Scholars Journal of Medical Case Reports

OPEN ACCESS

Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

Arteria Lusoria Associated with a Bicarotid Trunk: Case Report and Review of the Litterature

N. Mennis*, B. Zouita, Y.Zouine, A. Diani, D. Basraoui, H. Jalal

Service Radiologie, Hôpital Mere-enfant, CHU Mohammed VI, Marrakech, Morocco

DOI: 10.36347/sjmcr.2021.v09i07.008 | **Received:** 06.06.2021 | **Accepted:** 09.07.2021 | **Published:** 17.07.2021

***Corresponding author:** N. Mennis

Abstract **Case Report**

Arteria lusoria or retroesophageal right subclavian artery is the most common aortic arch malformation, accounting for 0.5-2.5% of cases. It is mostly aymptomatic, but can also be detected in patients with symptoms such as dyspnea, dysphagia or even recurrent respiratory infections. A combination of an aberrant right subclavian artery (ARSA) and a bicarotid trunk is extremely rare with a prevalence of <0,05% [1]. We present the case of a 3 months old girl who presented with a wheezing dyspnea. She underwent a computed tomography of the chest, and incidental anomalies of the aortic arch branches were found. A symptomatic aberrant right subclavian artery and bicarotid trunk, which was found, are rare and usually incidental findings.

Keywords: Aberrant right subclavian artery, Arteria lusoria, bicarotid trunk, imaging, contrast CT.

INTRODUCTION

The typical aortic arch branching pattern consists of three arteries: brachiocephalic trunk (BCT), left common carotid artery, and left subclavian artery. The BCT is further divided into the right common carotid artery and the right subclavian artery (RSA). There are several variations of these branches that have been described. Arteria lusoria or aberrant right subclavian artery (ARSA) is the most common variation of the aortic branches [2]. In extremely rare cases, it may coexist with a bicarotid trunk. The ARSA is typically asymptomatic and is usually revealed fortuitously by imaging. In most cases, it courses posterior to the trachea and esophagus, and in rare cases, causes symptoms due to compression of these structures [1].

CASE PRESENTATION

A 3 months old girl presented to the ER for a second episode of dyspnea and wheezing without fever. She had a history of respiratory infections. The blood test results were normal. A chest radiograph was also normal. She then had a contrast enhanced chest CT that showed anomalies of the aortic arch branches. The first branch of the aortic arch was a bicarotid trunk, which divides into the right and left common carotid artery (Figure 1, 2). The next branch was the left subclavian artery (Figure 3), and last was an ARSA (Figure 4). It passes posterior to the esophagus and trachea to the right upper limb (Figure 5) and causes a dilatation of the esophagus.

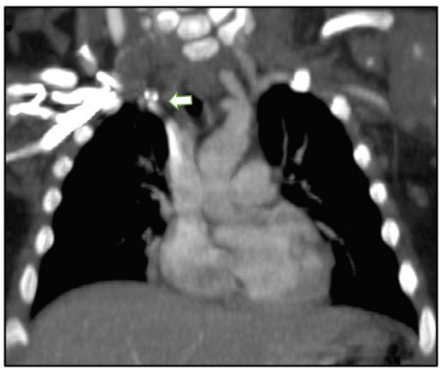

Fig-1: Coronal reconstruction of a chest CT showing a bicarotid trunk (arrow)

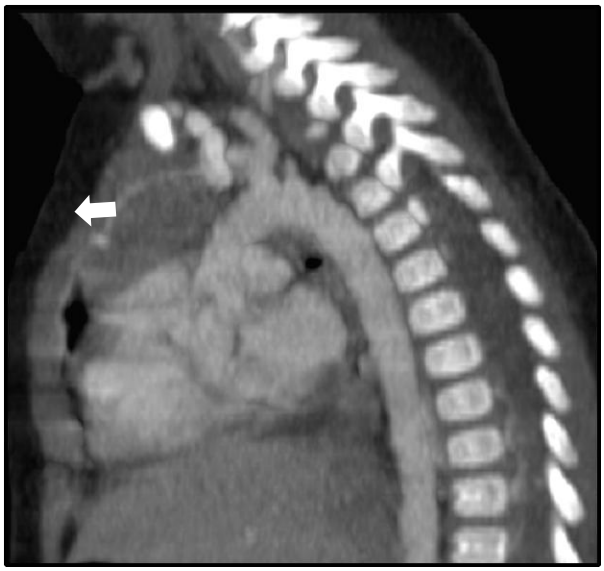

Fig-2: Sagittal reconstruction of a chest CT showing a bicarotid trunk (arrow)

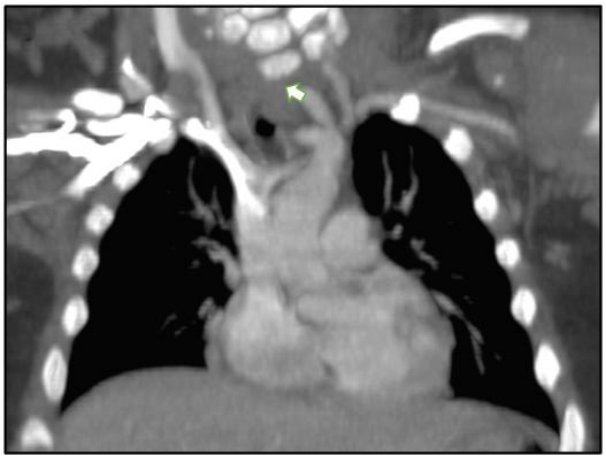

Fig-3: Coronal reconstruction of a chest CT showing the left subclavian artery (arrow)

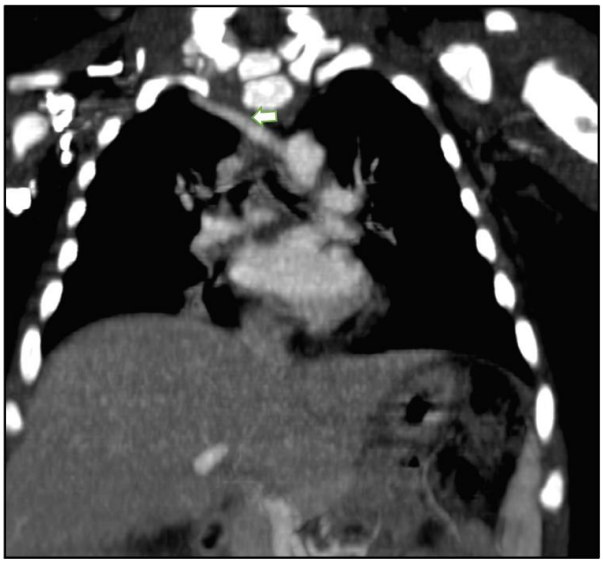

Fig-4: Coronal reconstruction of a chest CT showing the ARSA (arrow)

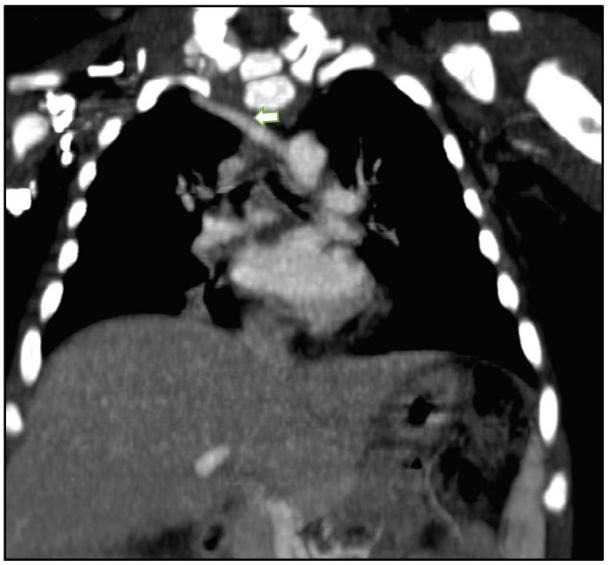

Fig-5: Axial image of a chest CT showing the ARSA passing posterior to the trachea and esophagus (arrow)

DISCUSSION

ARSA was initially described, in 1735 by Hunauld [3]. It is the result of an aplasia of the 4th right aortic arch, compensated by a persistence of the ipsilateral right dorsal aorta. The persistence of the latter, which in the physiological state regresses makes it possible to correct the agenesis of one of the 4 aortic arches. The pathophysiology of this malformation remains unknown and could include a hemodynamic factor in addition to the genetic and evolutionary "background" [4]. On the other hand, a bicarotid trunk develops because of the persistence of the third pair of primitive aortic arch [5].

An ARSA is typically asymptomatic. In cases where bicarotid trunk and ARSA coexist, as it is the case with our patient, symptoms may occur. They can cause restriction to the anterior movement of the trachea and esophagus as they pass anteriorly and posteriorly in relation to these structures [5]. Symptoms may also occur if an aneurysm of the origin of the aberrant vessel is present [6]. The most common symptom is dysphagia due to the retroesophageal course, also clinically termed as dysphagia lusoria [7]. If ARSA passes between the trachea and esophagus, dyspnea may occur. Michal P *et al*. in their study of 141 cases of ARSA found underlying compression by a right arteria lusoria with dyspnea in 18, 7% of cases [8]. In radiological practice, variations of the aortic arch and vessels are often encountered [9].

On the standard radiograph, ARSA appears as opacity of superior mediastinum, in contact with the upper right edge of the aortic arch. Opacification of the esophagus usually reveals an oblique imprint on the upper right side of the esophageal wall. This esophageal

transit is mainly carried out in infants, more rarely in adults.

The gold standard imaging for the evaluation of aortic arch branching variations are contrast CT and magnetic resonance. In cases like ours, they can confirm the diagnosis and offer a detailed visualization of the aortic arch anatomy. The ARSA and bicarotid trunk are often incidental findings during the imaging for other reasons, as it was in our case. We made the diagnosis with the contrast-enhanced CT of the chest, observing a bicarotid trunk arising first from the aortic arch, the second branch was the left subclavian artery, and the third and last was the ARSA, passing to the right behind the esophagus. The MRI, if carried out, easily shows those anomalies, in coronal sections, it highlights a bicarotid trunk and the ARSA. Sagittal sections show the retroesophageal location of the latter.

Therapy for ARSA and bicarotid trunk is usually not required. Endovascular or surgical interventions could be done if it becomes symptomatic either in the presence of dyspnea, chronic respiratory infections, or dysphagia lusoria [10].

CONCLUSION

The combination of ARSA and bicarotid trunk is a rare vascular malformation and is often discovered incidentally. It is asymptomatic in most of the cases but could also cause dyspnea or dysphagia. Its diagnosis should lead the radiologist to look for abnormalities of the heart and large vessels.

REFERENCES

1. Natsis, K., Didagelos, M., Manoli, S. M., Papathanasiou, E., Sofidis, G., & Anastasopoulos, N. (2011). A bicarotid trunk in association with an aberrant right subclavian artery. Report of two cases, clinical impact, and review of the literature. *Folia morphologica*, *70*(2), 68-73.
2. Celikyay, Z. R. Y., Koner, A. E., Celikyay, F., Denız, C., Acu, B., & Firat, M. M. (2013). Frequency and imaging findings of variations in human aortic arch anatomy based on multidetector computed tomography data. *Clinical imaging*, *37*(6), 1011-1019.
3. Hunauld, P. M. (1735). Variétés dans la distribution des vaisseaux. *Hist Acad Roy Sci*, *7*, 20.
4. Louryan, S., & Vanmuylder, N. (2014). Phylogenetic interpretation of aortic arches and outflow tract partitioning. *Morphologie: bulletin de l'Association des anatomistes*, *98*(320), 18-26.
5. Hanžič, N., Čizmarević, U., Lesjak, V., & Caf, P. (2019). Aberrant right subclavian artery with a bicarotid trunk: The importance of diagnosing this rare incidental anomaly. *Cureus*, *11*(11).
6. Thompson, J. L., & Burkhart, H. M. (2016). Translocation of an aberrant right subclavian artery with resolution of dysphagia lusoria. *The Annals of thoracic surgery*, *102*(1), e65-e67.
7. Cummings, M. S., Kuo, B. T., & Ziada, K. M. (2011). A rare anomaly of the aortic arch: aberrant right subclavian artery associated with common carotid trunk. *J Invasive Cardiol*, *23*, E241-E243.
8. Polguj, M., Chrzanowski, Ł., Kasprzak, J. D., Stefańczyk, L., Topol, M., & Majos, A. (2014). The aberrant right subclavian artery (arteria lusoria): the morphological and clinical aspects of one of the most important variations—a systematic study of 141 reports. *The Scientific World Journal*, *2014*.
9. Meena, D. (2014). Aberrant right subclavian artery in association with common trunk of both carotid arteries: Diagnosis with CT. *West Afr J Radiol*, *21*;80-4
10. Ndiaye, K., Abbassi, A., Traoré, S., Vagba, J., Aouami, A., & Berret, M. (2020). Arteria lusoria dyspnéisante: à propos d'un cas [Arteria lusoria causing dyspnea: about a case]. The Pan African medical journal, 37, 318. https://doi.org/10.11604/pamj.2020.37.318.23253.