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Incidental Finding of Arteria Lusoria

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Abstract

The arteria lusoria or retroesophageal right subclavian artery is the most common malformation of the aortic arch. It may be discovered with some symptoms of airway and/or esophageal compression, such as dyspnea or dysphagia, but in most cases it is an asymptomatic pathology. We report a case of a 3 months old patient diagnosed with Down syndrome who was admitted for pulmonary infection with incidental finding of retrooesophageal right subclavian artery.

Keywords

aberrant subclavian artery, arteria lusoria, malformation, retrooesophageal

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Introduction

Known by the name arteria lusoria, the aberrant right subclavian artery (ARSA) is the most prevalent type of aortic arch vascular aberration, occurring in 0.5% to 1.8% of the general population.[1] It may be associated with other congenital anomalies of the heart and great vessels, especially the bicarotid trunk[2] but also with a right-sided aortic arch, and those patients have symptoms more frequently.[3]

Most patients remain asymptomatic and the anomaly is discovered incidentally or it may be discovered during symptoms of airway and/or esophageal compression.[4] We report a case of an aberrant right subclavian artery associated to a left-sided aortic arch discovered on CT scan in a 3 months old patient with Down syndrome.

Case Report

A 3-month-old boy, diagnosed with Down Syndrome, who presented to our department for a thoracic CT scan for cough and fever, dating back a week. It showed consolidation with air bronchogram of the right superior lobe and the medial basal segment of the inferior left lobe, which was compatible with pneumonia explaining the patient's symptoms. Additionally, the scan revealed an abnormal branch coursing behind the esophagus and the trachea, emerging from the distal left aortic arch (Figure 1). This incidental finding is an aberrant right subclavian artery or arteria lusoria. No other vascular abnormalities were detected such as a Kommerell's diverticulum.

Discussion

The aberrant right subclavian artery is the most common anomaly of the aortic arch. It is the first arch anomaly that have been described, in 1735 by Hunauld.[5] Although this abnormality is typically isolated, it can infrequently be linked to other congenital conditions such as carotid or vertebral artery malformations, aortic coarctation, patent ductus arteriosus (PDA), and ventricular septal defect (VSD).[6]

In the structure of arteria lusoria, a left aortic arch gives birth to 4 vessels in order: the right common carotid artery, the left common carotid artery, the left subclavian artery, and the aberrant right subclavian artery. The aberrant right subclavian artery then appears on the left side of the thorax as the final branch of the aortic arch or from the proximal descending aorta, and it must go upward and to the right. It passes behind the esophagus in over 80% of instances, between the esophagus and trachea in 15% of cases, and in front of the trachea in 5% of cases.[1] Aneurismal dilatation, sometimes referred to as Kommerell's diverticulum, is a vascular cause of ARSA that can rupture if treatment is not received.

Embryological variations of the aortic arch are usually asymptomatic. However, they can be complicated by tracheoesophageal symptoms. In the majority of

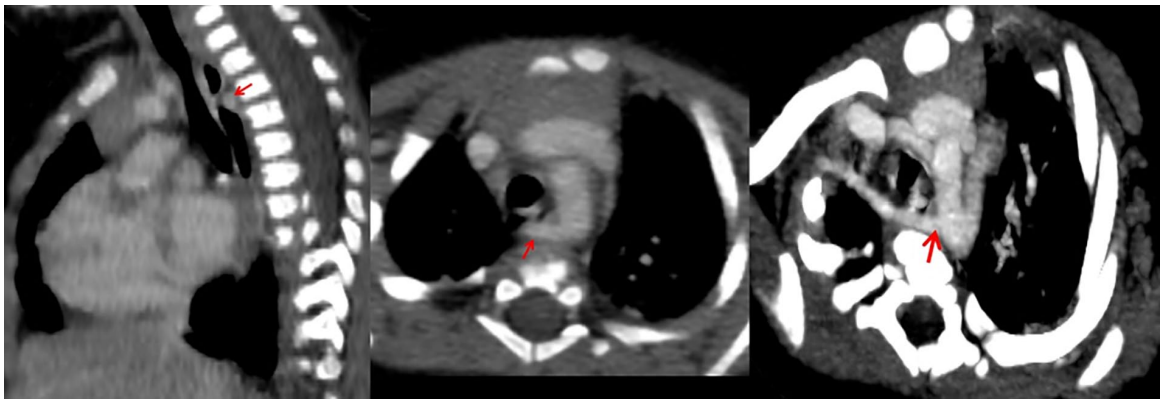

Figure 1. Aberrant artery arising from the distal left aortic arch and coursing behind the esophagus and the trachea.

cases, it is the aberrant retroesophageal right subclavian artery (arteria lusoria) that causes compression of the trachea, which can lead to dyspnea. More rarely, a retroesophageal left subclavian artery will have the same consequences, manifesting dysphagia. Signs may appear late in life, sometimes in adulthood; on the contrary, in infants and young children, vascular rings are more likely to manifest by respiratory symptoms.[4]

Clinically, arteria lusoria is often asymptomatic, as it does not form a complete ring around the trachea. It is usually discovered incidentally during thoracic exploration for other pathologies. Arteria lusoria becomes symptomatic in 3 cases:

- Firstly, when the trachea and esophagus are compressed between the arteria lusoria posteriorly and the bicarotid trunk anteriorly;
- Secondly, when there is an aneurysm of this artery, which is a formidable complication;
- Thirdly, with age, when there is atherosclerotic degeneration of the artery, or of the esophagus. atherosclerotic degeneration of the artery, or the onset of fibromuscular dysplasia.[5]

When ARSA compresses the esophagus, it can causes dysphagia leading to difficulty in swallowing solids and retrosternal pain. Other symptoms such as weight loss, dyspnea or coughing can be caused by tracheal compression.[7]

Multidetector CT angiography (MDCT) and magnetic resonance angiography (MRA) are the gold standards for the initial assessment of thoracic vascular anomalies.[8] Angiographic MDCT is a non-invasive examination that has the advantage of enabling detailed assessment of vascular anomalies and tracheoesophageal compression during the same examination. However, this examination is irradiating and requires the use of iodinated contrast. MRA is an alternative in children, despite the long examination time, the need for patient sedation, possible respiratory and cardiac artifacts, and the poorer study of the esophagus and trachea. It is superior to transthoracic echocardiography, conventional angiocardiography and other magnetic resonance techniques.[9]

In addition, exploration of a symptomatic child usually includes a chest X-ray, echocardiography (to exclude associated intracardiac lesions), bronchoscopy (to demonstrate right anterior compression of the trachea by the right aortic arch, and pulsatile posterior compression by Kommerell's diverticulum). A barium esophageal transit usually identifies the diagonal impression on the posterior surface of the esophagus in the case of an aberrant left subclavian artery. In practice, a barium esophageal transit should be one of the first examinations that needs to be done if a aortic arc anomaly is suspected.[4]

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The majority of people with an aberrant right subclavian artery don't have any symptoms and hardly ever need medical attention. Treatment for dysphagia lusoria is recommended, mainly for children, even though symptoms do not always go away after treatment. Additionally, treatment is recommended to avoid consequences of the aneurysmal dilatation of the lusorian artery.[5] Traditionally, open repair has been regarded as the initial course of care for symptomatic ARSA and aneurysm formation whether or not Kommerell's diverticulum is present. However, the majority of patients can now receive far less invasive treatments thanks to recent advancements in endovascular procedures.[10,11] Despite the increasing popularity of endovascular procedures, several authors continue to support open surgical methods when treating symptomatic ARSA. As of now, dysphagia is the most typical ARSA sign. The pathophysiology of the disease, the patient's overall health, and the surgeon's and center's experience all play a role in the final decision on a certain surgical approach.[10,11]

Conclusion

In conclusion, although arteria lusoria is often asymptomatic, it is important to consider a compression of adjacent structures by this aberrant subclavian artery in front of symptoms such as shortness of breath, retrosternal pain, cough, and weight loss. An early diagnosis involving a barium esophageal transit and MRA or MDCT is necessary to avoid delaying surgical treatment, and to avoid severe complications.

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Author Contributions

CF: Contributed to conception and design; Contributed to analysis; Drafted the manuscript; Gave final approval; Agrees to be accountable for all aspects of work ensuring integrity and accuracy. SE and KM: Contributed to conception and design; Contributed to analysis; Agrees to be accountable for all aspects of work ensuring integrity and accuracy. NA and SE: Critically revised the manuscript; Gave final approval; Agrees to be accountable for all aspects of work ensuring integrity and accuracy. LC: contributed to acquisition, analysis and interpretation, critically revised the manuscript; Gave final approval; Agrees to be accountable for all aspects of work ensuring integrity and accuracy.

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