Diprosopia, cerebral, cerebellar and pituitary aplasia in a Charolais-cross fetus

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Diprosopia refers to a form of incomplete monzygotic twinning where there is a single body with a head that has a variety of craniofacial duplication abnormalities. A three year-old Charolais-cross heifer was presented with history of being off-feed and dull. Two weeks before presentation the heifer had a prolapsed vagina which was replaced using a Buhner stitch, four days before presentation at our clinic, the vaginal prolapse relapsed. The pregnancy status was unknown and the heifer had been exposed to a bull for the previous 13 months before presentation. Upon presentation in our clinic, fetal membranes were protruding from the vulva and a vaginal discharge of one day’s duration was present. Physical examination revealed tachycardia (HR 112), tachypnea (RR 66), hyperthermia (39.8°C), and 7% dehydration. The heifer did not have any characteristic pre-calving udder development. Obstetric examination showed a partially dilated cervix with an autolyzed calf in a posterior longitudinal presentation, with bilateral hip flexure posture and dorso-sacral position. A paramedian ventral abdominal celiotomy was used to deliver a 60 kg bull calf with a crown rump length of 100 cm. Gross findings included macrosomia, hirsuitism, and fully erupted molar and premolar teeth. The fetus was diprosopic with hypertelorism and complete medial cheilopalatoschisis. The non-fused halves of the maxilla each had a nostril and were separated by a large skin fold. At necropsy the fetus was noted to have cerebral, cerebellar and pituitary aplasia. Cranial to the atlanto-occipital joint there were bone structures in the cranium resembling vertebrae. These vertebrae were directed ventrally, which created a partial separation between two spaces; a caudal space that contained spinal cord like material, but that lacked a clear distinction between grey and white matter, and a cranial space that contained soft tissue that encapsulated a developed eye with lens, uvea, and vitreous. The appearance of the fetus including the macrosomia, hirsuitism, and fully erupted teeth was compatible with prolonged gestation. The unusual features of this case included musculoskeletal defects such as severe cheilopalatoschisis, in combination with triophthalmia, and aplasia of the central nervous tissue and pituitary. The pituitary aplasia was the underlying cause of the failure to initiate parturition, resulted in a prolonged gestation and fetal macrosomia.

Keywords: Diprosopia, pituitary, cheilopalatoschisis, cerebral, aplasia