Absence of Floating Ribs with Corresponding Thoracic Vertebrae of Black Bengal Goat (Capra hircus)

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Received: 20 June 2013; Accepted: 18 August 2013

SUMMARY

A black Bengal goat (Capra hircus) revealed 12 pairs of ribs and 12 thoracic vertebrae instead of typical 13 pairs. In this condition, basal lobe of the lung extended up to the base of the 10th rib. The spleen was located below the proximal part of the 12th rib to middle of 8th rib of left side obliquely. The caudate lobe of liver was out of the caudal border of last rib. The left kidney was located below the transverse processes of first and second lumbar vertebrae whereas, right was under the second, third and fourth lumbar vertebrae. These abnormalities did not accompany with any other skeletal deformities.

Key words: Black Bengal goat, Ribs, Vertebrae

Topographic position and bony landmarks facilitate to locate and examine the deeper organs. It also facilitates to correct the various surgical conditions and diagnosis of various diseases. This congenital anomaly was not reported in black Bengal goat, however, it was observed during dissection of this formalin fixed animal. The changed topographical positions of various internal organs due to this anomaly were recorded.

During dissection, 12 pairs of ribs (8 pairs sternal and 4 pairs asternal) along with their corresponding 12 thoracic vertebrae instead of typical 13 pairs of ribs and 13 thoracic vertebrae were observed. The lumbar vertebrae were typically 6 in number. The elongated transverse processes and absence of articular facets for ribs proved the 20th number of vertebra of the vertebral column as lumbar vertebra. The vertebral formula was C7 T12 L6 S4. Usually goats have typically 7 cervical, 13 thoracic, 6 or 7 lumbar and 4 to 8 sacral vertebrae (Sisson, 1975). Among the 13 pairs of ribs, first 8 pairs were true ribs and last 1 pair was floating rib (Sisson, 1975). The visceral organs within the thoracic cage were in disposition in relation to arrangement of ribs and vertebrae. The basal lobe of the lung was extended up to the base of the 10th rib on both sides. But Sisson (1975) stated that basal lobe of the lung of ruminants extended up to proximal part of 11th rib on both sides. Spleen was located below the proximal part of the 8th to 12th rib of left side obliquely and its long axis corresponded to a line drawn from the vertebral end of the last rib to about the middle of the eighth rib. Sisson (1975) stated that its long axis was extended from vertebral end of last rib to about the middle of the tenth intercostal space. The liver was located at the right side from 7th rib to cranial border of 1st lumbar transverse process and the caudate lobe of liver was out

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Fig. 1. Relative positions of deeper organs of the thoracic cage towards right side showing first rib (R1), lungs (Lu), seventh rib (R7), eighth rib (R8), liver (L) and kidney (K).
of the caudal border of last rib (Fig. 1). Kandeel et al. (2009) found that the liver was located obliquely from 7th to 12th intercostal space in an animal having 13 pairs of ribs. Due to absence of last rib, liver was extended up to the level of transverse process of 1st lumbar vertebra towards right side. Instead of common location of right kidney below the proximal part of 13th rib to the 2nd lumbar transverse processes (Sisson, 1975), it was found under the transverse process of first and second lumbar vertebrae. However, the left kidney was located below the second, third and fourth lumbar vertebrae. The costal abnormalities were usually secondary to malformation of the vertebral column or sternum. Absent or fused ribs corresponded to absent or fused vertebrae and might accompanied scoliosis (Palmer, 1993). Total absence of a single or several ribs is uncommon. It was generally associated with other skeletal abnormalities of the vertebral column, such as lateral wedge vertebrae, fusion of the vertebral bodies, and other variations which pointed out the close embryological developmental relationship between vertebral bodies and ribs (Ehrenhaft, 1943). But in this case there were no such skeletal deformities other than complete absence of single vertebrae. Absence of last pair of rib was a developmental anomaly. This study will add scientific facts in the teratology of goat.

REFERENCES