**How to Provide Obstetrical Intervention in Equine Ambulatory Practice**

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1. Introduction

The reported incidence of dystocia in mares is 1% to 4%. Most equine dystocias are attributed to abnormalities in fetal presentation, position, and posture, with postural abnormalities being the major contributor, caused by long fetal extremities. Fetal oversize appears to be rare in horses. Maternal contribution to equine dystocia, such as occurs with defects in the abdominal wall, occasionally occurs.1–8

To be able to successfully intervene in equine dystocia in a farm setting first requires an adequate understanding of normal parturition and knowledge of the causes of dystocia. The ambulatory clinician must accurately diagnose contributing fetal and/or maternal abnormalities to properly formulate a therapeutic plan. Judgment and experience are paramount in performing obstetrical procedures so that injury to the dam and/or fetus can be avoided if at all possible, and the mare’s subsequent fertility can therefore be maintained.

Parturition is typically divided into three characteristic stages: Stage 1, the preparatory phase, usually lasts 30 minutes to 4 hours. During this stage, the fetus rotates into dorsosacral position and uterine contractions force the foal and surrounding placenta into the dilating cervix. Because of discomfort expressed during this stage (particularly in maiden mares), some owners or foaling attendants will expect that dystocia is present and thus call the veterinarian. Stage 2, the most active stage of parturition, involves passage of the foal through the birth canal and usually requires only 20 to 30 minutes after rupture of the chorioallantois. This phase begins with fetal passage into the birth canal, is accompanied by vigorous abdominal straining and rupture of the chorioallantois, and ends with delivery of the foal. In some cases, the chorioallantois may not rupture as the fetal extremities are forced through the cervix, resulting in protrusion of the unruptured chorionic (“red bag”) surface through the vulvar lips. Because this “red bag” condition is accompanied by separation of the placenta, it should be manually ruptured or cut immediately by the foaling attendant to avoid fetal asphyxia.

If either the first or second stage of parturition is prolonged, or if fetal delivery is not progressing as expected, dystocia should be suspected and the veterinarian should be called for assistance. Prompt
resolution is necessary to save the foal and mare. For a more thorough discussion of fetal and maternal changes occurring during parturition and abnormalities contributing to dystocia, the reader is referred to Frazer.8

2. Management of the Mare Until the Veterinarian Arrives

Management of the mare until the veterinarian arrives on the farm can be important to avoid excessive loss of lubricative fluids, fetal distress, and impaction of the fetus into the birth canal that is so extensive that it prevents fetal manipulation to resolve dystocia. Walking the mare on lead, attempting to keep her moving forward without straining or lying down, may be sufficient if the veterinarian can arrive within a short period of time. Sedation of the mare to stop straining should be avoided if possible, as sedatives administered to the mare may adversely affect the fetus. If not already done, wrapping the mare’s tail, preparing a clean, well-bedded stall, and filling a clean bucket with warm tap water and cotton in preparation for arrival of the veterinarian can save valuable time. A lip-twitch should be made readily available. Having a foaling kit already assembled and ready to use, either on-farm or with the ambulatory vehicle, can also be indispensable.

3. Examination of the Mare on Arrival

Prompt examination of the birth canal and fetus is indicated when dystocia is suspected. The equine placenta separates rapidly from the endometrium during parturition, thereby depriving the fetus of oxygen if it is not promptly delivered after the onset of second-stage labor. Early intervention maximizes the chances of delivery of a viable foal with no injury incurred by the dam.1–4 High-quality obstetrical equipment, kept clean and sterilized or disinfected between uses, should be readily available for obstetrical intervention. Minimal equipment should include materials necessary to cleanse the hindquarters of the mare, obstetrical chains or straps with handles, sleeves, and lubricant. If the practitioner is comfortable with performing fetotomy, appropriate equipment should be used (the reader is referred to Frazer7,8 for description of fetotomy equipment and use). A clean bucket, cotton, tail wrap, and disinfectant soap are used to clean and prepare the mare’s hindquarters and perineal area for examination. Proper lubrication is required to protect the genital tract during manipulative procedures. Water-based lubricants, such as carboxymethylcellulose solutions, are generally adequate. Good protection is provided to the fetus and genital tract with such lubricants, and large volumes can be pumped into the uterine lumen and around the fetus through a sterile stomach tube when necessary.5–8 If the birth canal is swollen and irritated, petrolatum jelly can be applied to protect the genital tract. If the obstetrician anticipates that a cesarean section will be necessary, petrolatum jelly should be avoided because it is not water-soluble, and, if spilled into the abdominal cavity, can induce peritonitis.5

The mare should be standing in a clean area with good footing during the initial examination. Slowly walking the mare during the examination is usually sufficient to control straining. Alternatively, the mare can be placed in a stock for examination, but the stock should be kept open behind in case the mare attempts to lie down.7,8 Restraint should be the minimum required to protect both the clinician and mare from injury. The simple use of a lip twitch, with alternate tightening and loosening, will often be sufficient to help control straining by the mare during vaginal examination. Light caudal epidural anesthesia (1 to 1.25 cc of 2% lidocaine/100 kg body weight; or a combination of 0.4 cc xylazine, 2.6 cc 2% lidocaine, and 3 cc sterile saline solution per 500 kg) may occasionally be necessary to minimize straining and facilitate examination of the fetus and birth canal.2,4,5 Again, sedation is avoided whenever possible because of associated depression to fetal respiratory and cardiac function. If sedation is necessary, intravenous injection of 0.07 mg/kg acepromazine maleate, or an initial intravenous injection of 0.44 mg/kg xylazine followed in 4 to 8 minutes by intravenous injection of 0.044 mg/kg butorphanol tartrate, will usually reduce straining and provide more pronounced sedation and analgesia.5 In cases in which the farm is distant from a referral center, or the mare owner chooses not to send the mare to a referral center, general anesthesia can be induced and the mare’s hindquarters elevated to provide adequate room for controlled vaginal delivery.9 The decision to use general anesthesia is not taken lightly because recovery from anesthesia and transport to a referral hospital could be complicated and time-consuming if the fetus is not delivered.

Strict sanitation and effective lubrication should always be maintained whenever the genital tract is invaded. The obstetrician’s hands and arms should be scrubbed with a disinfectant soap before examination. The fetus and birth canal are thoroughly examined for evidence of previous trauma and the viability, and presentation, position, and posture of the fetus are then determined. The fetus is also evaluated for deformities (contractures, hydrocephalus, etc.), and the amount of room available for manipulation and delivery is assessed.1–8

4. Obstetrical Operations

Mutation of abnormal presentation, position, and posture of the fetus, followed by delivery with traction, is the most common method of relieving dystocia in mares. To permit passage of a fully developed fetus, the extremities must be extended. To accomplish mutation, it is helpful to first repel the fetus from the maternal pelvis into the uterus, where more space is available for manipulation to
correct fetal malposture or malposition. Such maneuvers are sometimes facilitated by first pumping 4 to 8 L of lubricant (e.g., rectal lubricant mixed with an equal volume of warm water) into the uterine lumen and around the fetus. An alternate form of delivery should immediately be selected if the uterus is devoid of fetal fluids and contracted tightly around the fetus because repulsion in such cases is likely to result in uterine rupture.5

Before correcting a limb maldisposition, Frazer8 recommends placing a rope snare around the poll of the fetus and through the mouth, in case the expulsive efforts of the mare or movement of the fetus results in the head being turned downward or toward the side—thus providing the obstetrician with a method for returning the head to the birth canal. To correct flexion of an extremity when operative space is limited, the proximal end should be repelled while the middle portion is rotated laterally. Traction can then be applied to the distal end of the extremity, either by hand or by traction on a chain or strap placed around the pastern, until the limb is fully extended. This reduces the longitudinal arc the foot must go through in the birth canal, effectively increasing the room for limb extension. Extreme care should be taken to protect the genital tract from injury when applying traction on the distal end of a flexed extremity while straightening the limb to avoid uterine rupture. To correct lateral or ventral head posture, the fetal limbs and/or body are repelled while the muzzle or jaw is grasped and pulled toward the pelvic inlet. It is sometimes easier to correct abnormal head and neck posture with one of the forelimbs flexed at the carpus, giving more space than that offered when the forelimbs are extended. Again, it can be helpful in such cases to first place a loop of an obstetrical chain or strap around the pastern, even though the limb is left in a flexed position while the head and neck are brought into the birth canal—thus ensuring the flexed limb can be reached and brought into the birth canal in turn. Once the foal is returned to normal presentation, position, and posture, and the birth canal is adequately lubricated, extractive force can be applied (by hands grasping the forelegs, or with handles attached to obstetrical chains/straps properly applied to the forelimbs). When applying extractive force, one forelimb should slightly precede the other, ensuring that the fetal shoulders traverse the pelvic inlet at an angle taking maximum advantage of the space available in the birth canal. For more complete description of fetal manipulations including posterior presentations, proper application of obstetrical chains or straps, proper use of extractive force, or proper handling of maternal contribution to dystocia, the reader is referred to recent reviews by Frazer.7,8 Briefly, traction should only be applied during the mare’s abdominal press if possible. If delivery does not progress rapidly once traction is applied, the obstetrician should examine the birth canal to ensure that a flexed hind limb is not situated between the fetal body and the maternal pelvis.

5. Decisions to Refer the Dystocia to a Hospital

Although there are no hard and fast guidelines on when to decide that a mare should be sent to a referral hospital for resolution of dystocia, the obstetrician should have a plan in mind for doing so. Certainly, if the foal is impacted into the birth canal and cannot be safely repelled, an alternate form of delivery (e.g., controlled vaginal delivery under general anesthesia, cesarean section) will be required.9 If obstetrical manipulations do not result in steady progress toward correction of maldisposition and delivery, or if traction of the fetus once maldisposition is corrected does not result in progression through the birth canal, an alternate approach is indicated to achieve satisfactory resolution. Byron et al.10 found that foals surviving delivery at a referral hospital were delivered in a median time of 60 minutes after the mare with dystocia had entered into second stage labor (after rupture of chorioallantois), whereas foals not surviving the ordeal were delivered in a median time of 79 minutes after the mare with dystocia had entered into second stage labor. Time and transport stress also influences mare survival, particularly when repeated trauma to the genital tract occurs with persistent unsuccessful attempts at delivery.8 Although arrival at a referral hospital within a short period of time may not be possible for many mares serviced by rural ambulatory practitioners, the short amount of time that mares and foals typically survive dystocia makes timely referral a requirement when possible. Therefore, one of us (J.P.M.) typically allows himself 15 to 20 minutes of manipulative time to make steady progress in resolving a dystocia; if progress is not being made in that amount of time, he prefers to send the mare to a referral hospital. Finally, the only time lost in having transportation readied for hauling the mare to a hospital (i.e., truck and trailer hooked up and ready to be loaded) before the ambulatory practitioner arrives at the farm is that required to unhook the trailer if the practitioner is able to successfully deliver the foal.

Recommendations can be made regarding preparing the mare for transport to a referral hospital. Heroic efforts, such as intubating and providing respiratory support to a foal that is “stuck in the birth canal,” have been advocated to improve the chances of a foal surviving the transport and delivery at a referral hospital. In countries where injectable clenbuterol or isoxsuprine are available to the equine practitioner, systemic administration before transport may be of benefit in controlling uterine contractions and thus reduce placental separation and fetal hypoxia. One of the authors (T.L.B.) has found this to be of clinical benefit and yet not result in postparturient problems (e.g., uterine prolapse, retained placenta). However, these injectable tocolytics are not available to U.S. practitioners. Al-
though the effects of oral administration of clenbuterol are not known, one of the authors (T.L.B.) routinely recommends its use to referring practitioners who must send a mare in dystocia on a long trip to a referral hospital. We do not usually recommend administration of caudal epidural anesthetics in a mare soon to be transported because of the danger that the mare may fall; however, we also realize that many mares have survived transport in a standing position after a light caudal epidural anesthetic was previously administered in an attempt to deliver a foal at the farm. Systemic antimicrobials and flunixin meglumine administration immediately before transport may be of benefit in reducing potential after-effects of the dystocia on the mare.

References