

Original article:

Anatomical Variation of the Common Carotid Artery in neck Dissection-observational study

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Abstract:

Introduction: Common carotid arteries chiefly supply the head and neck region. Each common carotid artery bifurcates into external carotid artery (ECA) and internal carotid artery (ICA). According to classical text book description, the carotid arteries run straight in the neck region

Methodology: The present study was conducted in Department of Anatomy for two year duration. 18 in the right and 18 in the left side, of formol-fixed adult cadavers were dissected from Department of Anatomy in routine dissection. The branching pattern variation was observed on the left side of the neck and was unilateral.

Results: In our present study , we found during routine dissection of the neck region of a middle aged female cadaver, the brachiocephalic trunk was found to arise from the arch of the aorta along the left margin of the trachea. The right common carotid arose anterior to the upper trachea and crossed it. The crossing of the upper part of the trachea by the right common carotid artery is a rare occurrence. A more distal branching of the aortic sac during fetal life could explain the anomalous origin of the brachiocephalic trunk. This may lead to an unusual origin and course of the right common carotid artery.

Conclusion: Anatomical knowledge of variations in the origin, course, and branching pattern of the carotid arteries will be useful in angiographic studies, transcatheter embolization procedures.

Introduction:

Common carotid arteries chiefly supply the head and neck region. Each common carotid artery bifurcates into external carotid artery (ECA) and internal carotid artery (ICA). According to classical text book description, the carotid arteries run straight in the neck region (1). Rarely, they show coiling in their course (2). Compared to ECA, ICA more frequently presents such morphological entity (3). Usually, ICA begins at the level of the lamina of the upper border of the thyroid cartilage and enters into the temporal bone. If the distance between these two points is lesser than the vessel length, it leads to coiling, looping and kinking of the vessel (4). However, these conditions are thought to occur due to the benign angiopathy (5) or neurological complications (6) or also considered as congenital anomalies (3). The knowledge of morphological variants of carotid arteries is important while performing procedures such as tonsillectomy, peritonsillar abscess drainage, soft palate impalement injuries, adenoidectomy and velopharyngeoplasty (3). Herein, we report a unilateral variation of both the ECA and ICA in the neck region, and discuss its clinical importance.

Methodology:

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Results:

In our present study, we found during routine dissection of the neck region of a middle aged female cadaver, the brachiocephalic trunk was found to arise from the arch of the aorta along the left margin of the trachea. The right common carotid arose anterior to the upper trachea and crossed it. The crossing of the upper part of the trachea by the right common carotid artery is a rare occurrence. A more distal branching of the aortic sac during fetal life could explain the anomalous origin of the brachiocephalic trunk. This may lead to an unusual origin and course of the right common carotid artery.

Discussion:

The common carotid arteries are present on the left and right sides of the body. These arteries originate from different arteries, but follow symmetrical courses. The right common carotid originates in the neck from the brachiocephalic trunk; the left from the aortic arch in the thorax. These split into the external and internal carotid arteries at the upper border of the thyroid cartilage, at around the level of the fourth cervical vertebra.

The left common carotid artery can be thought of as having two parts: a thoracic (chest) part and a cervical (neck) part. The right common carotid originates in or close to the neck, so contains only a small thoracic portion. There are studies in the bioengineering literature that have looked into characterizing the geometric structure of the common carotid artery from both qualitative and mathematical (quantitative) standpoints.

The average diameters of the common carotids in adult males and females are 6.5 mm and 6.1 mm respectively.

Knowledge of incidence of morphological **variations** in the course and branching of the carotid arteries is important for radiological interpretation and surgical correction when they are symptomatic. Internal **carotid artery** (ICA) is known to show elongation in its extra cranial course. The carotid arterial system which begins from the common carotid arteries (CCAs) is the main arterial supply of the head and neck. Like other arteries in the vascular system, the carotid arteries can become diseased with cholesterol plaque; this condition may result in carotid artery stenosis. Atherosclerosis of the carotid arteries is a major cause of stroke and transient ischemic attack. Plaques typically form in the common carotid artery bifurcation and extend distally into the internal carotid arteries (ICAs) [4].

The carotid arteries and the jugular veins lying anterolaterally in the neck are the major structures commonly injured in penetrating wounds of the neck [2]. The disruption of CCA, ECA and ICA may cause a bleeding that can threaten life [5].

Carotid artery injury is uncommon but not a rare complication of various diagnostic and therapeutic procedures. The consequence of inadvertent carotid artery injury may be quite devastating, but its incidence can be reduced by understanding the mechanisms of injury, i.e., how and when it happens. Properly managing the complication can reduce a patient's mortality and morbidity [6].

Conclusion:

Anatomical knowledge of variations in the origin, course, and branching pattern of the carotid arteries will be useful in angiographic studies, transcatheter embolization procedures.

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