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Case Report

Dysphagia and Dyspnea: A Rare Diagnosis of Aberrant Right Subclavian Artery

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Abstract

Background: Aberrant right subclavian artery (ARSA), also known as arteria lusoria, is a rare vascular anomaly that can compress adjacent structures such as the esophagus or trachea, leading to symptoms like dysphagia or dyspnea. It is often asymptomatic and incidentally discovered on imaging.

Case Presentation: We report the case of a 27-year-old woman with a well-controlled history of asthma who presented with worsening shortness of breath and progressive dysphagia. Initial treatment targeted a presumed asthma exacerbation. However, persistent symptoms led to further investigation. Chest computed tomography revealed an aberrant right subclavian artery with a retroesophageal course, compressing the esophagus. No other aortic arch anomalies were identified. The patient declined surgical treatment and opted for conservative management after multidisciplinary discussion.

Conclusion: This case highlights the diagnostic challenge of ARSA in young adults, especially when its presentation mimics common respiratory conditions. Cross-sectional imaging plays a pivotal role in identifying the underlying vascular cause of dysphagia and dyspnea.

Keywords: *Aberrant Right Subclavian Artery; Dysphagia Lusoria; Asthma; Vascular Anomaly; Computed Tomography*

Introduction

Aberrant right subclavian artery (ARSA), or arteria lusoria, is the most common congenital anomaly of the aortic arch, with a prevalence of approximately 0.5% to 2%. It typically arises as the last branch of the aortic arch and follows a retroesophageal course to reach the right arm. While most cases are asymptomatic, a subset of patients may present with compressive symptoms-most notably dysphagia (termed dysphagia lusoria) and, less frequently, respiratory complaints such as dyspnea or chronic cough. These symptoms can be particularly misleading when they overlap with more prevalent conditions like asthma.

We report a rare case of symptomatic ARSA in a young woman with a prior diagnosis of asthma, where the vascular anomaly was only revealed after the failure of standard asthma therapy. This case underscores the importance of considering vascular etiologies in patients with unexplained dysphagia and persistent respiratory symptoms despite optimal management of known conditions.

Case Report

A 27-year-old woman with a 10-year history of asthma, managed with regular maintenance therapy, presented to the emergency department with complaints of worsening shortness of breath and difficulty swallowing solids over the past week. Her asthma had been well-controlled until this point, and she had no known history of other respiratory or cardiovascular conditions. Upon admission, she was tachypneic with a respiratory rate of 30 breaths per minute. The rest of the physical examination was unremarkable, with no signs of acute distress other than her respiratory symptoms.

Initial management included oxygen therapy and a consultation with her pulmonologist. Based on her clinical presentation, the pulmonologist diagnosed a moderate asthma exacerbation and recommended systemic corticosteroids in addition to her ongoing asthma treatment regimen. The patient was closely monitored, and her symptoms seemed to stabilize during her hospital stay. However, despite adherence to the treatment plan, the patient returned to the emergency department 15 days later with persistent symptoms. These included ongoing dyspnea, dysphagia, and a new onset of cough, which had not improved with medication. The lack of significant progress prompted further diagnostic workup.

A contrast-enhanced computed tomography (CT) scan of the chest was performed, revealing an aberrant right subclavian artery (ARSA) with a retroesophageal course (Figure 1). This vascular anomaly was causing external compression of the esophagus, likely contributing to the patient's dysphagia and respiratory symptoms. Importantly, no abnormalities were found in the pulmonary parenchyma, which ruled out other potential causes for her symptoms, such as pulmonary infections or exacerbations of her asthma. And with no anomalies in the other major branches of aortic arch.

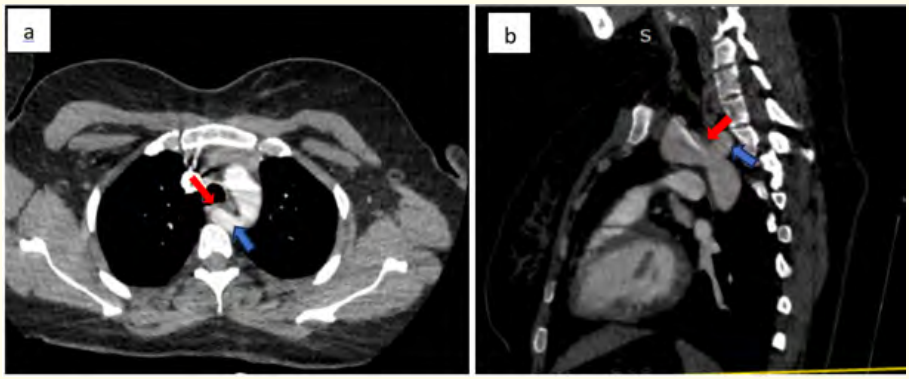

Figure 1: *Thoracic CT angiography, in the mediastinal window on axial section (a) and sagittal reconstruction (b), reveals an aberrant course of the right subclavian artery retroesophageally (blue arrow), causing external compression of the esophagus (red arrow) and resulting in a mild indentation on the trachea.*

After stabilizing her symptoms, the patient was referred to a specialized vascular unit for further evaluation and management of her vascular anomaly. However, when surgical options, including revascularization or endovascular interventions, were discussed, the patient declined any form of operative treatment. She expressed concerns regarding the risks of surgery and preferred to explore alternative management options. Her case was thoroughly discussed with the multidisciplinary team, and she was provided with detailed information about the potential risks and benefits of both surgical and nonsurgical treatments. The patient continues to be monitored for symptom progression, and non-invasive management strategies are being considered.

Discussion

Arteria lusoria is considered aberrant because it does not arise from the brachiocephalic trunk (as it is physiological) but from the aortic arch, laterally to the left subclavian arch. After its origin, the vessel crosses the median line and reaches the right side. As for its location, arteria lusoria can be posterior to the esophagus (80% of cases), between the trachea and esophagus (15% of cases) and anterior to the trachea (in 5% of cases) [1]. The studies indicate that an aberrant right subclavian artery (ARSA), or arteria lusoria, is more frequently observed in women compared to men. Reported incidences show a higher prevalence in women, ranging from approximately 55% to 58%, while in men, it ranges from 42% to 45%. These findings consistently highlight a gender-based difference, with women being more commonly affected. In our study, the patient was also a woman, aligning with these observations [2].

Compression symptoms related to an aberrant right subclavian artery (ARSA) are more commonly observed in older patients, with an incidence of 20% to 40%. Despite this, the majority of cases remain asymptomatic. When symptoms do occur, dysphagia is the most frequently reported, affecting over 90% of symptomatic individuals, while dyspnea is less commonly noted. In elderly patients, these symptoms may be exacerbated due to increased stiffness of the arterial wall caused by conditions such as atherosclerosis, fibromuscular dysplasia, or the formation of aneurysms along the artery's course. Additional manifestations may include cough, retrosternal discomfort, and unintended weight loss [1,2]. In the case of our patient, dysphagia and dyspnea were prominent features, ultimately leading to the diagnosis of ARSA after imaging confirmed the vascular anomaly compressing the esophagus.

An aberrant left subclavian artery (AL) is often found in conjunction with other anatomical variations, including a bicarotid trunk, non-recurrent laryngeal nerve, and right-sided aortic arch. Additionally, it can be linked to various cardiac anomalies, such as aortic coarctation, interrupted aortic arch, tetralogy of Fallot, truncus arteriosus, transposition of the great arteries, and ventricular or atrial septal defects. AL may also be associated with genetic conditions like Down's, Edwards', and DiGeorge syndromes, as well as aneurysms and arterioesophageal fistulas [2]. ARSA arises in distinct patterns from the aortic arch (AA), classified into four types. In type G-1, the ARSA originates as the last branch from the distal portion of the aortic arch, with no anomalies in the other major branches. This pattern corresponds to our patient's anatomy. In type CG-1, the ARSA also arises from the distal aortic arch, but the left vertebral artery additionally branches directly from the arch. Type H-1 involves the ARSA arising alongside a bicarotid trunk, representing a more complex vascular anomaly. Finally, type N-1 is characterized by a right-sided aortic arch, where the left subclavian artery follows a course similar to that of an ARSA. Our patient's presentation aligns with the simpler type G-1 configuration [2,3].

A definitive diagnosis can be established through chest high-resolution computed tomography (HRCT) once other potential causes of dysphagia have been ruled out. In addition, a video fluoroscopic swallowing study can be valuable in the diagnostic process, as it allows for the visualization of extrinsic compression on the thoracic esophagus. This imaging technique can highlight how the esophagus is being compressed from outside, aiding in identifying conditions such as an aberrant right subclavian artery or other anatomical anomalies that may contribute to swallowing difficulties [1]. In our case, a contrast-enhanced chest CT scan performed during the arterial phase allowed for the diagnosis to be made, effectively excluding other conditions that could explain the patient's dyspnea and dysphagia [1].

Dysphagia lusoria is typically managed through a range of treatment options depending on the severity and underlying anatomical causes. Endovascular approaches, such as the use of thoracic endografts, are often employed to resect or bypass the aberrant artery, alleviating compression on the esophagus. In more complex cases, surgical intervention may involve a left thoracotomy to ligate the aberrant left subclavian artery (AL), thus preventing further compression and improving swallowing function. Another option is embolization, where the aberrant vessel is intentionally occluded to reduce the compression on surrounding structures. The choice of treatment depends on the patient's specific condition, including the location and size of the vascular anomaly, as well as overall health considerations [1-3].

Conclusion

This case highlights the diagnostic challenge of ARSA in young adults, especially when its presentation mimics common respiratory conditions. Cross-sectional imaging plays a pivotal role in identifying the underlying vascular cause of dysphagia and dyspnea.

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Statement of Ethics

The patient has consented to publish this case. The study is conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

Patient Consent

Subject have given verbal informed consent to publish the case.

Declaration of Competing Interest

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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