Clinical communication — Kliniese mededeling

Partial facial duplication (diprosopus) in a goat kid

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INTRODUCTION

Diprosopus, a term referring to a foetus with a single trunk, normal limbs, and varying degrees of facial duplication is an extremely rare malformation in both humans and domestic animals. However, a few cases of diprosopus have been reported in sheep, cattle, cats, horse and chicken.

Cases of diprosopus in goats have not been reported, although several cases of congenital malformations in goats such as dicephalus and multiple malformations have been reported. The present paper reports the clinical, anatomical, radiological and necroscopic observations in a diprosopic goat kid presented alive at the University of Zimbabwe Veterinary Teaching Hospital.

CASE HISTORY AND DESCRIPTION

A live male indigenous small East African malformed goat kid was brought to the University of Zimbabwe Veterinary Teaching Hospital. The kid was the first offspring delivered at term and there was no dystocia encountered during delivery. The kid was brought to the hospital 20 hours after birth, and had been unable to rise since birth. Pedigree information about the dam and sire was not available.

On physical examination, the goat kid had a gross deformity confined only to the face, characterised by a dome-shaped skull, duplication of eyes, mouth and nostrils (Figs 1, 2). The medial eyes were partially fused and occupied a single orbit, and were blind. Two other lateral eyes were in the normal position, and these appeared to be functional, with normal menace test and pupillary reflex. There were double nostrils with one on either side of the head, ventral and lateral to the central eyes. A tongue protruded from each oral cavity. The left oral cavity had the lower lip deviated centrally. Vocalisation was heard from both mouths and the mouths’ movements were synchronised during feeding or vocalisation.

The kid was breathing through both pairs of nostrils. The two faces shared a medial cheek and normal-appearing ears were seen bilaterally, but no ears were present on the medial side. The goat kid had a normal swallowing reflex, and was successfully fed on warm milk and glucose via both mouths. Cranial reflexes were present. After feeding with milk and glucose, the kid was able to rise. However, it had limb incoordination. The respiratory and heart rates recorded were elevated and the temperature was consistently subnormal. On inspection of the area where the goats were grazing, no known or suspected teratogenic plants such as Datura, Senecio and Veratrum spp. were identified.

Radiographs of the head showed two sets of jaws, three orbits, and a normal single trunk and normal limbs. The vertebral column, ribs, sternum, abdomen and thoracic and pelvic limbs appeared normal.

Abstract

The anatomical and clinical features of a live-born diprosopic goat kid are described. The kid had two faces with two eyes each, two complete oral cavities and nostrils and two ears. Caudal to the neck, the kid grossly appeared normal. Both mouths of the kid showed synchronous sucking motions. Elevated respiratory and heart rates were recorded and the temperature was subnormal. Radiological examination showed a single trunk and vertebral column, normal limbs, two sets of jaws, three orbits, and contrast radiography revealed a single patent oesophagus. There was maxillary and mandibular duplication resulting in two faces. There was a cleft palate. The oropharyngeal regions of each face merged to form a single laryngopharynx and oesophagus. There was a single brain with hypoplasia of the cerebellum. The left and right cerebral hemispheres were fused rostrally, and there was duplication of the optic chiasma and the pituitary gland. The olfactory tract was absent and the superficial origins of most of the cranial nerves were not discernible.

Key words: cerebellar hypoplasia, cleft palate, diprosopus, goat, malformations.

In the cerebral tissue, there was severe congestion, haemorrhage and neuronal degeneration.

On necropsy each face had nostrils, an oral cavity and a protruding tongue. Two complete separate jaws were present although the medial lower jaws were shortened. There was a cleft palate in both the hard and soft palates. The oropharyngeal regions of each face merged to form a single laryngopharynx and a single oesophagus and there was a single trachea. The two tongues fused caudally, forming one body giving a Y-shape, and entered a single pharynx. The hyoid apparatus was wider than normal, probably reflecting the doubling of the lower jaws. There was no duplication of internal thoracic and abdominal organs.

On opening the skull, the kid had a single abnormal brain. Marked hypoplasia of the cerebellum was noticed. The left and right cerebral hemispheres were fused rostrally and the falx cerebri was not clearly reflecting the doubling of the lower hemispheres. The left and right cerebral hemispheres were fused rostrally and hypoplasia of the cerebellum. In most cases of diprosopus described in humans, the most common additional feature found is anencephaly. However, anencephaly was not present in this case and has also not been reported in cases of diprosopus in domestic animals, including sheep, and cattle.

There has been little research on the aetiology or initiating cause of diprosopus. In farm and companion animals, there are no reported cases available where surgical intervention was performed, probably because most of the cases died a few hours after birth or because of the high costs associated with surgery.

The aetiology or initiating cause of diprosopus is not well understood. Two possible initiators are exogenous factors or genetically encoded morphological errors. Exogeneous causes of facial anomalies include (1) factors causing environmental stress early in embryological development, such as hyperthermia and hypoxia, nutritional deficiencies and hormonal imbalances, (2) viral and toxoplasma infections, and (3) toxins, drugs and chemicals. In the present case, the role of infectious agents, parasites and drugs could not be obtained because there were no records and history of husbandry of the dam and sire. Similarly the role of genetic factors could not be determined because of the absence of breeding history. Common teratogenic plants such as Datura, Senecio and Veratrum spp. which cause malformations in ruminants were ruled out in this case because no such plants were found during inspection of the grazing area. In conclusion, there is need for further studies to elucidate the aetiology and morpho-pathogenesis of facial malformation in domestic animals.

REFERENCES

5. Grimwood B, O’Connor G, Gaafar H A 1983 Toxofactor associated with Toxoplasma gondii infection is toxic and teratogenic to mice. Infection and Immunity 42: 1126–1135
WHO/FAO/OIE guidelines for the surveillance, prevention and control of taeniosis/cysticercosis

K D Murrell (Editor), and P Dorny, A Flisser, S Geerts, N C Kyvsgaard, D P McManus, T E Nash and Z S Pawlowski (Associate Editors)


Millions of persons worldwide are infected with the ‘pork tapeworm’ (Taenia solium), Taenia saginata (‘beef tapeworm’) and Taenia saginata asiatica (‘Taiwan pork’). Of these, T. solium is considered the most serious species because it threatens public health and reduces livestock production. Sub-Saharan Africa has received more attention recently due to reports of the extent of neurocysticercosis (larval infection of the central nervous system in humans) in epilepsy, a disease that is now the subject of neurocysticercosis. Treatment of neurocysticercosis includes symptoms and diagnostic criteria for neurocysticercosis. Treatment of neurocysticercosis includes symptoms and diagnostic criteria for neurocysticercosis. Chapter 2 focuses on the diagnosis and treatment of clinical cysticercosis. This is a common and preventable cause of neurological disease in many areas of the developing world with neurocysticercosis the greatest contributor to the disease burden. Teniasis and cysticercosis contribute to the intersectoral coordination and collaboration achieved between medical and veterinary services in various countries, including sub-Saharan Africa and how it is crucial for effective sustainable surveillance and control efforts. A Flisser, D Correa, G Avilla and P Marvilla review the biology of these zoonotic tapeworms in Chapter 1. The 3 species are compared using descriptive illustrations and diagnostic details (e.g. scolex, proglottids and eggs).

Chapter 4 focuses on detection and diagnosis of these tapeworms. P Dorny, J Brandt and S Geerts. Differential diagnosis using morphological criteria, enzyme electrophoresis, molecular techniques and survey techniques with tapeworm carriers is described. Coprriorul examination using conventional fecal examinations, peri-anal swabs, coproantigen detection, copro-PCR and serological tests are presented. The diagnosis of Taenia solium cysticercosis in humans using parasitological methods, imaging and serology, antibody and antigen detection methods, infection are presented in 6 chapters. Special attention is given to the intersectoral coordination and collaboration achieved between medical and veterinary services in various countries, including sub-Saharan Africa and how it is crucial for effective sustainable surveillance and control efforts.