Cesarean section in camels (Camelus dromedarius): complications and post-surgical fertility
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Little information is available on cesarean section in camels. The objectives of this retrospective study were to evaluate the indications for cesarean section, survival rate of dams and calves, and postoperative complications and fertility.

Seventy-six cases were included. Surgery was performed with the female restrained in sternal recumbency using a left flank approach. Sedation was obtained with xylazine (0.25 mg/kg, IV) alone or in combination with butorphanol (0.05 mg/kg IV). Local analgesia was provided with an inverted L block using lidocaine. Caudal epidural analgesia with lidocaine was performed on only six animals. Females were multiparous and either bred naturally (n=11) or had received an embryo at eight days post-ovulation (n=65). The mean ± SEM gestational age at presentation was 374.1 ± 1.4 days (range 352-398) for embryo transfer recipients and 376.1 ± 6.2 days (range= 278-393) for naturally mated females. The time from observation of the second stage of labor to surgery was less than six hours for embryo transfer recipients and between eight and 48 hours in naturally mated females. Failure of cervical dilation was the most common indication for cesarean section (81.6%; n=62). Other causes included uterine torsion (0.5%; n=3), fetal lateral head and neck deviation (0.5%; n=3) and one case each of bilateral carpal flexure, fetotomy complication, fetal emphysema, bilateral hip flexure and vaginal evisceration. All females with failure of cervical dilation were part of a study on embryo recipients where pregnancy was maintained by daily progesterone injection until two weeks prior to the due date.

Overall dam survival rate was 92.1% (n= 70). Cause of death included peritonitis (n=3), septic metritis (n=2) and one euthanasia due to vaginal evisceration. The most common non-lethal postsurgical complications were surgical site infection or dehiscence (mostly due to myiasis; 20%) and retained placenta (15.7%). Calf viability at delivery, after one week of life and at weaning was 81.6%, 75% and 73.7%, respectively. Complete placental separation was present in all cases where the calf was delivered dead or died within 15 minutes after surgery. Causes of death in the first week included sepsis (n=2), encephalopathy (n=2) and trauma (n=1). Forty-eight females were used as recipients in an embryo transfer program one year after surgery. Of these, 70.8% (34/48) became pregnant following one to three embryo transfers.

This study shows that survival of the dam and calf are excellent for field cesarean section in camels if intervention is early. Complications due to incision site dehiscence were reduced with administration of local and systemic ivermectin treatment. The high rate of failure of cervical dilation in this case series may have been due to maintenance of pregnancy with exogenous progesterone.

Keywords: Embryo transfer, dystocia, surgery, neonate