

Ultrasonography Of Jugular Vein, Carotid Artery and Thyroid Glands in Native Korean Cattle

Myung-cheol Kim¹ and Hong-sup Byun

College of Veterinary Medicine, Chungnam National University, Taejon 305-764, Korea

한우에서 경정맥, 경동맥 및 갑상선의 초음파상

김명철¹ · 변홍섭

충남대학교 수의과대학

요 약 : 소에서 경정맥, 경동맥 및 갑상선의 초음파상에 관한 기초자료를 확립하기 위하여 본 연구를 실시하였다. 한우 9두에서 6개월령으로부터 12개월령에 도달할 때까지 1개월 간격으로 성장에 따른 경정맥, 경동맥 및 갑상선의 초음파상을 측정하였다. 경정맥, 경동맥 및 갑상선은 경부의 양측에서 관찰하였다. 경정맥의 내경은, 6, 7, 8, 9, 10, 11, 12 및 13 개월령에서, 각각 8.5, 8.7, 8.8, 9.5, 10.0, 10.5, 11.5 및 12.2 mm를 나타내었다. 경동맥의 내경은, 6, 7, 8, 9, 10, 11, 12 및 13 개월령에서, 각각 7.4, 7.5, 8.6, 9.1, 9.4, 9.7, 10.1 및 10.3 mm 이었다. 갑상선엽의 길이는, 6, 7, 8, 9, 10, 11, 12 및 13 개월령에서, 각각 28.0, 32.1, 36.4, 42.2, 51.7, 53.2, 55.1 and 58.8 mm 이었다. 갑상선엽의 높이는, 6, 7, 8, 9, 10, 11, 12 및 13 개월령에서, 각각 13.6, 15.3, 16.1, 20.7, 22.9, 25.6, 28.9 and 29.4 mm를 나타내었다. 본 연구에서의 초음파측정 결과는 한우에서의 경정맥, 경동맥 및 갑상선에서의 형태학적 변화의 진단을 위한 참고자료가 될 수 있을 것으로 사료된다.

Key words : native Korean cattle, ultrasonography, jugular vein, carotid artery, thyroid glands

Introduction

Ultrasonography of jugular vein and carotid artery may be useful for the examination of thrombosis, and neoplasia⁷. Also, ultrasonography of the thyroid is useful in differentiating cyst from solid thyroid lesions and in determining whether lesions are solitary or multiple⁴. Ultrasonography of cattle has been reported for jugular vein^{1,7}, carotid artery², thyroid gland⁴ and spleen^{3,5,8}.

But there have been no reports of ultrasonographic appearance of the jugular vein, carotid artery and thyroid gland in relation to growth in cattle. The present study aims to construct fundamental data on normal ultrasonography for jugular vein, carotid artery and thyroid gland in cattle.

Materials and Methods

Ultrasonographic appearance of jugular vein, carotid artery and thyroid gland according to the growth was determined from 6 to 13 months by monthly examination in 9 native Korean cattle. Cattle were lightly sedated by administration of xylazine (0.1 mg/kg i.m.) before examination.

Jugular vein, carotid artery and thyroid gland were determined on both sides of neck. Ultrasonograms were obtained with 5.0 or 7.5-MHz convex and 5.0-MHz sector transducer. The internal diameter of jugular vein and carotid artery was determined.

Results

The results of examination of the jugular vein and

¹Corresponding author



Fig 3. Ultrasonogram of transverse section through left jugular vein (open arrow) and common carotid artery(closed arrow) from 12 months old native Korean cattle.

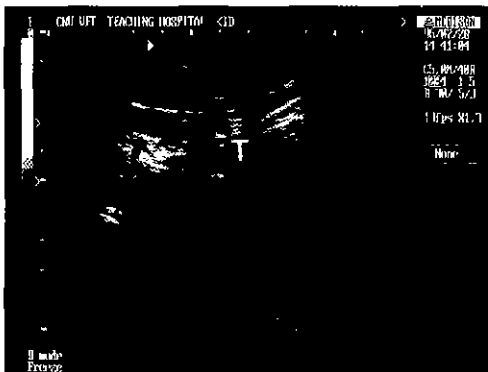


Fig 4. Ultrasonogram of transverse section through left common carotid artery (arrow) and thyroid gland (T) from 12 months old native Korean cattle.



Fig. 5. Ultrasonogram of longitudinal section through left common carotid artery (A) and thyroid gland (T) from 12 months old native Korean cattle. A thin hyperechoic sheath is seen surrounding the thyroid parenchyma.

Discussion

In the bovine, the thyroid gland consists of two flattened triangular lobes connected by a distinct glandular isthmus across the ventral surface of the trachea at the level of the first or second ring. Each lobe measured approximately 8 cm in length and 5 cm in height⁶. In cattle at 13 months, each lobe was determined to be 5.88 cm in length and 2.94 cm in height. The differences may be related to differences of size and body weight between species of cattle.

Balgai¹ reported that repeated catheterization of the jugular vein reveal thickening of the veins with marked hyperechoic areas. In the present study, the jugular vein of cattle revealed uniform wall thickness because there was no repeated catheterization.

Cipone *et al*² reported that the common carotid artery, and the ipsilateral jugular vein of horse appear on ultrasonographic real time two-dimensional examination as anechoic areas with hyperechoic thin walls. The vessels are differentiated by the presence of pulses and by the circular and less collapsible aspect of the artery with respect to the vein. In present study, the diameter of jugular vein was larger than that of carotid artery, and carotid artery revealed pulsation.

Conclusion

The purpose of this study is to construct fundamental information about the ultrasonogram of jugular vein, carotid artery and thyroid gland in cattle.

Ultrasonographic appearance of jugular vein, carotid artery and thyroid gland according to the growth was determined from 6 to 13 months by monthly examination in 9 native Korean cattle. Jugular vein, carotid artery and thyroid gland were determined on both sides of neck.

The internal diameter of jugular vein at the 6, 7, 8, 9, 10, 11, 12 and 13 months old age were 8.5, 8.7, 8.8, 9.5, 10.0, 10.5, 11.5 and 12.2 mm, respectively. The internal diameter of carotid artery at the 6, 7, 8, 9, 10, 11, 12 and 13 months old age were 7.4, 7.5, 8.6, 9.1, 9.4, 9.7, 10.1 and 10.3 mm, respectively. The length of each thyroid lobe at the 6, 7, 8, 9, 10, 11, 12 and 13 months old age were 28.0, 32.1, 36.4, 42.2, 51.7,

53.2, 55.1 and 58.8 mm, respectively. The height of each thyroid lobe at the 6, 7, 8, 9, 10, 11, 12 and 13 months old age were 13.6, 15.3, 16.1, 20.7, 22.9, 25.6, 28.9 and 29.4 mm, respectively.

It is concluded that the ultrasonographic values of this study provides references for the diagnosis of morphologic changes in the jugular vein, carotid artery and thyroid gland in native Korean cattle.

References

1. Bargai U. Ultrasonographic studies on the effect of repeated catheterization of the jugular vein horses. *Veterinary radiology & ultrasound*. 1996; 37: 485.
2. Cipone M, Pietra M, gandin G *et al*. Pulsed wave-doppler ultrasonographic evaluation of the common carotid artery in the resting horse: physiologic data. *Vet Radiol Ultrasound*. 1997; 38: 200-206.
3. Lamb CR, Hartzband LE, Tidwell AS, et al. Ultrasonographic findings in hepatic and splenic lymphosarcoma in dogs and cats. *Vet Radiol*. 1991; 32: 117-120.
4. Miskin M, Rosen IB, Walfish PG. Ultrasonography of the thyroid gland. *Radiol Clin North Am*. 1985; 13: 479-492.
5. Nyland TG, Hager DA and Herring DS. Sonography of the liver, gallbladder, and spleen. *Semin Vet Med Surg (Small Anim)*. 1989; 4: 13-31
6. Sisson S. Spleen. In: *The anatomy of the domestic animals*, 5th ed. Philadelphia: WB Saunders. 1975, 1063-1064.
7. Wing V, Scheible W. Sonography of jugular vein thrombosis. 1983; 140: 333-336.
8. Wrigley RH, Konde LJ, Park RD, *et al*. Ultrasonographic features of splenic lymphosarcoma in dogs: 12 cases (1980-1986). *J Am Vet Med Assoc*. 1988; 193: 1565-1568.