Use of Transcutaneous Ultrasonography in Complicated Latter-Middle to Late Gestation Pregnancies in the Mare: 122 Cases

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Transcutaneous ultrasound is useful in the diagnosis, management, and prognosis in mares with complicated pregnancies. Although normal and abnormal ultrasound findings were fairly well correlated with the ultimate survivability of the foal, the practitioner should be aware that in our experience thus far, over 15% of the time ultrasound findings will not be predictive of foal survivability. Author’s address: Rood and Riddle Equine Hospital, 2150 Georgetown Rd., P. O. Box 12070, Lexington, KY 40580. © 1997 AAEP.

1. Introduction
Transcutaneous ultrasonography of the equine fetus and its use in evaluating fetal well-being have been described.1–5 The purpose of this paper is to share with the practitioner ultrasonographically visible abnormalities of the placenta, uterine fluids, umbilical cord, and fetus that were discovered in mares with complicated pregnancies in our practice. The normal structures of the late gestation pregnancy are also illustrated. This paper further provides an analysis of the value of the detection of abnormalities found on ultrasound and the relationship to foal survivability in 122 mares with complicated pregnancies.

2. Materials and Methods
Records of mares in middle to late gestation (7 months gestation or greater) that underwent transcutaneous ultrasonographic examination of the uterus because of complications during pregnancy were reviewed. Transducer frequencies used in the studies ranged from 5.0 to 2.5 MHz for evaluation of the fetus and uterine fluids, and from 7.5 to 5.0 for evaluation of the uterus and placenta. The ultrasound results were considered abnormal if there was a visible anomaly of the fetus, large areas of retroplacental fluid accumulation, placental thickening, visible abnormalities of the umbilical cord, or unequivocally excessive or reduced allantoic or amniotic fluid quantities. Interpretations of fetal heart rate and fetal activity were made on a subjective as well as objective basis. A complete lack of activity on repeat examinations was considered abnormal, yet abrupt markedly excessive activity was also considered abnormal. A quiet fetus in a near-term pregnancy with a resting heart rate of 100 or more, or a fetus with a heart rate less than 50 was considered abnormal based on previously reported data.1–5 An interpretation of fetal heart rate at 10 months gestation or less was difficult because of the lack of published information on pregnancies at this stage; however it was considered abnormal if the
heart rate was less than 80/min. Fetal size was only taken into consideration in two cases, in which the overall size of the fetus was unequivocally grossly abnormal. Fetal aortic root diameters were measured but were not used in the interpretation because of inherent bias based on gestational age, and equivocal experience by us in the value of this measurement.

3. Results

One hundred twenty-two mares with complicated pregnancies underwent transcutaneous ultrasonographic evaluation in our practice over a 5-year period. Reasons for the ultrasound examination included premature lactation or udder development, vaginal discharge, history of still-born foals, prolonged gestation, recently corrected uterine torsion, excessive abdominal size, apparent abdominal pain suspected to be reproductive in origin, severe systemic illness, or signs of hemorrhage. Three mares died before foaling. These cases are excluded from further analysis.

Sixty-one percent (n = 73) of the ultrasound examinations were considered to be normal. Seventy-nine percent (n = 58) of pregnancies with normal ultrasound examinations were associated with a normal foal, although four foals were born 2 to 2½ weeks early but were otherwise healthy. Sixteen percent (n = 12) of foals resulting from pregnancies with a normal ultrasound were stillborn, died, or were euthanized within 48 h. However, three of these foals were a result of dystocia, four foals were delivered by cesarian section because of ultimately fatal diseases of the mare, and one foal was euthanized at birth because of the absence of a forefoot. Foals were born prematurely and required hospitalization but survived in the remaining pregnancies (n = 3 or 4%) with a normal ultrasound examination. Of eighteen mares that were overdue by 2 or more weeks, seventeen had normal ultrasound examinations and normal foals.

Results of 39% (n = 46) of the ultrasound examinations were considered to be abnormal. Abnormal findings included obviously thickened placenta, echogenic retroplacental fluid resulting in placental separation (found to be mucoid material, pus, or hemorrhage at parturition), hydrallantois or hydramnios (nine cases, three accompanied by fetal death), markedly reduced amounts of allantoic or amniotic fluid (two cases, discovered in mares with severe systemic illness), fetal death, breech position at 10 months gestation, twin pregnancy, fetal ascites, and omphalocele. Inappropriately slow or elevated heart rates were also discovered in some cases. Two fetuses had cardiac arrhythmias: One had a bradycardia and was delivered prematurely because of herpesvirus; the other had an erratic rhythm with normal rate (determined to be transient atrial fibrillation at an uneventful birth). Two fetuses appeared to have sudden bouts of abnormally excessive activity, characterized by apparently violent activity, with periods of abrupt cessation. Both foals died. Inactivity was observed in four fetuses; two died, and one survived but required hospitalization. The fourth foal was completely inactive on several ultrasound examinations, yet at birth was very active and healthy. An unequivocally remarkably small fetus was found in one mare through the 14 month of gestation. Parturition was induced; the resulting foal weighed 35 pounds and appeared relatively healthy, but was discovered to have hydrocephalus and euthanized.

Three mares had previously undiagnosed twins (one or both dead), and fetal death in a singleton pregnancy was discovered in seven mares. Excluding these ten cases, abnormalities found on ultrasound were associated with either a nonviable foal (19 of 36 or 53%) or a foal that ultimately survived but required hospitalization at birth (10 of 35 or 29%). Nineteen percent (seven of 36) of abnormal ultrasound examinations were associated with normal healthy foals. Peritonitis, hemoperitoneum, and hemorrhage into the broad ligament were discovered in three mares during the evaluation of the fetus.

4. Discussion

Transcutaneous ultrasound yielded valuable information in mares in the latter portion of gestation. Thickened placentas or retroplacental fluid were seen in some cases. In mares with ascending placitits, it is important to evaluate the uterus from the inguinal region. Transrectal ultrasound enables evaluation of the dorsal portion of the placenta, as well as the cervical region. This is not routinely performed in such cases in our practice but certainly may provide important additional information, particularly in mares suspected of having ascending placitits. Decisions on antibiotic treatment and whether and when to induce parturition are based on clinical signs in the mare, stage of gestation, and a subjective as well as objective assessment of the condition of the fetus. Ultrasound was of particular use in the two fetuses with visible anomalies and hydramnios. The fetal diameter was grossly widened as a result of ascites in one case; knowledge of this dictated the most appropriate management of the case. In the other near-term fetus with omphalocele, parturition was induced in the hospital and the foal taken to surgery upon delivery to replace the extra-abdominal intestines, and the foal recovered uneventfully.

The practitioner should be aware that with the exception of detecting a breech or transverse position, or excessively large fetal diameter as in the fetus of this report with ascites, there does not appear to be predictability for dystocia with ultrasound. In conclusion, transcutaneous ultrasound is
valuable in the diagnosis, management, and prognosis of mares with complicated pregnancies.

References