

Retropharyngeal Course of the Internal Carotid Artery: A Rare Anatomical Variant

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1. Abstract

Several studies have focused on the architectural anomalies and the course of the neck and head vessels. A wide variety of carotid artery malformations have been described. Usually, this type of abnormality is minimally symptomatic. Lack of knowledge of the retropharyngeal route of the internal carotid artery [ICA] can lead to massive bleeding during surgery on the palatine tonsils. We describe in this article the case of a patient who found himself with swallowing disorders of recent onset and in whom the CT scan objectified a retropharyngeal trajectory of the internal carotid arteries.

2. Introduction

Knowledge of human anatomy during the medical training of a doctor or surgeon is the cornerstone for the development of the

correct diagnosis and the implementation of the appropriate treatment. The embryological development of the carotid arteries originates from the aortic arches [2]. They are responsible for the arterial supply of most of the neck and head [1]. Along its cervical route, it can be the subject of several malformations concerning its course or its shape. The retropharyngeal passage of the ACI is one of the abnormalities little recognized by doctors and which can be responsible for a variety of symptoms or serious complications during tonsillar surgery. [3]

3. Case Report

We describe the case of a 61-year-old man who presented with a swallowing disorder without other respiratory or phonatory abnormalities. Cervical oropharyngeal clinical examination without abnormality. Cervicofacial CT showed a left Lobo-isthmian nodule and a retropharyngeal position of the two internal carotid arteries (Figure 1).

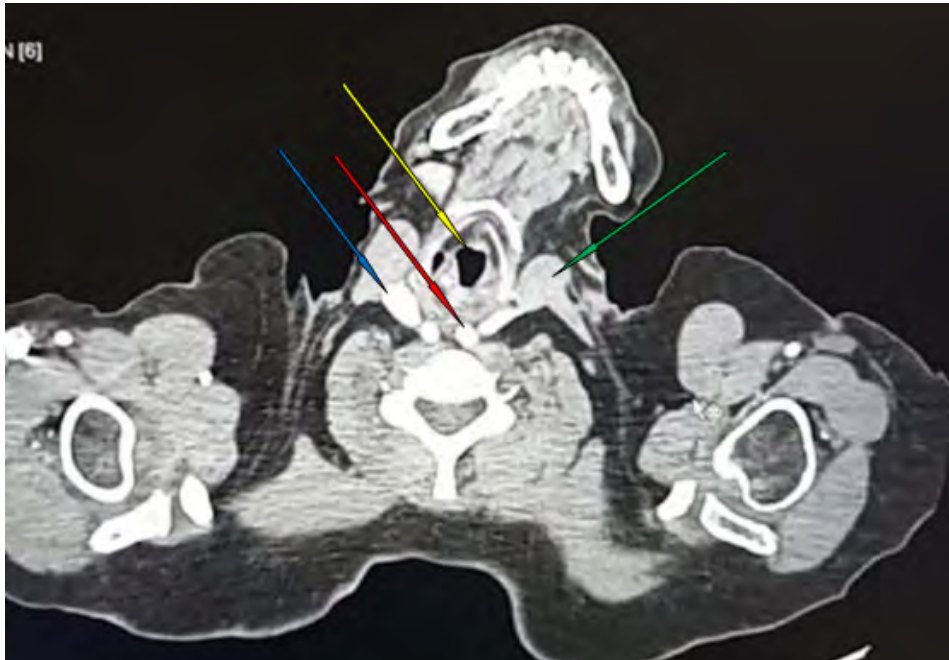


Figure 1: Scannographic axial section showing a retropharyngeal position of the internal carotid arteries.

Red arrow: Left internal carotid

Blue arrow: Right internal jugular vein

Yellow arrow: Supraglottic level

Green arrow: Sterno-cleido-mastoid muscle

4. Discussion

The carotid system has a primary role in the arterial vascularization of most of the face, neck, and brain. The internal carotids arise from the bifurcation of the primitive carotid next to the thyroid cartilage. From an anatomical point of view, the internal carotid arteries have a vertical course of 2 cm, then they converge medially towards the lateral masses of the Atlas bone before entering the cranial box through the carotid canal. [1] In its cervical route, the internal carotid artery is related anteriorly and laterally with essentially three muscles; The digastric, the sterno-cleido-mastoid, the stylo-hyoid, and two arteries; occipital and posterior auricular as well as the glossopharyngeal nerve. Posteriorly, the internal carotid artery comes into contact with the cervical sympathetic trunk and the internal jugular vein. And medially, the internal carotid passes into the space lateral to the pharyngeal wall. During embryonic development, six aortic arches are formed, which appear and regress successively. This alternation of appearance of the aortic arches represents the principle of morphological adaptation of the vascular system during different stages of embryonic development. The supply of the cervical and cranial regions is ensured by the first 3 aortic arches which will form the system of carotid arteries. [2] Disorders of embryonic development can cause malformations in the course or shape of these internal carotid arteries. These malformations are responsible for clinical, radiological, and surgical manifestations. Analysis of approximately 1010 angiograms

showed that rolling and kinking are the most common ICA abnormalities. [4] A tortuous, coiled, retropharyngeal ICA in its cervical course or a hypoplastic ICA may be asymptomatic and found incidentally on radiological examination of the cervical region [5, 6]. However, they can be seen during a laryngoscopic examination or an intubation procedure. [7, 3] Swallowing problems, foreign body sensation in the throat, dyspnea, pharyngeal irritation, and coughing are symptoms that may result from an aberrant route of ICA. Exceptionally, an AVI can be revealed, airway obstruction, dysphagia, or accidentally during tonsillar surgery. [3, 8] Doppler ultrasound is an excellent examination for the exploration of the ICA in its proximal cervical portion, while it is better studied in its pharyngeal and nasopharyngeal course by computed tomography, MRI, and angiography. [9, 10] A study by the team of Calzolari et al, and Vega et al highlighted the importance of spiral CT in the diagnosis of this type of anomaly. [11, 12] Usually, the deformities most often affect the elderly following an attack on the elasticity of the vascular wall. Several etiologies have been implicated in the occurrence of this type of abnormality, including fibromuscular dysplasia, Marfan syndrome, 2q11 deletion syndrome, and autosomal dominant polycystic kidney disease. Other factors suspected to be the causes of wall abnormalities are atherosclerosis, hypertension, and hyperlipidemia. [13, 14] A retropharyngeal or tortuous ICA may be the subject of surgical treatment by resection anastomosis to minimize the risk of ischemic attack. No treatment is mandatory, especially if the condition is asymptomatic. [15]

5. Conclusion

The path of the internal carotid arteries can be the seat of various anatomical anomalies. these variations are generally asymptomatic and poorly understood by clinicians and radiologists. an abnormal retropharyngeal passage of the ACI can manifest itself by swallowing disorders, cough, or even dysphonia. Doppler ultrasound and more specifically cervicofacial CT show these form and route anomalies. knowledge of the anatomical variations of ICAs by surgeons is essential to avoid serious incidents during surgery of the retropharyngeal region.

6. Declarations

6.1. Ethical Approval and Consent to Participate

Not available

6.2. Consent to publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

6.3. Availability of Data and Material

The datasets in this article are available in the repository of the urology database, Chu Ibn-Rochd Casablanca, upon request, from the corresponding author.

6.4. Competing Interests

The authors state that they do not have competing interests.

6.5. Funding

Not applicable

6.6. Author's Contributions

Dr. IJ, Dr. MB, Dr. AM analysed and performed the literature research, Pr. MD, Pr. AD, Pr. RA performed the examination and performed the scientific validation of the manuscript. Issam Jandou was the major contributors to the writing of the manuscript. All authors read and approved the manuscript.

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