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Cesarean section is performed in approximately 15-25% of mares admitted to equine referral hospitals (Byron et al. 2003; Freeman et al. 1999). It may also be performed as an emergency procedure in mares with laminitis, endotoxemia, colic peritonitis or uterine torsion or as an elective procedure in mares with anatomical abnormalities affecting the caudal reproductive tract. A number of complications can occur following and related to c-sections. These complications and trauma to the caudal reproductive tract occurring before C-section can adversely affect a mare’s health and her future fertility. Fertility data on mares post C-section is limited. This manuscript will discuss a retrospective study conducted at Rood and Riddle Equine Hospital on the effects of c-section on survival rates of mares, post-operative complications and fertility in the three years following C-section.

Ninety seven mares were included in the study. Produce records after C-section were compared to cumulative foaling rate before C-section. Cumulative foaling rate before C-section was determined by evaluating foaling records obtained from The Jockey Club on 81 Thoroughbred mares and United States Trotting Association on 5 Standardbred mares. Records from 67 of the 86 mares were used in the analysis as 19 of the Thoroughbred mares were primiparous. The cumulative foaling rate was defined as the number of foals born at term divided by the number of mares bred in a year. Barren years and abortions were included in the number of matings. Years marked as “no report received” by the Jockey Club were excluded from the analysis. Complications encountered in mares included all medical or surgical problems that arose after delivery during hospital stay. Cases were divided into three groups: dystocia (group 1), C-section performed because maternal disease compromised the fetus (group 2), and elective C-section (group 3). The dystocia group was further divided into three periods according to the length of time from rupture of the chorioallantois to delivery of the foal: < 90 minutes, ≥ 90 minutes, or time unknown. Controlled vaginal delivery (under anesthesia) was attempted in all dystocia mares upon arrival to the hospital. A C-section was performed if the foal could not be delivered in 15 minutes or sooner, if, in the judgment of the surgeon, a C-section would be necessary.

C-section was performed for dystocia that was not resolved by controlled vaginal delivery (n=71), maternal disease (n=20) and as an elective procedure (n=6). Overall mare survival rate was 84.5% (82/97). Foal survival to discharge was 36% (29/80). Seventeen of 71 (24%) dystocia mares had a partial fetotomy before C-section and six (35%) did not survive. Congenital fetal deformities (23/71, 32%) was the most common cause of dystocia. Breeding the same year as C-section, prolonged dystocia and mare age had a negative effect on subsequent foaling rate (p < 0.05). Cumulative foaling rate before C-section was 77.6%. Mean foaling rate for the three years after C-section was 51% when time from rupture of the chorioallantois to delivery was > 90 minutes, 73% when it was < 90 min-

utes and 31% for mares ≥ 16 years of age. Fifty-four (66%) surviving mares experienced post partum complications with retained fetal membranes being most common. Mares in dystocia for < 90 minutes had the fewest complications (p < 0.03).

Data indicate that foaling rates after C-section can be similar to rates before C-section if the mare was in dystocia < 90 minutes, if the C-section was an elective procedure or if the mare required a C-section because of maternal disease. However, fertility after C-section was reduced significantly if the mare was in dystocia for > 90 minutes (51%), if she was bred the same year as the C-section (40.5% versus 77.6%-cumulative foaling rate), if a partial fetotomy was performed (0% year one; Mean of 46.5% years 2 and 3) or if she was ≥ 16 years of age (31%). These differences suggest that the adverse effect on fertility following dystocia resolved by C-section results from more than the direct effect of the C-section. Stretching and damage of tissues in the reproductive tract resulting in loss of integrity of vulvar, vestibular and vaginal barriers against contamination, delayed uterine involution, metritis, cervical trauma or uterine degeneration, all possible and common aftermaths of prolonged dystocia, could contribute to the decreased fertility. Others have shown that prolonged attempts at vaginal delivery of foals is associated with multiple complications, vaginal trauma, septic metritis, high mare mortality and decreased foaling rates in subsequent years (Freeman et al. 1999; Juzwiak et al. 1990). Overall mare survival was similar to other reports (84.5%) (Byron et al. 2003; Freeman et al. 1999; Juzwiak et al. 1990; Maaskant et al. 2010). Prolonged dystocia, especially if a partial fetotomy was performed before C-section was associated with the highest mortality rate. Partial fetotomy is a safe method of correcting a dystocia if the fetus is nonviable, the cervix is dilated and there is minimal swelling of vaginal tissues. The procedure does not impair short-term fertility if it is performed by a veterinarian skilled in the technique (Carluccio et al. 2007; Frazer 2001; Nimmo et al. 2007; Vandeplasseche 1980). Our data, however, indicate that if the fetotomy is not successful and the procedure is prolonged, the mare is at risk for severe complications including death after C-section. Retained fetal membranes was the most common complication. Mares in dystocia < 90 minutes had fewer complications than mares in other groups (37.5% versus 64-83%). Retained fetal membranes were more common in mares undergoing C-section because of maternal disease or as an elective procedure than in mares experiencing dystocia. This may occur because the C-section is performed before first stage labor when the choioallantois is still tightly attached to the endometrium. Mares that retain fetal membranes must be monitored closely and treated appropriately to prevent the possible sequela of metritis and lamination.

In conclusion, mare age, duration of dystocia and whether a partial fetotomy was performed before C-section should be considered when advising clients on mare survival and future fertility after C-section.

REFERENCES


