Turkish Journal of Veterinary & Animal Sciences

Volume 34 | Number 6 Article 12

1-1-2010

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TÜBİTAK

Case Report

Turk. J. Vet. Anim. Sci.
2010; 34(6): 553-556
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doi:10.3906/vet-0908-26

Several congenital abnormalities in a neonate of a Mixed Mehraban sheep

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Received: 10.08.2009

Abstract: A 3-year-old mixed Mehraban sheep, in second parturition, was brought to Kazerun Veterinary School with signs of dystocia. The neonate had 2 separate heads with a common neck (dicephalus). Anal atresia, meningomyelocele, arachnomelia, and spina bifida were found in the neonate. In addition, it had 2 esophagi, but they became united after the esophageal hiatus. The tongue and larynx in each head were normal. It had 2 tracheas and 2 lungs with each trachea entering a separate lung. The lungs had many lobes. The heart had compensatory hypertrophy and had 2 pulmonary trunks. The abdomen and other body systems were normal.

Key words: Dicephalus, anal atresia, meningomyelocele, arachnomelia, spina bifida, lamb

Introduction

Multiple births most frequently result from fertilization of separately ovulated female gametes. However, complete or partial separation of cleavage stage blastomeres and blastocysts, or duplications during gastrulation can also result in the development of multiple organs. Such embryos are categorized as being free (unattached) or conjoined, and symmetrical or asymmetrical (1). All conjoined twins are monozygotic in origin and represent incomplete division of 1 embryo into 2 components, usually at some time during the primitive streak stage. It is also possible to have duplication of one part of the future axial (and adjacent) structures. These usually arise during primitive streak elongation or regression (1).

Conjoined twins have been reported in farm animals such as sheep and cattle (2,3). The incidence of conjoined twins is reported from 1 in 50,000 to 1 in 100,000 births (4,5). Dicephalus is one kind of conjoined symmetrical twins (6). The reported incidence of dicephalus is 2 in 27 anomalous twin lambs (7). The aim of the present study was to describe some gross anatomical abnormalities in a neonatal dicephalus lamb.

Case History

A 3-year-old mixed Mehraban sheep, in second parturition, was brought to the veterinary clinic of Islamic Azad University, Kazerun branch, Kazerun,

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Iran. The animal had clinical symptoms of dystocia. After a primary clinical examination, it was found that fetus was in anterior presentation, dorso-sacral position with extended forelimbs, and had 2 heads. The heads were flexed to the left side of the dam. The position of the heads was corrected and the dead fetus was delivered via the vagina, after epidural anesthesia.

Results and discussion

The neonate had 2 separate heads with a common neck. However, its trunk and hind limbs were normal. There was no bony joint between the heads, but they were joined together by muscular tissue of occipital origin. Both brains and medulla spinalis were normal. Spina bifida was another abnormality seen in the neonate and there was a cleft at the dorsal part of the vertebral arches of C5, C6, and C7 (Figure 1); the other one was meningomyelocele, protrusion of the spinal cord and meninges (Figure 1). The neonate had long forelimbs with muscular atrophy (arachnomelia) (Figure 2) and had anal atresia (Figure 3). After dissecting, the occipital condyles were normal. These occipital condyles joined to one deformed atlas vertebra that had articular surface for them. Axis vertebra had torsion and a deformed shape; also the 3rd and 4th cervical vertebra had a slight form of torsion. The 5th, 6th, and 7th ones were not completely formed (Figure 4).

The tongue and larynx in each head were normal and the esophagus was duplicated. It had 2 esophagi, but they became united after the esophageal hiatus (Figure 5). It had 2 tracheas and lungs, with each trachea entering a separate lung. The lungs had many

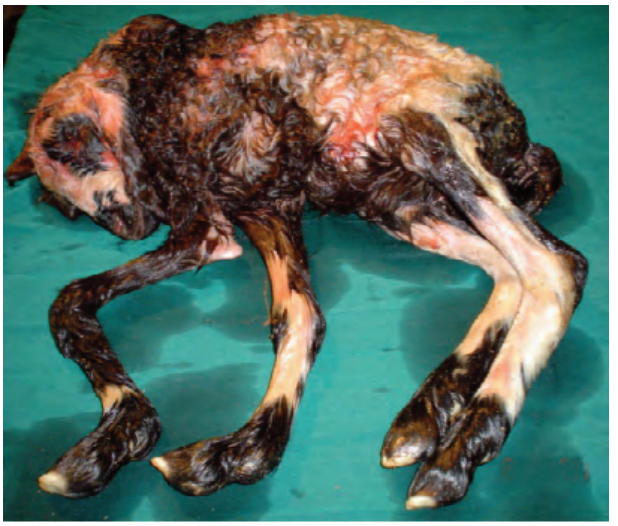

Figure 2. Long hands with muscular atrophy or arachnomelia.

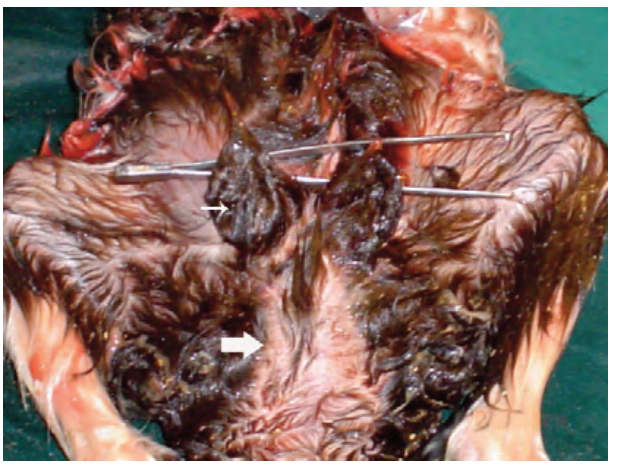

Figure 3. Anal atresia (thick arrow) observed under the testicles (thin arrow).

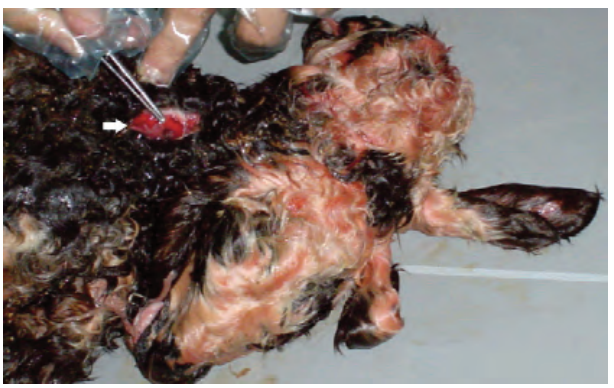

Figure 1. Spina bifida and meningomyelocele (thick arrow).

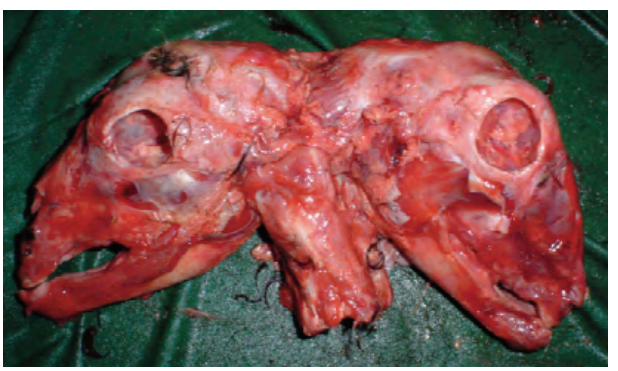

Figure 4. Dicephalus cojoined symmetrical twins.

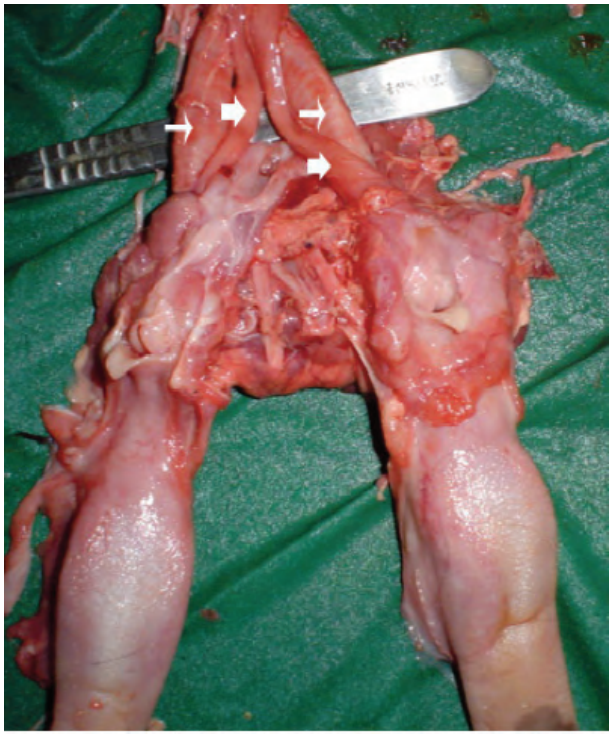

Figure 5. Duplication in the esophagus (thick arrow) and trachea (thin arrow).

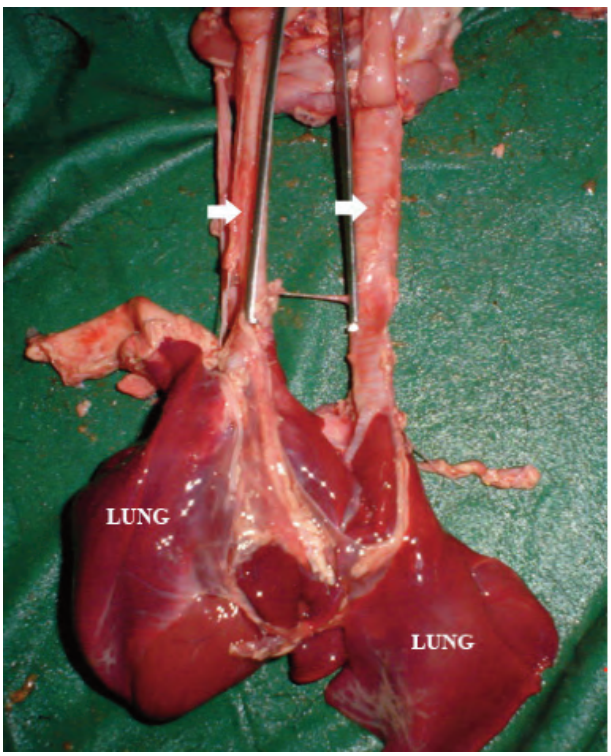

Figure 6. Two tracheas (thick arrow), with each entering a separate lung.

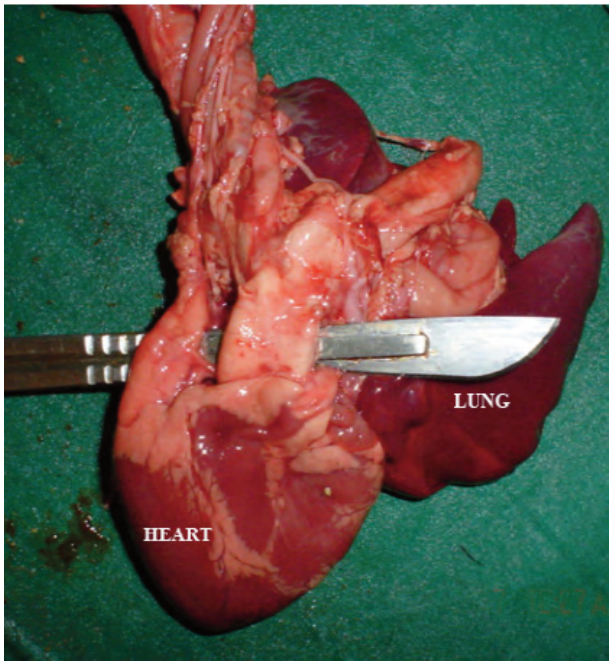

Figure 7. Compensatory hypertrophy of the heart.

lobes. The cranial and caudal lobes of the left lung were divided into 2 parts; the cranial and middle lobes of the right lung were also divided in the same way (Figure 6).

It had one heart, which had compensatory hypertrophy (Figure 7). The case was supposed to be a tetralogy of Fallot, although pulmonary stenosis was not checked. The heart had 2 pulmonary trunks. The right pulmonary trunk originated from the right ventricle and entered the right lung. The left pulmonary trunk originated from the right ventricle, as an orifice on the internal surface, first continued to myocardium then went to the left lung. There was no bifurcation in the pulmonary trunk. There was a large orifice on the membranous part of the interventricular septum. The aorta was normal, but abnormally the left and right common carotid directly originated from the aorta. The abdomen and other body systems were normal. The central nervous system had a normal anatomical appearance.

The present case is a complex of some anomalies. There are many conditions that may relate to these congenital defects (3,6). The causes of congenital defects include inherited diseases, drugs, nutritional deficiencies, enzyme and trace elements deficiencies, infectious and toxic environmental agents, and

physical agents and interactions between them (3,6). In many conditions, clinicians may not keep a good history of the mother and detection of a causative agent may be impossible.

In the present study we did not detect the causative agents, but it is possible that they had the same or related factors.

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