Clarifications Regarding the Topographical Location of the Vascular, Lymphatic and Nervous Formations from the Thorax Aperture in Dog

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Abstract
Our studies are intended to bring some clarification on the topographic situation of lymphatic vascular and nerve formations in the thoracic aperture to the dog. Data from the literature are less relevant because the other factions by surprise earlier in the mediastinum without to make a correlation between them [6, 7, 8]. The study was performed on 20 corpses of dog different breeds, ages and gender. Vascular formations were injected with a mixture prepare the laboratory of anatomy of the discipline. Photographic paper presents several models dissected setting with as much precision topographic situation of the anatomical formations and has a highly application in human medicine, bringing clarification on topography thoracic duct lymph in the large vessels transport underlying heart. Lymphatic ducts is attached the entire length of the front right mediastinal aorta. That is opening in cranial vena cava without having a secundar channel.

Keywords: mediastinum, lymphatic duct, cranial vena cava, caudal cervical ganglion

1. Introduction
The fundamental research on the topography of the vascular nervous formations from the aperture of the thorax cavity in dog is approached by many researchers, but the data are presented separately, either for the vascular formations, or for the nervous formations, or for the lymphatic formations [1, 2]. These data are a real support to interpret he physiological phenomena and to clarify several aspects regarding the way of approaching the formations during surgery on the anterior mediastinum. The morphology recommend the species as an experimental model. Provided the European legislation of the experimental animals is observed.

2. Materials and methods
The studies were conducted in the laboratory of anatomy of the Faculty of Veterinary Medicine, on 20 dog corpses from our clinic. Before dissecting, the aorta and the veins were injected with a mixture of substances prepared in the laboratory of anatomy. The nervous formations were treated with a solution of acetic acid 10%. The lymph formations were injected with methylene blue. Dissection of interested factions from the cavity aperture cut through the ribs without. The lymphatic anatomy of 10 dog was studied and classified and a new technique for lymphatic cannulation was developed.

3. Results and discussion
Anatomical formations of the dog's chest cavity were presented by many anatomists realized is but an open approach to the thoracic cavity [1, 2, 3]. The main purpose of this study refers to the anatomical formations approach to the thoracic cavity aperture without being sectioned ribs. The team highlighted the formation using this technique in pigs and horses [4]. Surgical approach because of mediastinal anatomical
formations of the dog becomes a practice of more and more frequently require the creation of an experimental model of the anatomic region cranial mediastinum in dogs to supporting practitioners. The data in the literature include information about the nervous system but little information on cranial mediastinal lymphatic of the dog and especially the lymphatic channel [5, 6, 7, 8]. As seen from this brief overview there are a number of uncertainties which are intended to be cleared: if present in dog middle cervical ganglion; if present in dog chance subclaviculara; enlighten some aspects of composition and nomenclature of the caudal cervical ganglia; indication of lymph vegetative and topographic relations of vascular formations at the entrance of the thorax. Regarding the vegetation formations from dog thoracic aperture are some ambiguities concerning the topography, especially for the afferent branch and the efferent. Some authors describe the dog's neck three nodes: one skull, one middle and one posterior, the last two being linked by chance subclaviculare [9]. He also considered that caudal cervical ganglion is formed by attaching paravertebral ganglia T1, T2, T3 and T4.

To elucidate the formation of vegetative ganglia required harvesting and making histological preparations to detect an neuronal body. In all cases the dog was put in evidence the middle cervical ganglion (fig.2). The thoracic viscera are innervated through both the sympathetic and the parasympathetic divisions of the autonomic nervous system. The sympathetic nerves in question arise from the cervical and thoracic sympathetic trunk ganglia. The preganglionic components of these nerves emerge from the spinal cord via the thoracic spinal nerves, traverse the white communicating branch of these nerves and effect synaptic connections in the sympathetic trunk ganglia (Fig.1). The ganglion cells involved in the parasympathetic innervation of the thoracic organs are located in the ganglia of the cardiac and pulmonary plexuses and the intramural ganglia of the respiratory tract and the esophagus. The preganglionic components of the parasympathetic nerves emerge from the brain stem via the vagus nerves (fig.2). Visceral afferent spinal nerve fibers reach the thoracic viscera via the sympathetic nerves. Visceral afferent components of the vagus which supply the thoracic viscera likewise are associated with the parasympathetic nerves.

The cardiac plexus consists of a superficial and a deep portion. The superficial cardiac plexus lies mainly superficial to the pericardium in the concavity of the arch of the aorta. It receives fibers principally via the left superior cervical sympathetic cardiac nerve and the inferior cervical cardiac branch of the left vagus. It includes a small ganglion, the cardiac ganglion of Wrisberg. The deep cardiac plexus consists of two lateral portions joined together by numerous bundles of nerve fibers. The right portion receives fibers via the right superior, middle and inferior cervical and the thoracic sympathetic cardiac nerves and all the cardiac branches of the right vagus. The left portion receives fibers via the left middle and inferior cervical and the left thoracic cardiac nerves and the superior cervical and thoracic branches of the left vagus. It also receives communications from the superficial cardiac plexus. The anterior (right) coronary plexus is made up mainly of fibers derived from the superficial cardiac plexus and the right portion of the deep cardiac plexus. It supplies the right coronary artery and the adjacent cardiac tissues. The posterior (left) coronary plexus is derived mainly from the left portion of the deep cardiac plexus and receives some fibers from the right portion of the deep plexus. It supplies the left coronary artery and adjacent portions of the heart. The efferent innervation of the coronary vessels includes both sympathetic and parasympathetic fibers, but the former are much more abundant than the latter.

Dog, not having similar limphatic anatomy to humans, as we mention to pig. Lymphatic ducts is attached the entire length of the front right mediastinal aorta. That is opening in cranial vena cava without having a secundar channel as specified in pigs (fig.3).

Formation anatomical approach is at chest level as having first milestone coast (fig.4). It protects the right apical pleural recessive and dissect contained septal formations precardiac mediastinal. In relation to the first rib to show the skull mediastinal lymphonodes who are willing and medial to this axilar lymphonode of the first rib that is located in relation to the edge of the skull. Vegetative plexus is located between cervicotoracic formations located superficial venous and arterial located medial formations.
4. Conclusions

1. In all cases dissected was put in evidence the middle cervical ganglion;
2. Cranial cervical ganglion is composed of ganglia paravertebral C7, C8, T1, T2, T3 and T4;
3. The cardiac plexus consists of a superficial and a deep portion;
4. Lymphatic ducts is opening in cranial vena cava without having a secundar channel.

References