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Multiple Congenital Cephalic Defects in a Calf

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ABSTRACT

Congenital defects are common in animals but there is only one report of crossbred (Iranian native×Holstein) calf has been recorded in Iran. There were severe congenital deformities in the brain of a cyclopia calf. Forebrain structures include olfactory bulb (arrhinocephaly) and cerebral hemispheres (insepencephaly) have not been formed. Epiphysis and hypophysis have not been formed. There was only a single optic nerve.

Key words: Cyclopia, calf, aglossia, aprosencephaly

INTRODUCTION

Cyclopia is characterized by a single orbit in which global tissue is absent or rudimentary or in which eye balls vary from a single or two complete adjacent globes. Although there are many reports of cyclopia in human which have been studied in detail (Orioli *et al.*, 2011), there are some reports in domestic animals include pig (Evans, 1987), sheep (Roberts, 1986), dog (Njoku *et al.*, 1978), buffalo (Thippeswamy *et al.*, 1996) and cow (Ozcan *et al.*, 2006; Mohanty, 1968; Leipold *et al.*, 1977; Venu *et al.*, 2001) fetuses. These studies reported different anomalies of other organs.

On the etiological point of view, exposure of mother to different environmental agents is related to formation of organs. The opioids or some alkaloids (Fazel and Jalali, 2002), ethanol (Blader and Strahle, 1998), *Veratrum californicum* (Welch *et al.*, 2009) are related to cyclopia defect occurrence. This defect in human is related to some chromosome abnormalities, too (Fujimoto *et al.*, 1973; Burrig *et al.*, 1989). This is a report of cyclopia with some other cephalic congenital anomalies in a calf.

MATERIALS AND METHODS

A crossbred (Iranian native×Holstein) cow with dystocia referred the hospital of Faculty of Veterinary Medicine, Shahid Chamran University of Ahvaz. At vaginal examination a dead male fetus (weight = 29 kg) with deviation of head to left was found. After correcting the malposture, the fetus, affected cyclopia, extracted. The head of fetus had been separated and submitted for anatomical evaluation.

RESULTS

There was a big orbit in front of skull contained a large orbit without lower palpebra and with upper completely formed palpebra (Fig. 1a). Mouth and its appendices (e.g., tongue) have not been formed (anostomia and aglossi, Fig. 1b). Pharynx was obstructed and some of the gastrointestinal fluids were accumulated in the esophagus. There were severe congenital deformities in the brain. Forebrain structures include olfactory bulb (arrhinocephaly) and cerebral hemispheres (insepencephaly) have not been formed (Fig. 2a). There was only a single optic nerve (Fig. 2a). There was no epiphysis (Fig. 2b).

DISCUSSION

Congenital defects affects from 0.25 to 3% of calves. Most of the anomalies involve skeletal, muscular and central nervous systems (Roberts, 1986). Arrhinocephaly, anostomia, aglossia and anencephaly have been reported in this case. There is report of atypical cyclopia with prosencephalic aplasia and brachygnathia superior in a calf (Ozcan *et al.*, 2006). Cyclopia in many cases is associated with other abnormalities in the brain include holoprosencephaly (Arathi *et al.*,

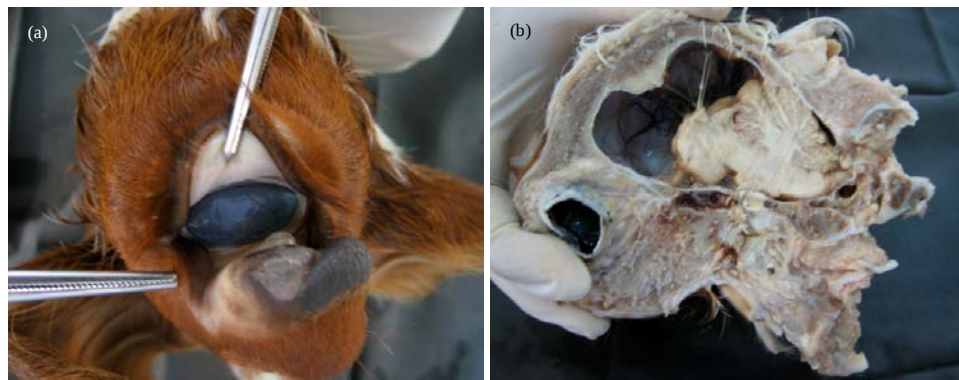


Fig. 1(a-b): Head of cyclopia calf: (a) Sagittal section of skull and brain shows aprosencephaly, astomia, aglossia and obstructed pharynx, (b) A big globe of eye with large upper palpebra and large ears

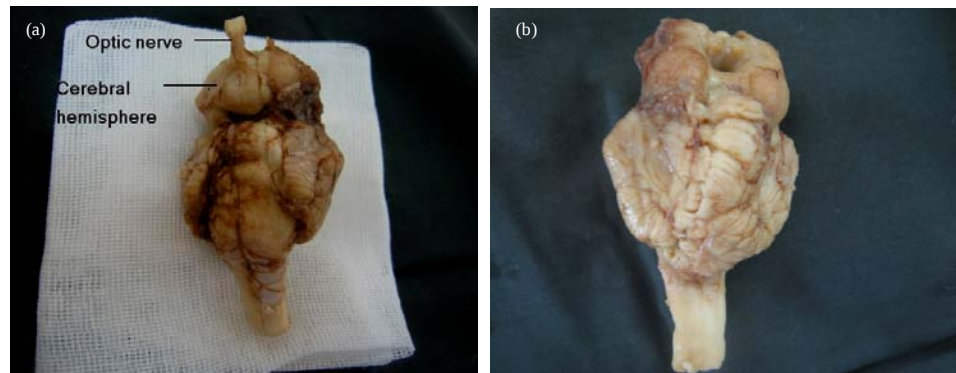


Fig. 2(a-b): Dorsal and ventral views of the dissected brain of cyclopia calf show (a) Single optic nerve and (b) plasia of episencephalon

2003; Sezgin *et al.*, 2002), agnatia (Sezgin *et al.*, 2002), arrhinocephaly (Shah *et al.*, 1963), otocephaly (Carles *et al.*, 1987), microstomia and anencephaly (Gupta *et al.*, 1981) and myelomeningocele (Burck *et al.*, 1982) in human, or abnormalities in the other parts of the body such as sinus inversus and retention of ductus arteriosus in pig 19 (Evans, 1987) and gonadal dysgenesis (Toews and Jones, 1968) in human.

Although, there is not any definitive cause for this defect (Roberts, 1986) and associated congenital abnormalities, Siebert (2007) reported a case of cyclopia-acardia-aprosencephaly complex and suggested that hypoxia-ischemia may play a role in the pathogenesis of some cases of holoprosencephaly and aprosencephaly.

The occurrence of defects in the animal husbandry of the respected region which has been reported other case of buffalo calf cleft palate (Mazaheri *et al.*, 2007) previously, is important in two point of views: to look for the possible related causes of defects in the region and to describe the anatomical features of the defect that may contribute in early diagnosis in farm animals.

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Dr. Khaksary described the anatomical features of the case and Dr. Barati was the clinician who examined and presented the case in the veterinary clinic of Shahid Chamran University of Ahvaz.

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