older mares (over fifteen years old) are more prone to the condition than other horses. Retained placentas are considered emergency situations because there can be serious complications and a veterinarian should be consulted as soon as possible. If the placenta has been retained more than eight hours, bacterial numbers escalate to the point of overpowering the defense mechanisms of the uterus. This can lead to severe infection (metritis) with sequelae such as sepsis, toxaemia, and laminitis (founder). Treatment should begin at least within six hours after foaling. Goals of treatment are to remove the placenta atraumatically and to control uterine infection.

If any portion of the placenta protrudes from the vulva, it should be tied in a knot so that it hangs above the hooves. This reduces the chance of tearing the placenta and decreases contamination. Oxytocin (40-80 IU, intramuscularly or 10-20 IU, intravenously) can be given, starting three hours after foaling. Mares usually expel the placenta within 15-20 minutes after injection. If this does not occur, the injection can be repeated twice, at two-hour intervals. Another method involves using an IV drip of oxytocin (80-100 IU) in 1 L of saline over 30-40 minutes. Walking the mare for 5-10 minutes after administration results in expulsion of the membranes 75% of the time. This method seems to cause less violent abdominal discomfort than the first, and administration can be halted if the mare experiences excessive pain. If the methods above are not effective, infusion of the allantoic cavity can be attempted. The placenta must be intact for this to be effective. The cavity is filled with 10-12 L of clot, warm potassium iodide or saline solution. The objectives are to cause stretching of the uterus, which helps to disengage the placenta from the maternal crypts, and to trigger release of endogenous oxytocin, which results in uterine contraction. This procedure can be repeated if necessary. Manual removal of the placenta is not recommended due to the possibility of excessive hemorrhage and permanent endometrial damage. If the placenta is not expelled within the first six to twelve hours after parturition, or if the mare exhibits signs of systemic illness, systemic and intravasal broad-spectrum antimicrobial and systemic anti-inflammatory agents should be administered.

New treatment modalities for this condition have been researched in the past few years. In one study, intraplastral cloxacin treatment was studied as a possible treatment. Bacterial collagenase was found to be effective in breaking down the attachment between uterus and placenta. Ne e of necrosis or other damage to the uterus was found after use of the collagenase injection. In another report, propanolol, a beta blocker, was used to prevent retained placentas. In the normal uterus, beta-receptor activation results in inhibition of uterine motility. By blocking beta-receptors with propanolol, uterine motility increases. It was found that propanolol administration during the second stage of parturition resulted in shortening of foaling time and release of collagenase treatment was studied as a possible treatment. Bacterial collagenase was found to be effective in breaking down the attachment between uterus and placenta. Ne e of necrosis or other damage to the uterus was found after use of the collagenase injection. In another report, propanolol, a beta blocker, was used to prevent retained placentas. In the normal uterus, beta-receptor activation results in inhibition of uterine motility. By blocking beta-receptors with propanolol, uterine motility increases. It was found that propanolol administration during the second stage of parturition resulted in shortening of foaling time and release of collagenase. This increases the likelihood of treating mares that don’t need it. It could, however, be used as a preventative in mares which have had retained placentas in the past.

References:

**Common Complications**

**Evisceration** – Evisceration is a potentially fatal complication that can occur anytime from hours to several days following surgery. Evisceration occurs when loops of small intestine pass through the inguinal canal and enter the abdomen. Affected horses show signs of colic, fever, and poor appetite. Horses can be reluctant to move and develop diarrhea or weight loss. Treatment includes antibiotics, anti-inflammatory agents, and abdominal lavage. The best method of treatment is surgical ligation of the abdominal cavity.

**Hydrocele** – A hydrocele is a fluid-filled, painless swelling of the scrotum that can appear months following castration. Hydroceles develop when excessive amounts of the vaginal tunics surrounding the testicle and spermatic cord are left behind following castration. If the swelling is not a hindrance and does not increase in size, no treatment is necessary. Drainage of the fluid only temporarily reduces the swelling. Surgery is required for permanent resolution of hydroceles.

**Penile Paralysis** – Penile paralysis is a complication of castration. It can result from the use of phenothiazine (a type of tranquilizer), excessive edema or wound infection. Treatment includes manual replacement of the penis into the sheath, hydotherapy and massage to minimize edema, antibiotics, anti-inflammatory agents and protective skin creams.

Post-operative complications following open techniques of castration can never be completely eliminated. However, new and improved surgical techniques can virtually eliminate complications following surgery. The best method of limiting these complications is to have a surgical technique performed called scrotal ablation. The technique of scrotal ablation involves complete removal of the scrotum and ligation of the spermatic cord (eliminates excessive hemorrhage and prevents eversion). Once the testicles have been removed the surgical incision is naturally completely closed. Scrotal ablation virtually eliminates many of the complications previously described. This technique costs approximately twice as much as a regular castration with open incisions. But the lack of complications makes it worth the extra cost.

When traditional methods of castrations have been performed the risk for complications can be greatly minimized by vigilant observation by the owner and by following good management practices. These include activity restriction for 24 hours following surgery, forced activity from 24 hours post-operatively until the wound heals (20 minutes or 1 mile/day), hydrotherapy, providing clean surroundings and isolation from other horses to prevent vigorous activity. Your veterinarian will provide tautus immunization, and should stretch the incision to provide adequate drainage. Despite excellent surgical technique and conscientious post-operative care by the owner, complications with open techniques of castration can still occur with the potential for catastrophic consequences. You should contact your veterinarian immediately if you notice any problems, so that treatment can begin as soon as possible.

**References**


Untying Tying Up
Michelle Zachry, DVM Student (class of 2002)

Equine Cushing’s Disease
Jenly Kelly, DVM Student (class of 2002)

Cushing’s disease in horses is a disease of aging. It is caused by a benign tumor affecting a part of the brain known as the pituitary gland. The exact reason for the formation of the tumor is unknown. The tumor, a pituitary adenoma, interferes with the body’s normal hormonal balance due to the space it occupies in the brain as well as an overproduction of hormones and peptides.

Advances in veterinary medicine, nutrition, and farm technology have allowed horse owners to enjoy their horses for much longer than in the past. The increase in the geriatric population of horses is paralleled with an increase in the number of horses showing clinical signs of Cushing’s disease. The average age of horses diagnosed with Cushing’s is 12 years old, with a range from 10 to 35 years of age. It has been reported in horses as young as 7 years old.

The most common clinical signs of Cushing’s is an excessive long hair coat, which often fails to shed out in the warmer months. Other clinical signs include weight loss, lethargy or poor performance, laminitis, increased water intake and urination, increased sweating, andmares may fail to cycle. The onset of these clinical signs is usually gradual over a year or more, but can also develop rapidly.

The tumor’s location interferes with normal hormone secretion, which in turn leads to changes manifested through the clinical signs as well as secondary complications. The major complications of Cushing’s include diabetes mellitus and a decreased immune system, which predisposes horses to secondary infections. Veterinarians can diagnose Cushing’s disease through laboratory blood work and with special tests (deamino-vasopressin suppression test, plasma ACTH concentration) that evaluate the levels of hormones affected by the tumor.

There is no cure for Cushing’s disease, but the good news is that there are medications available which usually improve the clinical signs. Improvement of clinical signs will most often improve the quality and length of life for your horse. Some of the medications used to treat horses with Cushing’s include pergolide, bromocriptine, and cyproheptadine. These drugs help to balance your horse’s hormones by reducing the secretion of cortisol and other hormones responsible for the clinical signs and changes seen with Cushing’s disease. An important part of therapy is also proper management practices such as clipping the long hair coat during warmer months, corrective hoof trimming and shoeing for horses suffering from chronic laminitis, regular deworming and vaccinations, and aggressive treatment of wounds or infections as soon as they are detected. Some horses have been managed successfully for more than 10 years after being diagnosed with Cushing’s disease.

Equine Strangles and Vaccine Considerations
Lee Wingett, DVM Student (class of 2002)

Strangles, also known as Equine Distemper or Barb Fever, is a highly infectious disease in horses caused by Streptococcus equi bacteria. It usually affects young horses and horses in high-density management systems (e.g. breeding farms). However, horses of any age and under any type of management can be affected. The S. equi is transmitted directly from contact with infected or asymptomatic carrier horses. It can also be transmitted via contaminated water troughs, feed buckets, stalls, trailers, etc. The organisms can survive for weeks in water troughs but dies quickly in soil. Direct sunlight and disinfectants also kill the bacteria.

After a horse inhales or ingests the organism, it migrates to local lymph nodes and multiplies. Within 3 to 14 days of exposure, the horse may exhibit fever, sore throat, and purulent nasal discharge. The S. equi infection spreads to lymph nodes, acute swelling and abscess formation develop around the horse’s throat or upper neck region. If the lymph node enlargement becomes severe, there is a risk of partial or complete upper airway obstruction. This is how the disease became known as “strangles.” Eventually, the enlarged lymph nodes can rupture onto the skin resulting in pus-filled draining tracts or into guttural pouches resulting in purulent nasal discharge. Abscessed lymph nodes rupture 7-14 days after initial clinical signs are seen.

Procaine penicillin G is the treatment of choice, however initiation of antibiotic therapy should be considered cautiously. Treatment of horses with established disease (i.e. lymph node abscesses) provides only temporary improvement and usually clinical signs recur shortly after antibiotics are discontinued. Alternately, early antibiotic treatment within 24 hours of the onset of fever often stops the infection. However, elimination of the infection with antibiotics decreases the horse’s ability to develop proper immunity against S. equi and the likelihood of reinfection upon subsequent exposure is increased. Antibiotics are indicated in horses exhibiting severe complications such as respiratory difficulty, prolonged high fever and loss of appetite, and purpura hemorrhagica. It is preferable to let the disease run its course in uncomplicated strangles cases because most horses become protected from the infection for at least 4 years after a natural infection. Hot packing therapy will promote maturation of abscessed lymph nodes and after the abscess ruptures it should be flushed with diluted antiseptic solution (e.g. povidone iodine).

The decision to vaccinate a horse against strangles and the type of vaccine to be used should be discussed with a veterinarian. Vaccination is usually reserved for horses expected to be at high risk for exposure (farms with heavy horse populations, facilities with current or recent outbreaks, etc.).

Intramuscular S. equi bacterin and subunit (M-protein) vaccines are approved for use in the United States. These have been shown to generate a weak immune response in the horse’s airways, which is a primary route of S. equi infection. However, systemic antibiotic response is sufficient enough to attenuate the severity and duration of clinical signs as well as reduce the attack rate during outbreaks by an estimated 50%. Adverse reactions to intramuscular streptococcal vaccines include injection site swelling and abscess formation. In rare cases, a serious vascular inflammation called purpura hemorrhagica can also develop days to weeks after injection. It manifests as edema (swelling) and possible small hemorrhaging (ecchymoses) of mucosal membranes. The disease is potentially life-threatening.

Intranasal (modified-live bacterial) vaccines are also approved for use in the United States. They tend to have fewer vaccine site reactions and do result in higher production of systemic IgA antibody for enhanced airway immunity. They are not suggested for use in foals younger than 4 months of age because these foals have decreased ability to produce IgA and will not fully benefit from the vaccination.

The intranasal vaccine is safe to use in pregnant mares. Therefore, some passive protection can be expected up to 4 months for foals born from vaccinated mares.

Intramuscular streptococcal strains vaccine begins with an initial series of 2-3 doses at intervals of 2-4 weeks, then annually or before anticipated exposure. Intranasal vaccination starts 4-6 months of age for reasons described above. Vaccines may be administered during a strangles outbreak to try to bring the outbreak under control. However, vaccinating clinically ill horses is not recommended.

Proper management practices to control the spread of the organism should also be utilized to help minimize the spread of the disease during outbreaks of strangles.

References:
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