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Surgical management of congenital foetal hydrocephalus in a crossbred cow

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Abstract

A rare case of dystocia due to external congenital hydrocephalic foetus with ankylosis of forelimbs managed by ventral midline surgical approach in a crossbred cow is reported.

Keywords: *Dystocia, hydrocephalus, monster.*

Dystocia caused by various congenital foetal malformations have been reported in bovines and remains a challenging case especially for the field veterinarians due to the relatively lesser exposure that they have to such case presentations (Singh *et al*., 2003, Singh *et al.,* 2013). Among the various congenital malformations, hydrocephalus occurs sporadically with an incidence of only 0.15 per cent in bovines (Long, 2001). Congenital hydrocephalus is a dropsical condition which may involve either the ventricles or the sub-arachnoid space of the brain (Noakes, 2009). This condition usually leads to foetal cause of dystocia at calving, causing economic loss to livestock farmers. Hence, the present study reports a rare congenital malformation diagnosed as foetal hydrocephalus in a crossbred cow. The aim of the current study is to disseminate knowledge about the morphology, diagnosis and successful management of congenital foetal hydrocephalus.

A pleuriparous full term crossbred cow was presented to the TVCC, LUVAS, Karnal for treatment of dystocia with the history of continuous straining and ruptured water bags nearly 12 hours before. On general clinical examination, the cow was dull and exhausted while clinical parameters were within the normal range. Per-vaginal examination revealed a fully dilated cervix with a foetus in anterior longitudinal presentation and dorso-sacral position. Detailed morphologic examination of the foetus revealed an enlarged head with a marked fluctuating swelling over frontal and occipital region with softening of cranial bones and without any foetal reflex, resting on ankylosed extended forelimbs. Ankylosis of the limbs could also have contributed to dystocia. The case was diagnosed as dystocia due to congenital foetal hydrocephalus. The cow was stabilized with supportive therapy

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consisting of Inj. Calcium borogluconate 400 ml slow intravenous, Inj. Ceftiofur sodium 2.2 mg/kg body weight, intramuscularly; Inj. Flunixin meglumine 15 ml , intramuscularly; fluid therapy, rumenotorics and vitamin B-complex injection. Under epidural anaesthesia using 2% lignocaine, per vaginal delivery was attempted. The birth canal was well lubricated with the liquid paraffin. An incision was made by a guarded knife on the swollen foetal head to drain the fluid present in the cranial cavity. Per-vaginal delivery of the foetus was attempted by gentle traction but was not sucessful. Caesarean section was performed by ventral mid line approach following the standard procedure (Schultz *et al.*, 2008) and a dead hydrocephalic male foetus was delivered (Fig. 1). Dissection of foetal head revealed the presence of straw-coloured fluid in sub-arachnoid space, affirming that the foetus was malformed and congenital external hydrocephalus was also confirmed. The cow was discharged on same day after with appropriate suggestions for follow up with a protocol consisting of antibiotics, anti-inflammatory, rumenotorics, anti-histaminics and multivitamins all accompanied by a laxative diet for the next five days. The incision line and suture healed at 12 days after surgery and the cow showed an uneventful recovery after 15 days of surgery (Agerholm *et al.,* 2015).

There are many factors which may be responsible for the accumulation of abnormal volume of the cerebrospinal fluid in the brain tissues such as possible intra-uterine infection of the foetus by viral agents like bovine viral diarrhoea virus (Agerholm *et al.,* 2015) or this condition may also be due to the inheritance of a single autosomal recessive dominant gene with incomplete penetrance (Jabb and Kennedy, 1970; Purohit *et al*., 2012). Other predisposing factors for this malformation may include deficiency of vitamin-A or any other brain lesions that may cause a disturbance in the normal flow as well as the reabsorption of the cerebrospinal fluid (Ferris *et al*., 2011). The present case reported that congenital external hydrocephalus was morphologically characterized by a large sac containing serous fluid, hanging over the head and face. Similar observations have also been made earlier in cattle (Balasubramanian *et al*., 1997; Sunil *et al.*, 2016; Saini *et al*., 2019) and buffalo (Dhaliwal *et al*., 1998) calves. It has also been documented that this type of congenital malformation is usually accompanied by lesions of the musculoskeletal system (Agerholm *et al.,* 2015) as evidenced in the present study as well. In severe cases of hydrocephalus, caesarean section is recommended because it is very difficult to relieve dystocia by mutation and forced traction (Selvaraju *et al*., 2020).

Fig.1: Hydrocephalic foetus delivered by caesarean section.

The cause of death in hydrocephalic foeti may be due to pressure necrosis of the vital centres of the brain (Purohit *et al.,* 2012). If the hydrocephalic calf is born alive, the chances of long term survival are very low because of various lesions in the central nervous system. Congenital malformations involving central nervous system and musculoskeletal system are comparatively easier to diagnose when the foetus is in an anterior longitudinal presentation.

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