Global Veterinaria 10 (3): 250-252, 2013
ISSN 1992-6197

DOI: 10.5829/idosi.gv.2013.10.3.7238

Deradelphous Cephalothoracopagus in Lambs

Ali Louei Monfared

Department of Anatomy, Faculty of Para-Veterinary Medicine, University of Ilam, Ilam, Iran

Abstract: Deradelphous Cephalothoracopagus is a congenital anomaly which is defined as an abnormality of structure or function present at birth. Conjoined twinning has been reported in most domestic animal species. This paper describes a case of twins were born with 3.7 kg weight and crown-rump length of 54 cm. The twins had two nearly opposite fused bodies without heads that was classified as Cephalothoracopagus. Twins had two bodies and distinct spines, with 4 feet and 4 hands. Intestines and viscera were duplicated. Histological structure of testicular tissue samples showed atrophy and degeneration and in liver samples, hyperemia, necrosis and degeneration were observed. Two distinct pelvises each with one pair of normal hind limbs were also present. Blood samples revealed no hematologic disorder in peripheral blood smears.

Key words: Congenital Defects · Deradelphous · Lamb · Cephalothoracopagus

INTRODUCTION

Congenital defects are abnormalities of structure and function that are distinguishable before birth (prenatally), at birth, or years later. They may induce a single anatomic structure or function, whole system, or parts of several systems [1]. Multiple congenital anomalies often occur together, as an abnormality of one part of the body often leads directly to the malformation of other body parts [2].

Conjoined twins are classi?ed, according to the most prominent site of connection, in craniopagus, cephalopagus, thoracopagus, omphalopagus, pygopagus, ischiopagus and rachipagus [3,4].

It has been demonstrated that the majority of human and animal malformations are due to multifactorial etiology [5]. Conjoined twins are imperfectly separated monozygotic twins. It is thought that conjoined twins are more common in cattle than in other domestic animals [1]. In addition, incidences of craniofacial defects are higher in sheep than in other domestic animals [6]. The causes of conjoined twins have still not been clearly elucidated. Congenital defects are induced by genetic or environmental factors (infectious diseases, viruses, drugs, poisonings, plants, mineral salts and vitamin (A, D, E) deficiency), hormonal factors and physical reasons or by their interactions [7].

Cephalothoracopagus is a very rare form of conjoined twins; it is characterized by fused head and thorax but separate spines, limbs and pelvis [8]. The aim of this case report is to present the macroscopic and microscopic anatomical abnormalities in neonatal lambs.

Case History: A 4.5 year-old pregnant ewe belonging to a flock with 185 sheep and 56 goats was referred to the local veterinary clinic located in Lumar city of the Ilam province. Male Lambs was born with 3.7 kg weight and crown-rump length of 54 cm. Twins had two bodies with 4 feet and 4 hands, without head. Lambs had two distinct spines, their intestines and viscera were duplicated. Some peripheral blood smears were taken for blood cell morphology and parasite infestation. In addition, for microscopic investigations, some histo-pathological specimens were obtained from all visceral organs and after staining by Hematoxyline and Eosin stain, the tissues were studied under light microscope. There was no history of congenital abnormalities in the flock.

RESULTS AND DISCUSSION

The twins had two nearly opposite fused bodies without heads that was classified as Cephalothoracopagus. Marked incomplete development

Corresponding Author: Ali Louei Monfared, Department of Basic Sciences, division of anatomy and histology, Faculty of Para-Veterinary Medicine, University of Ilam, Ilam, Iran, Pajoohesh Street, Bangonjab, University of Ilam, Ilam, Iran, Tel: +98-8412222015 & +989183419098, Fax: +98-8412222015.

Fig.1: Ventral view of conjoined twins

Fig.2: Dorsal view of conjoined twins

of the thoracic cavity, together with the respiratory system was present. The thorax appeared to be unique, showed single trachea and lung, respectively (Fig.1), although the abdominal cavity was duplicated. Testicular tissue samples showed atrophy and degeneration and in liver samples, hyperemia, necrosis and degeneration were evident. Two distinct pelvises each with the one pair of normal hind limbs were also observed (Fig.2). Also peripheral blood smears showed no hematologic disorder.

Duplication of the caudal parts of the body is most frequent among the ewe conjoined twin anomalies [9].

The conjoined twinning, on the basis of the fusion of the geometrical plans, was classi?ed as a cephalopagus according to the classi?cation proposed by [4]. Although conjoined twinning has been described in most of the animal species and humans, cephalothoracopagus results are scarcely reported. A case of cephalothoracopagus has been previously described in sheep [10].

A case of Craniothoracopagus (Monocephalus, Thoracopagus, Tetrabrachius) has been recently described in dog [11] and in an ostrich [12]. It means that congenital defects, especially in sheep are probably more common than the reports indicate. In fact it may be due to the method of husbandry prevailing in most sheep [13].

Teratogens including toxic plants, infectious agents, drugs, trace elements deficiencies and physical agents such as radiation, hyperthermia and embryo manipulations, are in the scope of possible other factors that may cause this congenital defect [7].

Genetic defects may result in pathological or patho-physiological abnormalities as a result of mutant genes or chromosomal aberrations [14] and particularly recessive genes [13]. However, genetic and environmental factors, or their interaction, are the most common causes [13].

In our studied case, information neither supported inbreeding nor an evidence suggesting that the duplication was environmentally or genetically or a combination of both, induced [8].

REFERENCES

1. Ünver, O. and M. Kilinc Özyurtlun, 2007. Cranial Duplication (Dicephalus) in a Lamb. Turkey JournalVeterinary Animal Science. 31(6): 415-417.
2. Camón, J., D. Sabaté, J. Franch, M.A. López-Béjar, J. Pastor, J. Rutllant, J. Ordeig, E. Degollada and J. Verdú, 1990. Associated multiple congenital malformations in domestic animals. Contribution of four cases. Zentralbl Veterinarmed A., 37: 659-668.
3. Duhamel, B., 1966. Morphogene se Pathologique. Paris, France: Masson & C.

4. Kingston, C.A., K. McHugh, J. Kumaradevan, E.M. Kiely and L. Spitz, 2001. Imaging in the preoperative assessment of conjoined twins. Radiographics, 21: 1187-1208.
5. Mazzulo, G., A. Germana, G. De Vico and G. Germana, 2003. Diprosopiasis in a lamb. A case report. Anatomia, Histologia, Embryologia. 32: 60-62.
6. Shojaei, B., A. Derakhshanfar, M.M. Oloumi and S. Hashemnia, 2006. Diprosopus, spina bifida and kyphoscoliosis in a lamb - a case report. Veterinary Arhiv., 76: 461-469.
7. Dennis, S.M. and H.W. Leipold, 1986. Congenital and inherited defects in sheep. In: D.A. Morrow. Ed. Current Therapy in Theriogenology 2nd edn. W.B. Saunders Company, Philadelphia. pp: 864-867.
8. Mazzullo, G., F. Macri, G. Rapisarda and F. Marino, 2009. Deradelphous Cephalothoracopagus in Kittens. Anatomia, Histologia, Embryologia. 38: 327-329.
9. Deniz, N., Y. Rahsan, Y. Gülnaz and N. Yavuz, 2011. A rare case of Diprosopus, Tetraophthalmus and Meningoencephalocele in a Lamb. Kafkas Universitesi Veteriner Fakultesi Dergisi. 17(2): 333-336.
10. Cazabon, E.P.I. and A.O. Adogwa, 2003. A case of cephalothoracopagus in sheep in Trinidad and Tobago. The Canadian Veterinary Journal. 44: 56-58.
11. Nottidge, H.O., T.O. Omobowale, J.O. Olopade, O.O. Oladiran and O.O. Ajala, 2007. A case of craniothoracopagus (Monocephalus Thoracopagus Tetrabrachius in a dog). Anatomia, Histologia, Embryologia. 36: 179-181.
12. Mazzullo, G., G. Montalbano, A. Augello, A. Germana and B. Macri`, 2007: A case of conjoined cephalopagus twinning in an ostrich (Struthio camelus). Anatomia, Histologia, Embryologia. 36: 263-265.
13. Dennis, S.M. and H.W. Leipold, 1979. Ovine congenital defects. Veterinary Bulletin. 49: 233-239.
14. Leipold, H.W., S.M. Dennis and K. Huston, 1972. Embryonic duplications in cattle. Cornell Veterinary. 62: 572-580.