

CONGENITAL EXTERNAL HYDROCEPHALUS IN A CATTLE CALF AND ITS SURGICAL TREATMENT: A CASE STUDY

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SUMMARY

A newly born crossbred cattle calf was presented with the complaint of abnormal large round pot like growth on its head. On clinical examination, abnormal dome-shaped growth on skull, weakness, head tremors, poor suckling reflex and convulsions were observed. Neurologically, the calf was alert and responsive. On physical examination, beneath the skin a cavity filled with fluid was seen. From the case history, clinical and physical examination, confirmed that the crossbred calf had congenital hydrocephalus externally. Surgically hydrocephalus condition had recovered and treated calf reported to have normal suckling and behaviour.

Keywords: Hydrocephalus, Calf, Cattle

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Hydrocephalus is a neurological disease in which there is excessive accumulation of cerebrospinal fluid (CSF) within the ventricular system of the brain and in the duramater. The resulting increased pressure on the brain causes the clinical signs. It may be observed in young animals (less than 18- months age) or older animals (greater than 6 years old) and either sex are equally affected. This condition has been reported occasionally in the ewe, doe, mare and sow, whilst it is rarely seen in cattle and buffalo (Long, 2001). Clinical signs of hydrocephalus vary with the cause, the age of occurrence, the brain tissue being compromised and the degree of tissue damage. In general, the symptoms seen are a domed skull, increased intracranial cerebral pressure abnormal movement behaviour, problems with vision and auditory impairment, convulsions, mental disability and eventually leading to death.

In young animals, mostly congenital in origin, intrauterine or perinatal infections and perinatal trauma. In older animals, the condition is acquired later in life due to some disease process that blocks normal drainage of CSF. The outward signs are not as evident since the bones of the skull are already fused. Tufts of capillaries inside the ventricles are covered by ependyma to form choroid plexus. Cerebrospinal fluid (CSF) is mainly formed by the choroid plexuses of lateral ventricles. CSF thus formed passes to the 3rd ventricle through the two foramen of Monro. From 3rd ventricle it passes to the 4th ventricle through aqueduct of Sylvius. From the 4th ventricle a small amount of fluid passes through the central canal of spinalcord and the major portion escapes to the subarachnoid space through two laterally placed apertures

called foramen of Luschka and a centrally placed aperture called foramen of Magendie at the roof of 4th ventricle. The fluid is drained into the venous system mainly through the subarachnoid space.

An animal owner from Village Pandharabodi, district Bhandara (Maharashtra) visit at the Veterinary Polyclinic Hospital, Bhandara with his newly born male cattle calf having an abnormal large round pot like growth on its head (Fig. 1). On clinical examination, the symptoms were the abnormal dome-shaped growth on skull, weakness, head tremors, poor suckling reflex and convulsions. Neither the calf could stand on his own properly nor could he coordinate his movements. Neurologically, the calf was alert and responsive, papillary light reflexes and menace response was suspected. On physical examination, found that the frontal bones in the area of abnormal pot like growth were not formed and under the skin a fluid filled cavity. The calf's temperature, heart rate and respiration rate were found to be within normal range. From the case history and clinical examination, confirmed that the crossbred calf had congenital hydrocephalus.

The surgical site was cleaned and shaved. After scrubbing the site 2% lignocaine hydrochloride was infiltrated around the swollen part of the head for achieving the local analgesia. Finally, the site was scrubbed and painted with povidone-iodine. The accumulated fluid inside the cavity of abnormal head growth was aspirated outside with the help of needles. When almost maximum fluid was drained out, small stab incision was extended in both directions and the excess skin was removed taking deep incision. Then skin edges

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Fig. 1. Crossbred calf with external hydrocephalus



Figs. 2 & 3. (2) Skin edges are sutured with horizontal mattress pattern; (3) Crossbred calf 30 minutes post-operative

were sutured in horizontal mattress pattern with non-absorbable nylon thread (Fig. 2).

The crossbred calf was given Inj.DNS 450 ml slow i/v. with Inj. Meloxicam 0.2 mg/kg b.wt. for 3 days and Inj. Cefotaxime 10 mg/kg b.wt. i/m daily for 5 days. Antiseptic dressing of suture lines with betadine was done daily for 10 days post-operatively. The calf started walking normally just within 30 minutes after the surgery and even started suckling normally the same day (Fig. 3). After 14 days, the sutures were removed, and the animal showed normal behaviour till one month post-operatively.

The present findings in this case of external hydrocephalus confirmed the observations of Saini *et al.* (2019) and Yadav *et al.* (2021) also recorded very similar type of congenital hydrocephalus in buffalo-calf and cow-calf, respectively, with successful surgical management. According to Sastry (1971) the external hydrocephalus results from either too much fluid formed and not drained rapidly by the arachnoid villi or due to a hindrance to the drainage of a normally produces fluid during intrauterine life. The condition appears as a flaccid liquid. Congenital

hydrocephalus is seen sporadically in all large animal species, although it is relatively common in goat kid (Sharma *et al.*, 2015) and calves, and has been described in cattle (Saini *et al.*, 2019, Borkhatariya *et al.*, 2020), buffalo (Yadav *et al.*, 2021) and Camel (Abubokr *et al.*, 1998). Congenital hydrocephalus is reported in cattle (Sharda and Ingole, 2002).

The calf improved gradually following surgical treatment and ability to behave normal. No history of convulsion and tremors were recorded thereafter. The findings regarding poorly developed thinned frontal bones of the skull allowing accumulation of large volume of fluid externally in skin in dome-shape with signs of convulsion in the present case concurred with the observations of Whitlock *et al.* (2008), Mausami *et al.* (2014) and Saini *et al.* (2019).

The literature revealed that life span of the affected new-born was very less, but in this case, the calf was leading a normal life till 1 month of surgical treatment. A rare case of external hydrocephalus of crossbred calf and its successful surgical management has been put forward.

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