

Surgical management of dystocia due to dicephalus foetus in a non-descript cow

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Abstract

A non-descript cow in the second gestation was presented with a history of unproductive, continuous straining for more than 12 hours. Per vaginal examination revealed a foetus with a double head attached to a single torso. After stabilising the animal, a caesarean section was performed under local anaesthetic to deliver the dead dicephalus foetal monster. Post-operatively, the animal was prescribed parental antibiotics, supportive therapy and regular antiseptic dressing. Following post-operative management and nutritional care, the animal recovered uneventfully and conceived in its 2nd post-operative oestrus.

Key words: Caesarean, Dicephalus foetal monster, Foetal monster, Non-descript cow

Highlights

- Caesarean section seems to be the best option in dystocia due to dicephalus foetus in cattle.
- Appropriate surgical intervention, post-operative care, and nutritional management could bring an uneventful recovery and conservation of reproductive health even after the caesarean section of a dairy cow under field conditions.

Dicephalus (two separate heads), often known as dicephalus diprosopus (two faces), is a state of embryonic duplication which involves the head with or without the involvement of the neck (Otonari *et al.*, 1993; Megahed, 2018). Dicephalus is a rare congenital defect with its occurrence in approximately one in one lakh bovines as per Hancock (1954). This type of anomaly is rare and caused due to abnormal separation of two primitive streaks in the embryonic phase resulting in conjoined twins (McGirr *et al.*, 1987). Conjoined twins may be due to genetical and environmental factors, and are monozygotic in origin. Delivery of dicephalus foetal monster can be resolved through fetotomy or caesarean section, but caesarean section is performed because severely overgrown and emphysematous monstrosities are very difficult to treat via fetotomy as

reported by Purohit *et al.* (2012). Similar work published by Lakshmishree *et al.* (2019) stated that pathological foetal conditions like conjoined twins often indicate that performing a caesarean section in cattle and fetotomy is not always a viable option. Caesarean section in cattle may lead to long-term complications like downer cow, debilitating condition, loss in production, increased calving intervals, increased services per conception, abortions and infertility. Study conducted by Cattell and Dobson (1990) found that 30% of the cows had poor appetite, fever, metritis, or diarrhoea after caesarean. Rougoor *et al.* (1994) stated that cost involvement in the caesarean operation, high culling rate, extended calving interval, extra treatments etc., often make caesarean in dairy cattle to be considered undesirable. So, the present case study deals not only with the caesarean section (C-section) and post-

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operative management but also with a follow-up to the first conception after the surgery under field conditions.

A five-year-old cow in its 2nd parity was attended with a history of inappetence and inability to deliver foetus despite frequent straining. As reported by the owner, the water bag ruptured approximately 12 hours back, and the cattle made frequent futile attempts to deliver the foetus. Upon per-vaginal examination, the cervix was found to be fully opened. The foetus had two heads with distinct palpable oral cavities and a single neck. No movement and reflexes could be felt during the examination. Considering the condition of the animal and foetal anatomy, it was decided to perform a caesarean section at the earliest for providing relief to the dam.

Preoperatively the animal was given dextrose normal saline (5% DNS) (1.5 litre through I/V route) to improve the health status. Isoflupredone acetate (5 mL through I/M route SOS or saviour drug) and another 2.5 L of DNS were provided during the surgical procedure. With the onset of unproductive straining and rupture of the water bag, the cow was totally off-fed. The skin fold test revealed moderate i.e., 8 -10% dehydration (retention of skin fold was for 2 to 4 seconds). So considerable amount of fluid was administered intravenously to improve the health status and correct the dehydrated condition of the dam as well as to minimize chances of hypovolemic shock during surgery. Due to the debilitated condition of the cow, the caesarean was performed in the farmer's house in right lateral recumbency by lateral approach under the combination of paravertebral nerve block and local infiltration. As per Whitlock *et al.* (2008), caesarean section is often considered obstetrical management of conjoined twins, and similar observations have also been reported by Ahmed *et al.* (2015) in non-descript caprine. Local infiltration of 2% lignocaine hydrochloride (20 mL) solution along the site of incision was carried out after paravertebral nerve block between L₁ and L₂. The current surgery required a significant amount of time in the field condition, and a

combination of local infiltration and regional nerve block was performed, as reported by Gupta *et al.* (2020) and Okur (2021). The incision site was prepared aseptically using 10% povidone iodine solutions following standard protocol. C-section was approached with a low oblique incision in the left flank area similar to Gupta *et al.* (2020). Left oblique celiotomy has various inherent advantages including fewer chances of contamination and herniation as reported by Adugna *et al.* (2022).

Following that, the gravid uterus was exposed outside of the abdominal cavity taking aseptic precautionary measures to avoid peritoneal infection. An incision was made on the body of the uterus to deliver the dead dicephalus foetal monster (Fig. 1). Following removal of the foetus and debris, the uterus was closed by a double layer of Lembert sutures using chromic catgut No. 3, after flushing of the uterine wall with luke-warm sterile water of potassium permanganate solution (1%) and then flushing with metronidazole and gentamicin sulphate solution to prevent sepsis. Potassium permanganate solution has been used in washing the uterine body as mentioned by Gupta *et al.* (2018) and Paul *et al.* (2017). The abdominal surgical incision was closed as per standard procedure maintaining all aseptic measures and time-to-time flushing with an antibacterial solution (metronidazole and gentamicin sulphate solution).

Following the closure of the surgical wound, the dam weighing approximately 300 kg was treated with injection of ceftriaxone and tazobactam (3 gm + 0.375 gm) through the I/V route OD for seven days, injection of flunixin meglumine (@2.2 mg/kg BW OD through the I/M route for five days) and injection of chlorpheniramine maleate (@ 1 mg/kg BW OD through the I/M route for seven days). Bolus serratiopeptidase (50 mg) was also prescribed twice a day for seven days. For further improvement of animal health condition, dextrose normal saline (5% @ 1 litre OD through I/V route) with multivitamin injection (10 mL through I/V route) was advised for the next three days after the operation. Antiseptic

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Fig. 1. The C-section delivered a dicephalus foetus with an unsevered umbilical cord



Fig. 2. Dicephalus foetal monster

dressings of the surgical wound was done once daily by douching with 10% povidone iodine solution followed by application of herbal fly repelling ointment and skin sutures were removed after 12 days of caesarean section. The treatment was in line with Verma *et al.* (2018) who also reported the use of parenteral antibiotics, supportive therapy and regular dressing as post-operative treatment. With this treatment schedule and management, the animal recovered uneventfully.

Considering the debilitated condition of the cow the farmer was also advised to feed 3.5 kg of compounded cattle feed of Type-I (minimum 22% crude protein) from the 5th day onwards in addition to the ration which the animal was usually provided by the farmer. The cow was also provided with 50 mL of oral calcium-rich supplement along with 10 mL of vitamin AD₃E once daily orally for 45 days. The farmer was also advised to follow routine vaccination and deworming schedule during the period. The animal's physical condition recovered considerably and showed the first signs of heat on the 68th day, but the farmer missed the heat and inseminated the cattle on the 2nd heat i.e., 89-90th postoperative day. Pregnancy was confirmed after 90 days of insemination through per rectal examination.

The dead foetus delivered was dicephalus (two separate heads) and often known as dicephalus diprosopus (two faces), which was a primitive streak stage anomaly. The foetus, as characterised had two heads, with each head having distinct nostrils, two eyes and two ears and a well-developed tongue (Fig. 2). Each head had a distinct atlas bone, and the caudal part of axial bones was fused and joined to a single vertebral column. Externally the neck, thorax, forelimbs, hindlimbs and abdomen seemed normal. On dissection, it was found that the foetus had a single trachea and the vital internal organs included a single normal-sized heart, lungs, alimentary system, liver, spleen and a pair of kidneys. Genetical or environmental factors and any other factor responsible for the incomplete separation of a primitive streak after day thirteen of fertilization may be responsible

for congenital duplication (McGirr *et al.*, 1987; Okur, 2021). As per Sharma *et al.* (2010), a single or combination of factors like genetic factors, prenatal infection by virus, toxic matter ingested by dam or deficiency of certain vitamins like vitamin A and folic acid may be the cause. Delivery by caesarean section is often practised as obstetrical management of conjoined twins (Whitlock *et al.*, 2008; Gupta *et al.*, 2020) which has also been adopted in the present study.

The present case study indicates that the congenital defect might not be hereditary in nature as the cow had a history of calving a healthy calf in its first calving inseminated with the semen of the same bull. Calves born from other dams with the same bull semen did not have any such abnormality either. Non-inherited teratogenic defects during embryonic development might have been the cause of such defects leading to dystocia, though further investigation is needed to confirm the actual cause of such a type of defect, which is beyond the scope of this paper. Due to such anatomical deformities, normal delivery was not possible. Observing the condition of the pregnant cow fetotomy was not attempted, moreover it involves severe manipulation; caesarean seemed to be the best option in this situation. The present case study also included a follow-up to the first conception post-C-section under the field conditions and consequently the cow conceived without any complications. It implies proper therapeutic and nutritional management may be of great help in post-operative conception.

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Author's contribution: PH, PB: Meticulously carried out the entire surgical process; PB, SB: Framed the manuscript and planned the necessary post-operative care schedule.

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