Case report

Animal Reproduction Update

Year 2023, Volume-3, Issue-1 (January - June)

ACS Publisher
www.acspublisher.com

Successful Management of Dystocia in Holstein Friesian Cow due to Hydrocephalic Fetus – A Case Report

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ARTICLE INFO

Key Words: Cow, Difficult birth, Dystocia, Hydrocephalus

doi: 10.48165/aru.2023.3.1.3

ABSTRACT

Hydrocephalus is a congenital condition caused by excessive accumulation of cerebrospinal fluid in the cranial cavity and this condition is reported less frequently in mammals. A 6 year-old Holstein Friesian cow was presented with the history of straining for 15 hours with rupture of water bag, but failure in the expulsion of the foetus. Per vaginal examination revealed hydrocephalic foetus without corneal and pedal reflex. This case was diagnosed as dystocia due to hydrocephalus condition in the foetus. The dystocia was relieved manually by evacuating the fluid by incising around the head region followed by application of traction force. Thereafter the animal was treated for three days with fluid therapy, broad spectrum antibiotic and anti-inflammatory drugs.

Introduction

The hydrocephalus (dummy or bawler calf) is a condition in which the cranial cavity is filled with excess amount of cerebrospinal fluid (CSF) and is characterized by swelling of the cranium that result in dystocia due to foetal causes. In cattle, hydrocephalus has been linked to a single autosomal recessive gene (Roberts, 1986) as well as hypo-vitaminosis A (Jubb and Kennedy 1970). Internal hydrocephalic calf will have dome-shaped head, while external hydrocephalic calf may show football-shaped head (Hareeswaraiah et al., 2020). Mammalian congenital anomalies have been reported on rare basis (McEntee, 1990). This condition has been observed in ewes, does, mares, and rams on rare occasions. It's common in pigs and sows, but it's uncommon in cattle and buffalo.

Case history and clinical observation

The straining of a 6-year-old Holstein Friesian cow was first noticed around 8 PM, whereupon the case was treated by a local practitioner unsuccessfully in the Kadavasal region in the Thiruvarur district (Tamil Nadu). In the next morning a qualified veterinarian was called from nearby veterinary facility to treat the case. The general physical examination of the animal showed a temperature of 38.5°C, heart and the respiratory rates were within the normal range with mild dehydration of the cow. Rectal examina-

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Received 02.08.2022; Accepted 27.09.2022
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tion of the animal revealed full term pregnancy with palpable foetal parts. The external genitalia were moderately oedematous possibly due to manipulation by the field veterinarian during dystocia handling. Per vaginal examination revealed complete cervical dilatation with the foetus in anterior presentation, dorso-sacral position and forelimbs extended into the pelvic cavity. Fluid filled swelling resembling football shape was evinced around the head region of the foetus during palpation. Suckling as well as corneal reflex was absent. Based on these findings the case was diagnosed as dystocia due to hydrocephalic condition in the foetus (Fig. 1 and 2).

Fig. 1: Hydrocephalic foetus

Fig. 2: Complete appearance of foetus

Treatment and clinical approach

Epidural anaesthesia was given in the first intercoccygeal space using 5 ml of 2% lignocaine. Even though the animal was straining continuously, the foetus was not expelled due to obstruction caused by the oedematous foetal head as well as due to oedematous external genitalia of the dam. Around 2 litre of magnesium sulphate diluted in water was applied on the vaginal region to reduce the oedema. One litre of castor oil was used per vaginally to provide lubrication during traction. The animal was restrained on lateral recumbency and an incision was made in the head region of the foetus pervaginally to reduce the size of the head region by evacuating fluid. After evacuating around 1.5 to 2 litres of fluid, snares were applied in the fetlock region of both forelimbs to aid in the traction. A dead hydrocephalus male foetus was expelled along with the placenta. Further vaginal examination of the dam was conducted to examine injuries to the reproductive tract. Two Cleanex boluses were kept inside each uterine horn to prevent further uterine infection. Abundant fluid therapy was given to rehydrate the animal along with broad spectrum antibiotic and anti-inflammatory drugs for three consecutive days.

Case discussion

The hydrocephalus is a condition caused by abnormal production of cerebrospinal fluid which leads to excess accumulation of CSF in the cranial cavity resulting in dystocia due to foetal causes. This condition is rare in mammals. Hydrocephalic condition can be either internal or external hydrocephalus. In internal hydrocephalus the body of the foetus is longer due to kyphosis and higher cephalic index caused by elevated internal pressure on the cranium than in external hydrocephalic calf as well as in normal calves. The external hydrocephalus calf is characterized by incomplete and the thinner bone along with ankylosis of the limbs.

Etiology

The etiology for hydrocephalus condition is multifactorial, including autosomal recessive gene and nutritional deficiency of vitamin A. Hydrocephalus condition can also be caused by various infectious causes, and environmental and genetic factors (Kalman, 1989).

Pathogenesis

There are two types of hydrocephalus condition reported in the foetus, namely internal and external hydrocephalus. The cerebrospinal fluid synthesized by the ventricular lining ependymal cells and the Pia-glial membrane enclosing the outer surface of the brain and the Pia- arachnid blood vessels. After synthesis CSF passes through the foramen of Monro from the lateral ventricle to the third ventricle, from where it passes to the fourth ventricle through the cerebral aqueduct of Sylvius. Later it leaves the fourth ventricle through the foramina of Luschka, one located on either side at the cerebellopontine angle, in the subarachnoid space. The internal/ non communicating type of hydrocephalus is caused by the accumulation of

cerebrospinal fluid in the ventricular system alone (Malik et al, 2017) or due to a clogging of one of the interventricular canals, usually the aqueduct of Sylvius and as a result fluid accumulates in the ventricles anterior to the occlusion. Second one is an external / communicating type of hydrocephalus in which fluid accumulates outside the brain in the subarachnoid spaces.

Clinical signs

In ruminants, hydrocephalus is frequently accompanied by enormous cranial enlargement, resulting in dystocia. This condition causes premature birth, stillborn birth or even death in affected animals. A moderate degree of ventricular distension makes an animal appear normal. Weakness, obtundation, weak suckling reflex, droopiness of head and ears, head tremors, muscular fasciculations, blindness, ventrolateral strabismus, nystagmus, tongue flaccidity, dysphonia, limb spasticity, hyper-reflexes, seizures, recumbency, retention of food material in the oral cavity, conscious proprioceptive deficits, and coma are the major clinical signs observed in affected calves.

Treatment

The treatment for hydrocephalus condition in foetus causing dystocia depend on the size of the foetal head, the texture of the cranial bone and amount of the fluid present in the cranial cavity. This condition can be treated by applying mutational force, foetotomy and caesarean section. Dystocia can be caused by a severe form of hydrocephalus that cannot be relieved by mutation or forced traction. Foetotomy may be necessary due to severe bony growth of the cranium in such cases (Roberts, 1971).

Conflict of Interest

The authors declare no conflict of interest

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