

Anomatic Anomalies of the Aortic Arches: Arteria Lusoria Combined with Truncus Bicaroticus

Jandou I^{3*}, Badraoui M³, Moataz A^{1,2}, Mohammed PD^{1,2}, Debbagh PA^{1,2} and Aboutaieb PR^{1,2}

¹University Hospital Center Ibn Rochd Casablanca, Morocco

²Faculty of Medicine and Pharmacy Casablanca, Morocco

³Sharifa-Marrakech Hospital Radiology Department, Morocco

*Corresponding author:

Issam Jandou,
Sharifa-Marrakech Hospital Radiology Department,
Morocco

Received: 26 May 2024

Accepted: 01 July 2024

Published: 06 July 2024

J Short Name: AJSCCR

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Citation:

Jandou I. Anomatic Anomalies of the Aortic Arches: Arteria Lusoria Combined with Truncus Bicaroticus. *Ame J Surg Clin Case Rep.* 2024; 7(15): 1-3

1. Abstract

The aberrant right subclavian artery [ASDA] is one of the most frequent embryological anomalies of the aortic arches, this malformation can be isolated or associated with other cardiovascular and vascular-nervous anomalies. It is usually asymptomatic; however, ASDA may be responsible for dyspnea, dysphagia, or recurrent respiratory infections. Surgical treatment is often indicated in symptomatic forms or aneurysmal complications.

2. Introduction

The aortic arch is a complex structure that can vary enormously. It is the result of the development of six successive aortic arches in time and space. Arteria lusoria is one of the most common anomalies of the aortic arch. It is often associated with other cardiovascular malformations, particularly of the bicarotid trunk [Truncus

bicaroticus]. [1] This anomaly is most often symptomatic. Surgical intervention is warranted in case of recurrent symptoms or risk of aneurysmal rupture. In our study, we describe the fortuitous discovery of an arteria lusoria associated with a bicarotian trunk. [2]

3. Case Report

This is a 58-year-old patient, with no previous illness, who six months ago presented with intermittent hematuria revealing a bladder tumor. An abdominopelvic CT scan, as part of an extensive assessment of his disease, objectified a common origin of the two right and left primitive carotid arteries associated with a right subclavian artery which originates directly from the aortic arch and moves back into the retro-oesophageal space then moves to the right and forwards towards the right axillary hollow (Figure 1, 2).

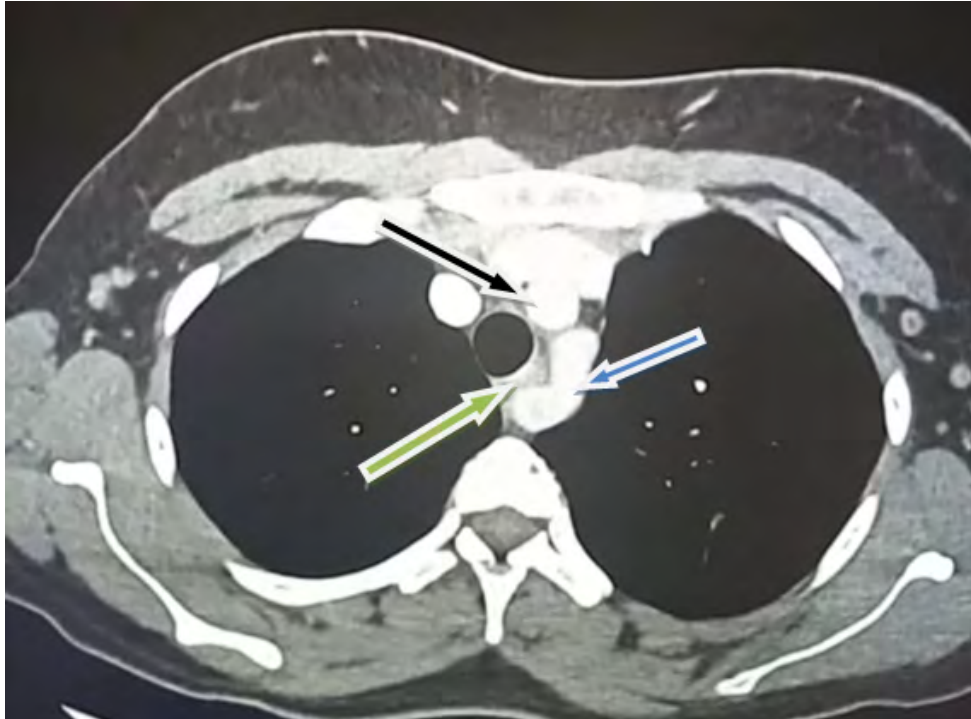


Figure 1: Scannographic axial section showing an arteria lusoria and right bicarotid trunk.
Black Arrow: Bicarotid trunk
Blue Arrow: Right subclavian artery in tracheoesophageal position
Green Arrow: Esophagus

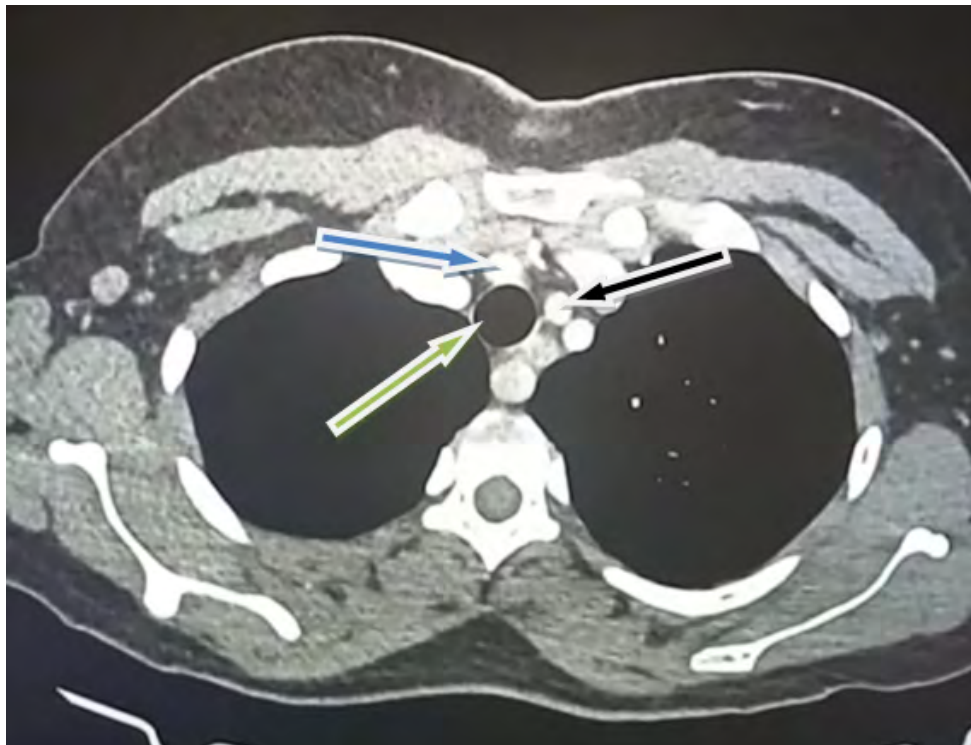


Figure 2: Scannographic axial section showing an arteria lusoria and right bicarotid trunk.
Black Arrow: Right internal carotid artery
Blue Arrow: Left internal carotid artery
Green Arrow: Trachea

4. Discussion

Knowledge of the embryology and anatomy of the aortic arch is essential in the academic training of cardiovascular surgeons, radiologists, and interventional cardiologists. An intervention on the heart and the great vessels most often passes through the aortic arch and these branches. [3] The cervical and thoracic vessels arise from a complex metameric system consisting of the aortic arches and the ventral and dorsal aortas. [4] the aortic arch gives rise to three vessels to supply the upper limbs, the neck, and the head before converting into the descending aorta. Arteria lusoria is one of the most frequent embryological anomalies of the aortic arches. It has a prevalence of about 0.1% to 1% of the general population. A similar aberration is known in mammals. The right subclavian artery originates at the level of the aortic arch, then crosses the midline behind the esophagus in 80% of cases, inter-tracheoesophageal in 15% of situations, and 5% of cases ASDA travels in the pre-tracheal space. [5, 6] The origin of ASDA is usually wider forming a diverticulum commonly called Kommerell's diverticulum. [7, 8] This aberration is often associated with cardiovascular malformations primarily an aberrant right thoracic duct, and also accompanied by a non-recurrent right inferior laryngeal nerve. [9, 10] ASDA is often discovered incidentally and rarely symptomatic. Nevertheless, it can be the cause of dysphagia by compression of the esophagus, dyspnea lusoria by tracheal compression, or even recurrent respiratory infections. Thus the presence of a Kommerell's diverticulum increases the risk of aneurysmal degeneration which remains rare but dangerous. [11, 12, 13] Symptomatic ASDA may require surgery, surgery finds its place as part of the prevention or treatment of the ruptured aneurysm [2].

5. Conclusion

Embryological malformations constitute a wealth of anatomical varieties and a scientific and technical challenge for practitioners. Knowledge of these abnormalities is essential to ensure an adequate diagnosis and rational management. Dysphagia, dyspnea, recurrent respiratory infections, or even ruptured aneurysms can be simple manifestations of ASDA. Surgery is the last resort for doctors in the face of this kind of anomaly.

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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