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James W. Van Buren
Iowa State University

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Observations on the Dissection of a Heifer
With Ectopic Cordis

James W. Van Buren*

The heifer (seen alive in November, 1962) appeared in good flesh, and her activity did not seem hampered by her cervical heart. Casual observation revealed that the animal's heart was located between the thoracic inlet and the mid-cervical region. The heart protruded laterally 3-5 cm on either side in the normally loose tissues of the ventral neck. As she stood quietly the heart moved in a craniocaudal direction with each contraction; when she walked, the heart swung from side to side.

NOTES ON THE DISSECTION

Removal of the skin and superficial fascia, transection and reflexion of the right brachiocephalic and sternocephalic muscles, and removal of the deep cervical fascia (containing relatively large amounts of fat) exposed the pericardium. The pericardium formed a tube extending from the thoracic inlet to a point 12-15 cm caudal to the ramus of the mandible (34-36 cm overall). Blunt dissection on the right lateral aspect of the neck revealed the trachea, tracheal duct, vagosympathetic nerve trunk, external jugular vein, and internal jugular vein throughout their course.

The cephalic vein lay superficial to the superficial pectoral muscle and dipped under the caudal portion of the sternocephalicus muscle. The right common carotid artery penetrated the anterior dorsal portion of the pericardium. A relatively large thymus gland lay on the lateral and dorsal portion of the pericardium medial and cranial to the first rib.

The pericardium was removed, the thoracic cavity opened, and dissection completed on the ventral and left sides of the neck.

The heart lay with the base located opposite the first rib and the apex directed cranially (Fig. 1). The ventricles appeared as long cylinders (the left ventricle was approximately 23 cm long), lying parallel and directly beneath the trachea. The aorta arose as a straight caudal continuation of the left ventricle situated on the right ventro-lateral aspect of the trachea until the latter terminated.

The brachiocephalic trunk emerged, at a right angle, from the junction of the aorta and left ventricle. The left brachial artery ran directly toward the left forelimb, giving off its branches in a normal fashion. The brachiocephalic artery curved toward the right, and passed transversely between the middle of the ventricles and the trachea (Fig. 2). The large vessel gave off common carotid arteries on each side of the trachea. The right brachial artery (continuation of the

* Mr. Van Buren is a sophomore in the College of Veterinary Medicine at Iowa State University. The dissection was done in Vet Anatomy 113 laboratory; others involved in the work were D. Adams, D. Ahrensen, D. Brewer, and R. Dayton. Criticism of the manuscript by Dr. D. E. Tyler, Vet Path, is gratefully acknowledged.
Figure 1. Ectopic cordis of a heifer; right ventrolateral view. 1-left ventricle, 2-right ventricle, 3-right atrium, 4-posterior vena cava, 5-pulmonary vein, 6-right venous trunk, 7-trachea, 8-esophagus, 9-left common carotid artery, 10-right common carotid artery, 11-right recurrent laryngeal nerve, 12-vagosympathetic trunk, 13-external jugular vein, 14-internal thoracic artery, 15-brachial artery, 16-brachial vein, 17-internal thoracic vein, 18-apical bronchus, 19-costocervical-vertebral trunk.

Figure 2. Ectopic cordis of a heifer; left ventrolateral view. 1-aorta, 2-left brachial artery, 3-brachiocephalic artery, 4-left common carotid artery, 5-left ventricle, 6-right atrium, 7-posterior vena cava, 8-esophagus, 9-trachea, 10-left venous trunk.
The brachiocephalic artery ran caudal, close to the right ventricle, and gave off the costo-cervical-vertebral trunk in front of the right venous trunk (i.e. common jugular vein).

The right vago-sympathetic nerve trunk passed ventral to the right brachial artery. The right recurrent laryngeal nerve originated under the right brachial artery, curved caudal and dorsally around the artery, and adhered to the trachea as the pair ascended in the neck. The left vago-sympathetic nerve trunk passed ventral to the left brachial artery, and the left recurrent nerve pursued a course similar to the homologous nerve.

The cranial venous drainage converged from either side toward the junction of the post cava and right atrium, as two common jugular veins (as in the chicken). The right tracheal duct emptied into the right common jugular vein.

The pericardium terminated caudally about 3 cm behind the origin of the brachiocephalic trunk. The brachiocephalic artery ran between the fibrous and serous layers of the pericardium until just prior to the origin of the right costo-cervical-vertebral trunk, and was reflected over the left brachial artery for a short distance. The common carotid arteries penetrated the fibrous pericardium only.

The site normally occupied by the heart was completely filled by the lungs. No relative increase in size of the various lobes could be determined but a cranial migration of the lungs was noted. The apical bronchus was given off opposite the first intercostal space while the trachea terminated opposite the cranial edge of the third rib.

Complete dissection of the animal revealed no additional abnormalities.