

Bilateral Anomalies of Carotid Vessels and its Clinical Implication.

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During routine dissection of a 91-year old cadaver, bilateral anomalies of the carotid vessels were found including: severe kinking of the left internal carotid artery, variation in the position of the right internal and external carotid arteries, a linguofacial trunk branching from the left external carotid artery and the right external carotid artery exhibited unusual arterial tortuosity. At the time of dissection, another cadaver being dissected had high bifurcation level of the common carotid artery. This sparked the desire to undergo this study as the question was asked: “How often do we see anomalies of the carotid vessels and what is the potential clinical significance of such anomalies as these vessels are critical to blood supply of the brain, neck and head?”

Complete dissection of the right and left neck regions of the cadaver under study, detailed literature review and interviews with physicians were conducted. It was found that anomalies of these vessels are present in approximately 1.2% of cases. More specifically, bilateral anomalies are less frequent than unilateral variations. Furthering the importance of this case study, it was also found that only one other case describes an anteromedial position of the internal carotid artery relative to the external carotid artery and no other cases are described that contain the combination of anomalies found in this study.

Kinking, characteristic of what was present in the left internal carotid artery, would disrupt blood flow to the brain, cause oxygen deprivation leading to serious conditions such as cerebral ischemia and liquefactive necrosis of the brain. The left hemisphere of the brain was found intact and exhibited no such damage. Patient could experience episodes of transient ischemic attacks exacerbated by head and neck rotation but would not cause morphological changes. It has been proposed that the patient developed acquired tortuosity due to long-term hypertensive disease, which is a major cause for left-sided heart failure. The appearance of the heart with hypertrophy of the left ventricle provides basis for a diagnosis of essential hypertension which can ultimately lead to left ventricular failure.

Extreme rotation of the internal and external carotid vessels is believed to have occurred during embryonic development and caused anteromedial positioning of the right internal carotid artery. The presence of this anomaly in this particular case is proposed to have been asymptomatic. The branches of the right external carotid artery arose separately and no anomalies were found regarding the branching. Although the branches of the external carotid artery lie over top of the internal carotid artery, the branching pathways were normal.

The awareness of variation among the carotid arteries is important during the planning and preparation of numerous procedures conducted in the neck region. In this particular case, because the internal carotid artery was pushed closely to the pharynx, the anomaly mainly affects

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surgeries and procedures around or close to the pharynx. This includes: risk during major oropharyngeal tumor resection and less extensive procedures, such as tonsillectomy, adenoidectomy, and uvulopalatopharyngoplasty, incision of peritonsillar abscess. Any such variation of the blood vessels is important to be aware to reduce the risk of error in performing any type of invasive procedure. However, diagnostic procedures are often performed before performing such invasive procedures and aid in eliminating the risk of the surgeon performing such an error.