SKUAST Journal of Research 25(2): 371-373; (2023)
(*10.5958/2349-297X.2023.00038.7*); NASS rating: 4.17

Short Note

Dystocia due to crooked calf disease associated with inverted head and sternal deformity in a crossbred Jersey cow

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(Received February 18, 2023; accepted May 25, 2023)

A full term Jersey cross bred cow was presented with history of straining from last 12 hours. Per-vaginal examination revealed fetus lying in anterior presentation with head in inverted/upside down position and both forelimbs in the birth canal. Thorough physical examination of calf revealed multiple flexures of limbs, torticollis, chest wall deformity as well as inverted position of head. The condition was suspected to be crooked calf condition that has lead to development of dystocia. The dead crooked calf was delivered by emergency caesarean section.

Amongst the common causes of dystocia in cattle are fetal monstrosities and anomalies (Noakes *et al.*, 2001; Mir *et al.*, 2015). Crooked calf is a fetal monostrosity characterized by the presence of arthrogryposis of the forelimbs involving both the elbow and the carpal joints, variable presence of torticollis (wryneck, twisting of the neck), scoliosis (lateral curvature of the spinal column), kyphosis (humpback, dorsal curvature of the spinal column) and cleft palate (Morrow, 1986). Arthrogryposis is a relatively rare congenital musculoskeletal abnormality seen in all breeds of cattle, with higher incidence in some breeds (Windsor *et al.*, 2011) and has been associated with ingestion of Lupins alkaloids by cattle at highland pastures (James *et al.*, 1967). Sternal wall deformities have rarely been reported in large animals and have been found mainly in small animals and humans (Souza *et al.*, 2009).

Case History and Observation**s**: A cross bred Jersey cow was presented at field level with the main compliant of straining, anorexia and ruptured water bag since last 12 hours. The cow was in 3rd parity and at full term of gestation. Owner reported that the animal was straining continuously with unsuccessful delivery attempts. Per vaginal examination revealed fully dilated cervix with dead fetus lying in anterior longitudinal presentation with forelimbs in birth canal and twisted neck. Moreover, the joints of forelimbs were stiff and unable to bend and forehead of fetus was not palpable, suggesting that the fetus has multiple contractures of limbs, twisting of neck and an inverted head. Hence, it was diagnosed a case of dystocia due to crooked calf condition and it was decided to perform emergency caesarean section to relieve the dystocia. Treatment and Discussion: Fetotomy to deliver the fetus was not attempted in the present case due to complexity of the case and surgery was planned to deliver the fetus. Before surgery, the animal was stabilized by giving intravenous fluid 5% Dextrose Normal Saline (DNS). The animal was placed in lateral recumbency and ligocaine (50 ml of 2% lignocaine HCl) as local anesthesia by linear infiltration was given in the left flank region in an inverted L pattern. Following proper physical and aseptic preparation of the surgical site, a sharp vertical skin incision of approximately 40 cm length was made on the left flank region about 10 cm below the lumbar transverse process. After blunt dissection of the skin from the subcutaneous tissue, the incision was continued through the external and internal abdominal oblique, transverse abdominal muscle and peritoneum. The uterus was exteriorized and incision was given on the gravid horn in between the caruncles and extended as per the need. The crooked calf was removed with utmost care to avoid any tear to the uterus. Later, the uterus was closed using double lambert suture with no. 2 catgut (Medsurge Ind Pvt. Ltd., India). Then uterus and surrounding area were rinsed copiously with sterile isotonic saline solution before replacing it in the abdomen.

After proper abdominal lavage, the peritoneal incision was closed with a continous lockstitch pattern suture using 2 size sterile absorbable catgut. All the three abdominal muscular layer were separately closed with simple interrupted pattern using sterile silk. The skin was closed using silk in a horizontal interrupted mattress pattern. The surgical area was then properly cleaned and dressed with a 5% Povidone iodine solution. Post-operatively, four Furea boli containing 60 mg Nitrofurazone and 6 g Urea per bolus (Pfizer, India) were placed in the uterus, liquid Utrifit (200ml; P.O. for 3 days; Indian Herbs, India) and Inj. Oxytocin (Pitocin; 30 I.U. IM.

stat; Parke Davis Pharmaceuticals, India) were given to take care of any retained placenta and hasten the uterine involution. Combination of ampicillin sodium and cloxacillin sodium (AC-Vet Forte, 3g, BID, IM, Intas, India) and Meloxicam (Melonex, 0.5 mg/kg, OD, IM, Intas, India) were prescribed for four and three days respectively. The animal recoverd uneventfully after 10 days of removal of skin sutures.

Thorough physical examination of calf revealed multiple flexures of limbs mainly in both carpal and elbow joints of forelimbs, one short forelimb, torticollis, sternal wall deformities as well as inverted position of head (Fig. 1) The twisting of neck in this case was more than 90° which lead to upside down position of head. All the pedal joints of foetus had no movement. Various factors have been implicated for skeletal deformities in cattle like toxic substances (Binns and Lynn, 1967), nutrition (Burkett, 1959), hereditary (Roumcek *et al.*, 1957) irradiation (Mcfee *et al.*, 1965) and viral causes (Rousseaux and Ribble, 1988). Ingestion of Lupin-alkaloids during early gestation period has been found to be the most common cause of crooked calf disease (James *et al.*, 1967). As this case was reported in the area where cattle rearers are migratory in nature (Tribal people), and during summer upward migration of cattle to high land pastures, where there are enough quantities of different lupines species present in forest areas, an accidental grazing of these lupines might have caused the crooked calf disease. The second reason in this case might be due malnutrition, as these cattle rearers are only dependent on pasture foraging and concentrate ration is rarely fed to the livestock. These defects usually occur when the cattle eats alkaloid-lupine species between 40th and 70th day post Fertilization (James *et al.*, 1967).These alkaloids affect brain development in the developing fetus and this sedated fetus isn't moving enough, which leads to fixing and stiffing of joints and legs. The most common deformity in this disease is Arthogyrposis (James *et al.*, 1967). Mechanisms of Arthrogryposis development in fetuses include a reduction in the number of motor neurons resulting in paresis (Van Huffel *et al.*, 1988). Alkaloids present in lupines being acetylcholine receptor agonist, leading to paralysis (Green *et al.*, 2010).This results in a reduced locomotor capacity of the fetus which subsequently causes fibrosis of the joints, thus leading to fixation or Arthrogryposis (Green *et al.*, 2012).When Arthrogryposis is found associated with either of the other anomalies viz. kyphosis, scoliosis, torticollis or cleft palate, then the condition is called as a Crooked calf disease (Sprake, 2015).However the possible cause in the present case could not be ascertained.

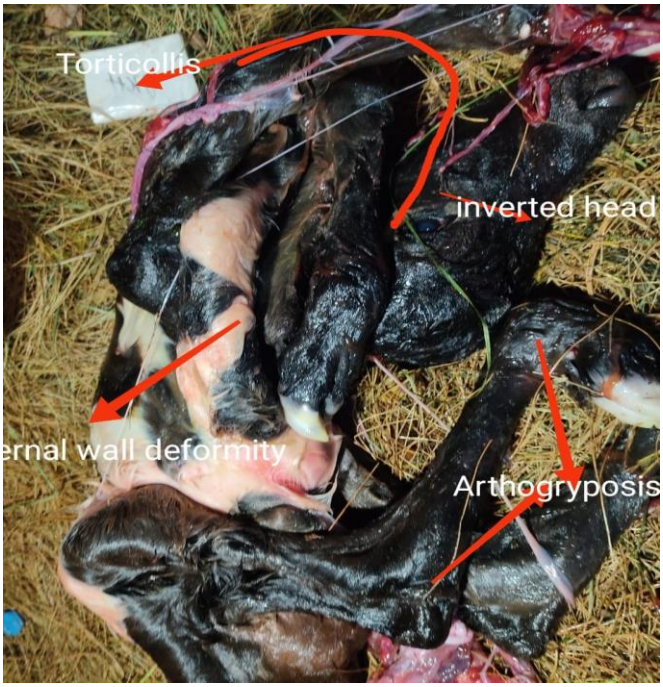

Fig. 1: Deformed fetus, showing inverted head and ankylosed joints of limbs (Marked in Red lines)

A successful management of dystocia caused by 'crooked calf disease' in a cross bred Jersey cow through caesarean section is documented.

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