International Journal of Clinical Case Studies & Reports
IJCCSR, 1(2): 40-42
www.scitcentral.com
ISSN: 2641-5771
Mini Review: Open Access

Rare Case of a Five-Branched Aortic Arch Exhibiting a Retroesophageal Right Subclavian Artery and an Accessory Left Vertebral Artery

Guinevere Granite*

*Department of Surgery, Uniformed Services University of the Health Sciences, Bethesda, MD, USA.

Received March 26, 2019; Accepted April 18, 2019; Published May 19, 2019

ABSTRACT

This is a review of an article presented in the International Journal of Anatomical Variations entitled "Rare case of a five-branched aortic arch exhibiting a retroesophageal right subclavian artery and an accessory left vertebral artery." The case involved a cadaveric specimen who exhibited an aortic arch with five branches: left subclavian artery, a retroesophageal right vertebral artery, right and left common carotid arteries, and an accessory left vertebral artery. Such a combination of five aortic arch vessels may be rare.

Keywords: Retroesophageal right subclavian artery, Aberrant right subclavian artery, Accessory left vertebral artery, Duplicate origin of the left vertebral artery, Vertebral artery variation, Head and neck vascular variations

INTRODUCTION

This article presents a case of a 76 year old White male cadaver who presented with a five-branched aortic arch. The branches included the right common carotid artery (RCCA), left common carotid artery (LCCA), left subclavian artery (LSA), an aberrant right subclavian artery (ARSA); a retroesophageal right subclavian artery (RRSA) and an accessory left vertebral artery (ALVA). Of the types of aortic arch (AA) variations, ARSAs are the most common, with an incidence of 0.1 to 2.5% and more than 100 cases described in the literature [1-30]. However, with the addition of an ALVA serving as the fifth AA branch, this case may highlight a rare variant since its characteristics have not been described in the literature previously.

Several other anatomical variations were present in this case. The left vertebral artery was hypoplastic (diameter<1 mm) and the ALVA exhibited stenosis (diameter ranging between 4 and 5 mm). The circle of Willis had a slightly hypoplastic right posterior communicating artery (PCA) and a markedly dilated left PCA. The right vertebral artery (RVA) was stenotic just before it joined the ALVA to become the basilar artery. The right thyrocervical trunk (TT) arose from a common trunk with the right internal thoracic (mammary) artery (IMA). The right TT was the origin of several RRSA branches: the right transverse cervical artery, right ascending cervical artery (ACA) and the right suprascapular artery. The right inferior thyroid artery was its own branch from the RRSA. The RVA originated from the RCCA instead of the RRSA and the right recurrent laryngeal nerve did not loop around the RRSA. The left inferior thyroid artery was an independent branch, similar to the RRSA, but it originated from a common trunk with the left ACA. Similar to the RRSA, the left TT arose from a common trunk with the left IMA. The left TT branches included the left transverse cervical artery and the left suprascapular artery.

Aortic arch and subclavian branching variations are common and clinically significant in diagnostic imaging and surgical procedures of the head and neck. ARSAs are currently encountered more frequently due to the increasing use of a transradial approach for coronary angiography [31]. They are also important due to their common co-occurrence with a right non-recurrent laryngeal nerve in regards to performing thyroid surgery [2,5,6,8-11,22-25,32,33]. Awareness of RRSA is also significant due to their possible appearance during right axillary, brachial or radial angiographic approaches to the ascending thoracic aorta, and the possibility of a complication with a nearby arterioesophageal fistula [4,6,8-13,15-17,19,22-25,27,29,31,32,34-40]. It is also of clinical note that with this case, there was the presence of an ALVA with a hypoplastic LVA. The hypoplastic LVA that may have been missed if a thorough

Corresponding author: Dr. Guinevere Granite, Department of Surgery, Uniformed Services University of the Health Sciences, Bethesda, MD 20814, USA, Tel: 301-295-1500; E-mail: guinevere.granite@usuhs.edu

Citation: Granite G. (2019) Rare Case of a Five-Branched Aortic Arch Exhibiting a Retroesophageal Right Subclavian Artery and an Accessory Left Vertebral Artery. Int J Clin Case Stud Rep, 1(2): 40-42.

thorough anatomic cadaveric dissection had not been conducted. Awareness of this anatomical variant is important for not only anatomical education purposes, but also essential for radiologists and surgeons examining the head and neck region.

REFERENCES

1. Kanaskar N, Vatslalswamy P, Sonje P, Paranjape V (2014) Retroesophageal right subclavian artery. Adv Anat 2014: 1-3.
2. Lale P, Toprak U, Yagiz G, Kaya T, Uyanik SA (2014) Variations in the branching pattern of the aortic arch detected with computerized tomography angiography. Adv Radiol 2014: 1-6.
3. Chaoui R, Rake A, Heling KS (2008) Aortic arch with four vessels: Aberrant right subclavian artery. Ultrsound Obstet Gynecol 31: 115-117.
4. Atay Y, Engin C, Posacioglu H, Ozyurek R, Ozcan C, et al. (2006) Surgical approaches to the aberrant right subclavian artery. Tex Heart Inst J 33: 477-481.
5. Darwazah AK, Eida M, Khalil RA, Ismail H, Hanbali N (2015) Non-aneurysmal aberrant right subclavian artery causing dysphagia in a young girl: Challenges encountered using supraclavicular approach. J Cardiothorac Surg 10: 92-95.
6. Epstein DA, De Bord JR (2002) Abnormalities associated with aberrant right subclavian arteries: A case report. Vasc Endovasc Surg 36: 297-303.
7. Fazan VPS, Ribeiro RA, Ribeiro JAS, Filho OAR (2003) Right retroesophageal subclavian artery. Acta Circ Bras 18: 54-56.
8. Kieffer E, Bahnini A, Koskas F (1994) Aberrant subclavian artery: Surgical treatment in thirty-three adult patients. J Vasc Surg 19: 100-111.
9. Myers PO, Fasel JHD, Kalangos A, Gailloud P (2010) Arteria lusoria: Developmental anatomy, clinical, radiological and surgical aspects. Ann Cardiol Angeiol 59: 147-54.
10. Abraham V, Mathew A, Cherian V, Chandran S, Mathew G (2009) Aberrant subclavian artery: Anatomical curiosity or clinical entity. Int J Surg 7: 106-109.
11. Polguj M, Chrzanowski Ł, Kasprzak JD, Stefańczyk L, Topol M, et al. (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. Sci World J 2014: 1-6.
12. Corral JS, Zuniga CG, Sánchez JB, Guaita JO, Basail AM, et al. (2003). Treatment of aberrant right subclavian artery aneurysm with endovascular exclusion and adjunctive surgical bypass. J Vasc Interv Radiol 14: 789-792.
13. Freed K, Low VH (1997) The aberrant subclavian artery. AJR Am J Roentgenol 168: 481-484.
14. Khatri R, Maud A, Rodriguez GJ (2010) Aberrant right subclavian artery and common carotid trunk. J Vasc Interv Radiol 3: 33-34.
15. Erdem K, Ozden A, Erkuran MK, Ocak T, Daglar B (2014) Aberrant right subclavian artery (arteria lusoria): A case of symptomatic rupture. IJMSPH 3: 99-101.
16. Kopp R, Wizgall I, Kreuzer E, Meimarakis G, Weidenhagen R, et al. (2007) Surgical and endovascular treatment of symptomatic aberrant right subclavian artery (arteria lusoria). Vascular 15: 84-91.
17. Loukas M, Louis Jr. RG, Gaspard J, Fudalej M, Tubbs RS, et al. (2006) A retrotracheal right subclavian artery in association with a vertebral artery and thyroidea ima. Folia Morphol 65: 236-241.
18. Meena D (2014) Aberrant right subclavian artery in association with common trunk of both carotid arteries: Diagnosis with CT. West Afr J Radiol 21: 80-84.
19. Naqvi SEH, Beg MH, Thingam SK, Ali E (2017) Aberrant right subclavian artery presenting as tracheoesophagial fistula in a 50 year old lady: Case report of a rare presentation of a common arch anomaly. Ann Pediatr Cardiol 10: 190-193.
20. Ocaya A (2015) Retroesophageal right subclavian artery: A case report and review of the literature. Afr Health Sci 15: 1034-1037.
21. Jain KK, Braze AJ, Shapiro MA, Perez-Tamayo RA (2012). Aberrant right subclavian arteryesophageal fistula and severe gastrointestinal bleeding after surgical correction of scimitar syndrome. Tex Heart Inst J 39: 571-574.
22. Rogers AD, Nel M, Eloff P, Naidoo NG (2011) Dysphagia lusoria: A case of an aberrant right subclavian artery and a bicarotid trunk. Int Sch Res Netw 2011: 1-6.
23. Rosa P, Gillespie DL, Goff JM, O'Donnell SD, Starnes B (2003) Aberrant right subclavian artery syndrome: A case of chronic cough. J Vasc Surg 37: 1318-1321.
24. Roszel AJ, Kiely ML (1991) A Retroesophageal right subclavian artery with the right vertebral artery originating from the right common carotid artery. Clin Anat 4: 373-379.
25. Saito T, Tamatsukuri Y, Hitosugi T, Miyakawa K, Shimizu T, et al. (2005) Three cases of retroesophageal right subclavian artery. J Nippon Med Sch 72: 375-382.

26. Schneider J, Baier R, Dinges C, Unger F (2007) Retroesophageal right subclavian artery (lusoria) as origin of traumatic aortic rupture. Eur J Cardiothorac Surg 32: 385-387.

27. Stone WM, Brewster DC, Moncure AC, Franklin DP, Cambria RP, et al. (1990) Aberrant right subclavian artery: Varied presentations and management options. J Vasc Surg 11: 812-817.

28. Tsai IC, Tzeng WS, Lee T, Jan SL, Fu YC, et al. (2007) Vertebral and carotid artery anomalies in patients with aberrant right subclavian arteries. Pediatr Radiol 37: 1007-1012.

29. Tunali S (2016) Subclavian artery. In: Tubbs RS, Shoja MM, Loukas M, eds. Bergman's Comprehensive Encyclopedia of Human Variation, pp: 575-582.

30. Maiti TK, Konar SK, Bir S, Nanda A, Cuellar H (2016) Anomalous origin of the right vertebral artery: Incidence and significance. World Neurosurg 89: 601-610.

31. Allen D, Brews H, Vo M, Kass M, Jassal DS, et al. (2016) Arteria lusoria: An anomalous finding during right transradial coronary intervention. Case Rep Cardiol 2016: 1-3.

32. Mahmodlou R, Sepehrvand N, Hatami S (2014). Aberrant right subclavian artery: A life-threatening anomaly that should be considered during Esophagectomy. J Surg Tech Case Rep 6: 61-63.

33. Adams HL, Kaplan HS (2009) Angiographic interpretation in congenital heart disease. PP: 54-57.

34. Jiang XH, Zhu XY (2017) Abnormal origin of the right subclavian artery: A case report. Chin Med J 130: 1508-1509.

35. Ma Z, Han J, Li H, Guo K (2018) A unique variation with five branches of the aortic arch. Interact Cardiovasc Thorac Surg 26: 165-166.

36. Bayford D (1974) An account of a singular case of obstructed deglutition. Mem Med Soc Lond 2: 271-286.

37. Kommerell B (1936) Verlagerung des osophagus durch eine abnorm verlaufende Arteria subclavia dextra (Arteria lusoria). Fortschr Rontgenstr 54: 590-595.

38. Bull PG, Denck H (1994) Aberrant right subclavian artery. Eur J Vasc Surg 8: 757-760.

39. Gray VJ (2010) Diagnosing a freak of nature. Student Hospitalist 2010: 1-2.

40. Feugier P, Lemoine L, Gruner L, Bertin-Maghit M, Rousselet B, et al. (2003) Arterioesophageal fistula: A rare complication of retroesophageal subclavian arteries. Ann Vasc Surg 17: 302-305.