NOTE

Theriogenology

A Case of Perosomus Elumbis in a Holstein Calf

Jung-Min SON1), Hwan-Yul YONG2), Doo-Soo LEE1), Ho-Jung CHOI1), Seong-Mok JEONG1), Young-Won LEE1), Sung-Whan CHO1), Sang-Tae SHIN1) and Jong-Ki CHO1)*)

1)College of Veterinary Medicine, Chungnam National University, 220 Gung-dong, Yuseong-gu, Daejeon 305–764 and
2)Lab. of Veterinary Biotechnology & Embryology, BK21, College of Veterinary Medicine, Chungbuk National University, Cheongju 361–763, South Korea

(Received 28 February 2007/Accepted 9 January 2008)

ABSTRACT. Perosomus elumbis is an occasionally found congenital anomaly of unknown etiology and is characterized by partial or complete agenesis of lumbar, sacral and coccygeal vertebrae and ankylosis of the hindlimbs. A 2-day-old female Holstein calf presented nearly normal forelimbs but flexure and ankylosis of the hindlimbs. The vertebral and pelvic malformations and agenesis were radiographed and then necropsied. Mild ankylosis of the hindlimbs, absence of cauda equina, left scoliosis in state of fusion of T11 and T12 and complete fusion of L4 and L5, narrowed pelvic canal and misshapen ilium were confirmed. However, abnormal development or agenesis was not observed in the urogenital and intestinal system in this calf.

KEY WORDS: Holstein calf, perosomus elumbis.

Perosomus elumbis is an occasionally found congenital disease of swine, sheep and dogs and is more commonly seen in cattle [4, 7, 9]. It is characterized by partial or complete agenesis of lumbar, sacral and coccygeal vertebrae and usually includes arthrogryposis of the hindlimbs and malformations of the musculature. This anomaly was first reported in a calf in the veterinary literature in 1832, and since then many cases have been reported [6]. However, its accurate etiology has not been fully elucidated.

A 2-day-old female Holstein calf that presented atrophy and paresis of the hindlimbs, malformation of the anus and vulva and agenesis of the tail was referred to the Veterinary Medical Teaching Hospital of Chungnam National University (Fig. 1). It was born uneventfully from a parturient dam bought at a local cattle market. The calf had a shortened trunk, weighed 34.25 kg and was unable to stand on its hindlimbs but appeared to have normal movement of the front limbs. In addition, yellowish soft stool oozed from the small and everted anus, and blood was observed intermittently. Mucus streamed down its enlarged and aberrant vagina, but urination was comparatively normal.

Its complete blood count and blood chemistry examinations revealed a fairly normal state, except for a white blood cell (WBC) count of 36470/µl and thrombocyte count of 1.444 × 106/µl. Radiographic analysis revealed that the vertebral column was abruptly truncated at the L6 level, with agenesis of the sacral and coccygeal vertebrae. Also, asymmetric 12th rib in state of fusion of T11 and T12, complete fusion of L4 and L5 and narrowed pelvic canal were found (Fig. 2).

Fig. 1. A 2-day-old Holstein calf affected by perosomus elumbis. a) Note the lack of development of the caudal part of the body, paresis of the hindlimbs and b) A small and everted anus and enlarged and aberrant vagina.

*Correspondence to: Cho, J.-K., Laboratory of Theriogenology, College of Veterinary Medicine, Chungnam National University, Daejeon 305–764, South Korea.
e-mail: cjki@cnu.ac.kr
The body of the calf was rotated twice daily to prevent pressure sores, and 3–4 l of colostrum was administered to ensure adequate passive immunity within 24 hr postpartum. Two daily feedings of 2.7 to 3.4 kg whole milk were also administered for 12 days. The calf lived for thirteen days, but was euthanized at the owner’s request due to the severity of its lesions.

Postmortem examination showed that the abdominal organs were fairly normal except for a horseshoe kidney. Interestingly, neither abnormal development nor agenesis was not observed in the urogenital and intestinal systems of this calf. In addition to the mild ankylosis of the hind limbs, severe atrophy of the distal portions of the lumbar muscles and of the hind limbs were observed. In the vertebral column, apart from the cauda equina being absent, left scoliosis was confirmed in state of fusion of right T11 and T12 and narrowed pelvic canal were presented.

Perosomus elumbis is a fairly common congenital defect in cattle [7, 9]. Malformation or improper migration of the neural tube during the tail-bud stage, accompanied by partial agenesis of the caudal spinal cord, appears to be the cause of this abnormality [5, 6]. Abnormal development usually occurs when a threshold of genetic and environmental insults is attained and the fetal compensatory mechanisms are overcome [10]. Thus, purely genetic defects can originate from the dam, the sire or both, and environmental teratogens are usually numerous, as are nutritional deficiencies and excesses, chemicals, drugs and biotoxins. Moreover, ingestion of the plant Veratrum californicum by Merino sheep has been considered a possible cause of fetal deformities [3]. However, its accurate etiology is still unknown. In this case, because the dam was purchased while in a late stage of gestation, the exact teratogen was unclear. In cases of perosomus elumbis, complications are encountered when spontaneous labor is attempted because the hind limbs are often ankylosed and distorted [8]. Regardless, many of the calves described in the literature were stillborn or dead on presentation [1, 2, 6]. Compared with another case reported in Korea [11], the birth of the calf in this report was completely normal and the calf lived without extraordinary effort until euthanasia because it had normal gastrointestinal function except for an everted anus. Moreover, this calf eventually tried to stand on its own and maintained a sternum position intermittently in which it feel most comfortable to respire. Further research is necessary to identify the etiology of perosomus elumbis.
REFERENCES