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Aberrant Right Subclavian Artery with Retroesophageal Course as a Reason of Dysphagia: A Case Report

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Report

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ABSTRACT

The most prevalent vascular anomaly of the aortic arch is the aberrant right subclavian artery, which is a rare embryological aberration. It is an anatomical variation of the right subclavian artery, emerging as the last branch of aortic arch. A surgical operation involving the esophagus should take this abnormality into account. Any inadvertent damage to this artery while undergoing surgery has a high risk of death. Even though aberrant right subclavian artery can be difficult to treat during an esophagectomy, if it is identified beforehand, careful dissection of the retroesophageal area during the procedure can help avoid damaging the abnormal artery and its related consequences.

Keywords: Aberrant subclavian artery; dysphagia; dyspnea.

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1. INTRODUCTION

The subclavian artery is located beneath the clavicle. This is a significant artery near the base of the neck since it serves a significant portion of the thoracic wall, head, neck, and brain in addition to serving as the upper limb's major blood supply. At the base of the neck, behind the right sternoclavicular joint, the brachiocephalic trunk gives rise to the right subclavian artery. In the thorax, the left subclavian artery emerges straight from the aortic arch. It runs upwards on the left mediastinal pleura and makes groove on the left lung and enters the neck by passing behind the left stenoclavicular joint. In the neck both the arteries pursue a similar course. On each side, the subclavian artery arches laterally across the anterior surface of the cervical pleura onto the 1st rib posterior to the sclenus anterior muscle. At the outer border of the 1st rib, it ends by becoming axillary artery. However in 0.4% to 1.8% of the general population, it can originate directly from the aortic arch, which is located distal to the left subclavian artery [1-3]. Although most occurrences of aberrant right subclavian artery are asymptomatic, the anomaly may be linked to certain clinical signs as fever, chest discomfort, stridor, dysphagia or both (dysphagia lusoria) and dyspnea [4]. Even in asymptomatic cases, this aberration should be considered in any surgical procedure that may interfere with catheter-based procedures, including esophageal surgical operations like esophagectomy. One's life is seriously at risk if this artery is unintentionally damaged during surgery.

2. CASE REPORT

We report that a 59-year-old woman complained of persistent, steadily increasing chest pain for three months when she first visited our Mount Hope Hospital. Her chest feels heavy, and she is also experiencing progressive dysphagia. Her dysphagia started with solid meals and eventually moved on to liquids. She was unable to swallow any meals or drinks before the presentation, and she would immediately regurgitate. A barium swallow revealed a slight extrinsic mass effect on the upper esophageal posterior aspect. A congenitally abnormal aortic arch with a retroesophageal aberrant right subclavian artery was discovered by CT aortogram (Figs. 1-5). There was no noteworthy personal or family history found.

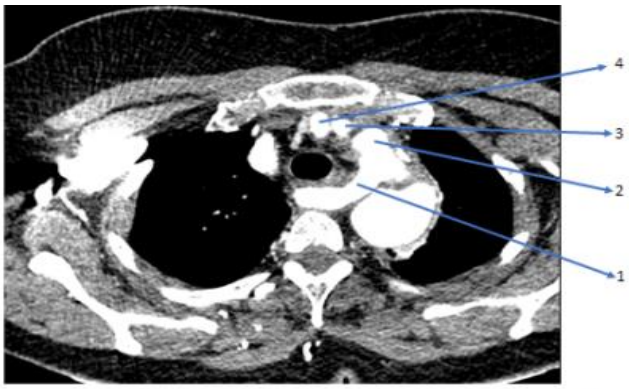
3. DISCUSSION

Arteria lusoria is another name for the anomalous right subclavian artery. With an incidence of between 0.5% and 2.5% in the general population, it is one of the most prevalent aortic arch abnormalities. In 80% of instances, the right subclavian artery begins as the terminal branch of the aortic arch and travels down the right arm after passing through the midline of the body, between the oesophagus and vertebral column and, less frequently, (15% of cases), between the trachea and oesophagus [5]. While some people never have any symptoms, others may experience coughing, pyrosis, dysphagia, dyspnea, acute limb ischaemia, retrosternal discomfort, and even Homer's syndrome [6]. The right subclavian artery, which runs posteriorly, and the right common carotid artery, which is positioned anteriorly, compress the oesogagus, resulting in the clinical signs of arteria lusoria [7].

Normally during embryogenesis, regression of the distal right dorsal aorta occurs leading to the right 4th aortic branch and 7th intersegmental artery becoming the right subclavian artery. On the left side the subclavian artery is derived entirely from the seventh cervical intersegmental artery, which arises from the dorsal aorta opposite the attachment of the fourth arch artery. Aberrant right subclavian artery is caused by the involution of the right 4th aortic branch and proximal right dorsal aorta with a persistent distal right dorsal aorta and 7th intersegmental artery forming the right subclavian artery. This causes the right subclavian artery to originate left of the midline occasionally causing compression. The retroesophageal course of the right subclavian artery behind the oesphagus, although usually asymptomatic, may cause compression and a type of dysphagia know as dysphagia lursoria.

The radiographic results of 25 cases of aberrant right subclavian artery that were first shown on CT were assessed by Hara et al. In 95% of the patients with right retrotracheal subclavian artery, he found that the retrotracheal course of the aberrant artery could result in a posterior tracheal impression, which manifests as a vascular retrotracheal opacity [8]. A case of right retrotracheal subclavian artery producing asthma was reported by Parker et al. [9]. The trachea's anterior displacement from right retrotracheal subclavian artery may be the cause of the asthma. When an angiographer approaches the ascending thoracic aorta via the right axillary,

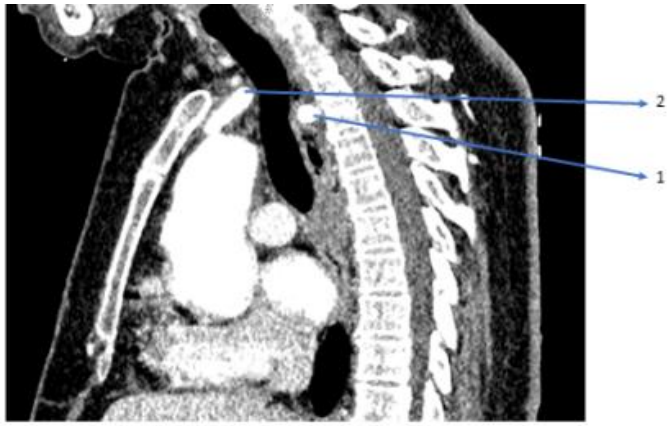
brachial, or radial approaches, right retrotracheal subclavian artery is equally crucial from a clinical standpoint [10 & 11]. When ascending aorta catheterization becomes challenging, the anomalous right subclavian artery may be the cause [12]. The brachiocephalic trunk, the first branch of the aortic arch, allows direct access to the ascending aorta, making it simple to reach it by the right radial artery. However, things change and angiography becomes a difficult task when an aberrant right subclavian artery is present [13].



1. Right Aberrant Subclavian Artery 2. Mid to Distal 1/3rd of Arch of Aorta 3. Left Subclavian Artery 4. Left Common Artery

CT Axial View

Fig. 1. CT aortogram



1.Right Aberrant Subclavian Artery passing behind esophagus 2. Right Common Carotid Artery

CT Sagittal View

Fig. 2. CT aortogram

1.Right Common Carotid Artery

2. Left Common Carotid Artery

3. Left Subclavian Artery

CT Scan Coronal View

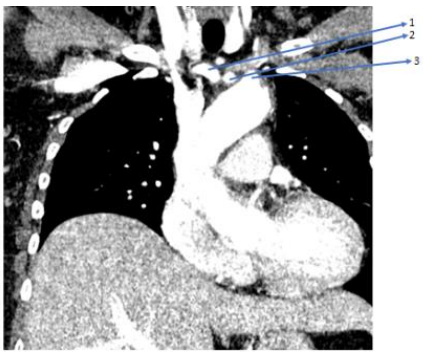
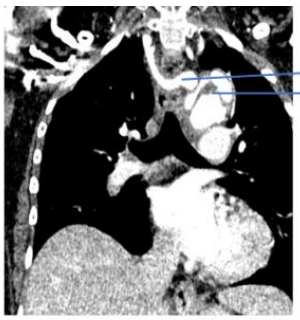


Fig. 3. CT aortogram



1. Aberrant Right Subclavian Artery 2. Aortic Dissection of Distal Arch of Aorta/Proximal Descending Aorta.

CT Scan Coronal View

Fig. 4. CT aortogram

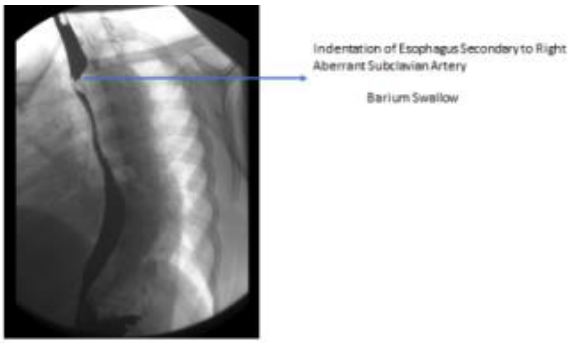


Fig. 5. Barium Swallow

It is well recognized that chromosomal abnormalities, particularly trisomy 21, are linked to aberrant right subclavian artery. According to a recent ultrasonography research, 37.5% of fetuses with Down's syndrome had an aberrant right subclavian artery, when they were between 13 and 26 weeks gestation. Apart from the fact that aberrant right subclavian artery is linked to a higher frequency of intra-cardiac abnormalities, Borenstein et al. report that aberrant right subclavian artery is relatively more common in foetuses with chromosomal disorders, specifically trisomy 21, compared to euploid foetuses. They conclude by saying that right subclavian artery position evaluation is probably going to become a standard ultrasonography diagnostic for chromosomal abnormalities in the second trimester of pregnancy [14 & 15].

4. CONCLUSION

An abnormal right subclavian artery, or arterial lusoria, affects 0.5% to 2.5% of the general population. Mostly asymptomatic, an aberrant right subclavian artery can infrequently result in dysphagia and chest discomfort. Since more and more imaging studies and catheter-based treatments are being performed these days, clinicians dealing with the arch and great vessels should be aware of the presence of aberrant right subclavian arteries in order to lower the risk.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Dandelooy J, Coveliers JP, Van Schil PE, Anguille S. Dysphagia lusoria. CMAJ. 2009;181:498.
2. Hart PA, Karnath PS. Dysphagia lusoria. Mayo Clin Proc. 2012;87:el 7.
3. Pramesh CS, Saklani AP, Parmar V, Acharya S, Badwe RA. Aberrant subclavian arterycausing difficulty in transhiatal esophageal dissection. Dis Esophagus. 2003;16:173-6.
4. Abraham V, Mathew A, Cherian V, Chandran S, Mathew G. Aberrant subclavian artery: Anatomical curiosity or clinical entity. Int J Surg. 2009;7:106-9.
5. Amore D, Casazza D, Casalino A, et al. Symptomatic aberrantright subclavian artery: Advantages of a less invasive surgical approach. Ann Thorac Cardiovasc Surg. 2020;26:104-7.
6. Coles M, Madray VM, Mareddy C, et al. Dysphagialusoria:a vascular etiology? JGH Open. 2020;4:1238-9.
7. Ocaya A. Retroesophageal right subclavian artery: A case report and review of the literature. Afr Health Sci. 2015;15:1034-7.
8. Hara M, Satake M, Itoh M, Ogino H, Shiraki N, Taniguschi H, Shibamoto Y. Radiographic findings of aberrant right subclavian artery initially depictedon CT. Radiat Med. 2003;21:161-65.
9. Parker JM, Gary-Freitas B, Berg BW. Symptomatic vascular rings in adulthood: An uncommon mimic of asthma. J Asthma. 2000;37:275.
10. Abhai‹zhand RK, LoLivard Y, Gobeil OF, Loubeyre C, Lefevre T, Morice MC. The problem of arteria lusoria in radial transradial coronary angiography and angioplasty. Catheter Cardiovasc Interv. 2001;54:196-201.
11. Campeau L. Percutaneous radial approach for coronary angiography. Catñet Cardiovasc Diagn. 1989;16:3-7.

12. Jung Ho Huh, Kook-Jin Chun, Moo Hyun Kim. Overcome the tortuosity from radial artery to subclavian artery-Tips and Tricks, TRI manual. Available:http://www.w-tri.org/images/emanual_0107.PDF
13. Loukas M, Louis RG, Gaspard J, Fudalej M, Tubbs RS, Merds W. A retrotracheal right subclavian artery in association with a vertebral artery and thyroidea ima. Folia Morphol. 2006;65(3):236-41.
14. Zalel Y, Achiron R, Yagel S, Kivilevitch Z. Fetal aberrant right subclavian artery in normal fetuses and in Down syndrome. Ultrasound Obstet Gynecol. 2007;30(4):398.
15. Borenstein M, Minekawa R, Zidere V, Nicolaides K, Allan LD. Aberrant right subclavian artery at 16 to 23+6 weeks of gestation: A marker for chromosomal abnormality. Ultrasound Obstet Gynecol. 2010;36(5):548-52.

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