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Case Report

Arteria Lusoria with Kommerell's Diverticulum Identified during the Evaluation of Dyspnea: A Case Report

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Abstract: Arteria lusoria, also known as an aberrant right subclavian artery (ARSA), is a congenital vascular anomaly of the aortic arch in which the right subclavian artery arises directly from the aorta distal to the left subclavian artery, rather than from the brachiocephalic trunk. This variation, occurring in a small percentage of the population, is frequently associated with a Kommerell's diverticulum, a pouch-like aneurysmal dilation at the origin of the aberrant artery. A recent case at Mohammed VI University Hospital in Oujda involved a 62-year-old patient with exertional dyspnea who underwent thoracic angioscanning for suspected pulmonary embolism, revealing a retro-oesophageal right subclavian artery and a 22 mm Kommerell's diverticulum. In the absence of significant symptoms or complications, a conservative management strategy was chosen, consisting of therapeutic abstention and regular follow-up, with no issues reported to date. Diagnosis is primarily based on thoracic CT imaging, which provides detailed anatomical insights, and treatment varies from observation to surgical or endovascular intervention depending on clinical findings. The management of this anomaly is tailored to each case, considering symptom severity, potential complications, overall health status, and patient preferences.

Keywords: Aberrant Right Subclavian Artery, Kommerell's Diverticulum, CT Imaging.

INTRODUCTION

Arteria Lusoria, also known as an aberrant right subclavian artery (ARSA), is a congenital variation of the aortic arch and its branches, occurring in about 0.5% to 2% of the population [1]. In this condition, the right subclavian artery originates directly from the aorta, distal to the left subclavian artery, instead of coming from the brachiocephalic trunk [2].

This vascular anomaly is often associated with a Kommerell's diverticulum, a rare pouch-like aneurysmal dilation at the origin of an aberrant subclavian artery, whether right or left [3].

Types of ARSA reported in the literature are as follows: retro-oesophageal (80-84%), between trachea and oesophagus (12.7-15%) and pre-tracheal (4.2-5%) [4].

Arteria Lusoria is usually asymptomatic in about 90% of cases because it does not form a complete vascular ring around the oesophageal-tracheal axis. It is most frequently discovered incidentally during imaging studies conducted for other health issues, such as during the evaluation of thoracic or mediastinal conditions [5].

Herein, we present a case in which an aberrant right subclavian artery associated with a Kommerell's diverticulum was incidentally identified during imaging workup for unexplained dyspnea.

CASE PRESENTATION

A 62-year-old woman with a medical history of psoriasis managed with topical corticosteroids for the past 20 years, and a history of undocumented pneumopathy treated with long-acting bronchodilators for 8 years, presented with progressive respiratory symptoms. She reported no significant cardiovascular

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comorbidities, no history of smoking. Her primary complaint was gradually worsening exertional dyspnea over the past 8 years, which initially corresponded to mMRC stage II and had progressed to stage III in the past year. The dyspnea was accompanied by a dry, morning-predominant cough and a sensation of chest tightness. She denied hemoptysis, dysphagia, or wheezing. Additionally, she experienced nocturnal epigastric pain, which responded well to proton pump inhibitors.

On physical examination, the patient was alert and hemodynamically stable, with an oxygen saturation of 98% on room air. There were no signs of cyanosis or respiratory distress. Cardiopulmonary and vascular examinations were unremarkable, with symmetrical pulses and no murmurs or added sounds. Notably, the patient had psoriatic skin lesions at pressure points (elbows and knees) and foot deformities, including hallux valgus, claw toes, and left foot syndactyly (figure 1).

The diagnostic workup included pulmonary function tests, which showed a severe irreversible obstructive ventilatory defect (FEV1 at 37%, Tiffeneau index at 49). Chest radiography revealed signs of thoracic hyperinflation, with widened intercostal spaces on the left and a calcified aortic arch (figure 2). Transthoracic echocardiography showed preserved left and right ventricular systolic function, normal filling pressures, no signs of pulmonary hypertension, and no pericardial effusion.

A thoracic CT angiography was performed due to suspected pulmonary embolism. Although no embolic event was detected, the scan revealed an aberrant right subclavian artery coursing posterior to the oesophagus (Arteria Lusoria), originating from a dilated Kommerell's diverticulum measuring approximately 22 mm in diameter. The scan also identified a left vertebral artery arising directly from the aortic arch (figure 3).

Following a multidisciplinary discussion, a conservative therapeutic approach was adopted. This decision was based on the absence of compressive symptoms or acute complications such as bleeding, infection, or diverticular rupture.

The patient remains under regular outpatient follow-up, and a control CT angiography is scheduled in one year, assuming no clinical signs suggestive of complications emerge.

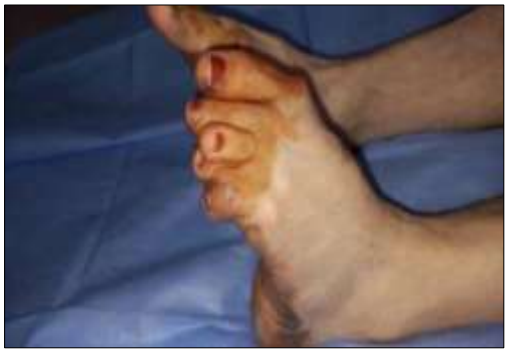

Figure 1: Photograph of the patient's left foot showing syndactyly of the fourth and fifth toes, along with claw toe deformities (image taken at the Vascular Surgery Department of Mohammed VI University Hospital, Oujda)

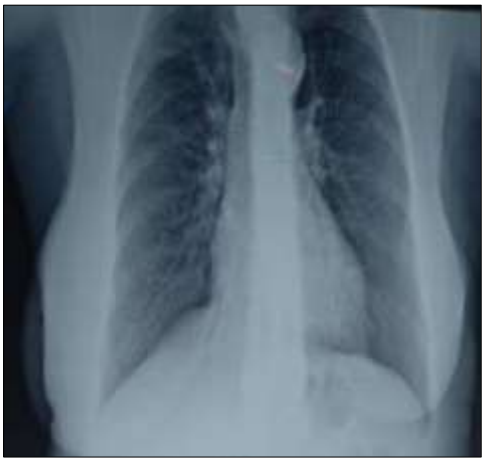

Figure 2: Frontal chest X-ray showing elevation of the right hemidiaphragm and widening of the intercostal spaces (Pulmonology Department, Mohammed VI University Hospital, Oujda

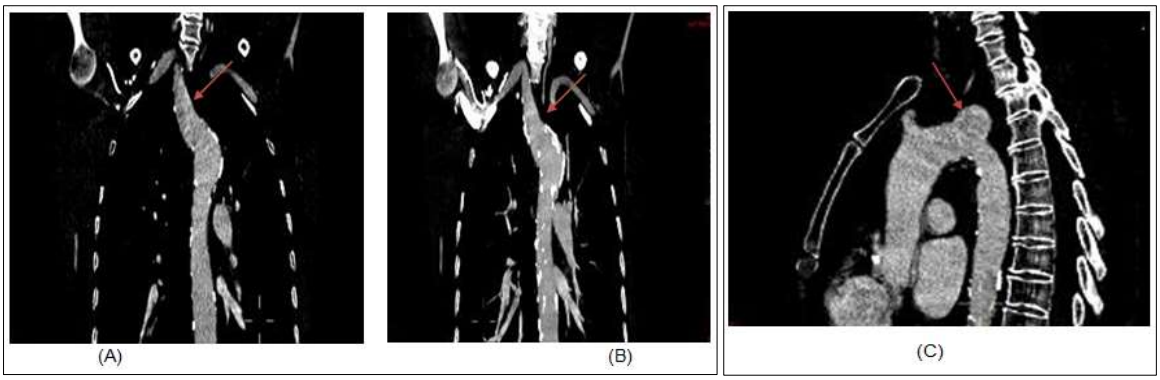

Figure 3: CT angiography: Coronal (A, B) and sagittal (C) reconstructions showing the course of a retroesophageal right subclavian artery with a Kommerell's diverticulum at its origin (Radiology Department, Mohammed VI University Hospital, Oujda)

DISCUSSION

Aberrant right subclavian artery (ARSA) is the most common congenital anomaly of the aortic arch. The cause of this anomaly is believed to be a disturbance in the right fourth pharyngeal arch, which is responsible for developing the innominate artery, along with the persistence of the seventh intersegmental artery [6].

The diverticulum formed by the ARSA, is referred to as Kommerell's diverticulum. In 2012, Backer *et al*., described it as an enlargement at the origin of the subclavian artery measuring more than 1.5 times the diameter of its distal portion [7]. Kommerell's diverticulum can be observed in 20% to 60% of patients with aberrant right or left subclavian arteries [4].

In our case, the patient also presented with a left vertebral artery arising directly from the aortic arch. This anatomical variation is recognized and occurs in approximately 2–4% of cases involving an aberrant right subclavian artery (ARSA) [8]. It is one of several anatomical variants commonly associated with a retroesophageal ARSA.

Interestingly, in our case, arteria Lusoria was incidentally identified during imaging workup for unexplained dyspnea. This aligns with the fact that ARSA is asymptomatic in approximately 90% of cases [5], However, in around 10% of cases, ARSA becomes symptomatic, most commonly due to compression of the trachea or oesophagus, resulting in clinical features such as dysphagia lusoria—difficulty swallowing solids while liquids remain unaffected [9]. Symptoms tend to emerge when the artery develops an aneurysm, when it causes compression between the posteriorly located ARSA and the anterior bicarotid trunk [10], or when age-related degenerative changes such as atherosclerosis or fibromuscular dysplasia are present [11].

In adults, the most frequent symptom is progressive dysphagia to solids, often described as a retrosternal sensation of obstruction. Although respiratory symptoms like dyspnea are less common due to the increased rigidity of the adult trachea [12].

In terms of imaging, CT angiography (CTA) is the gold standard for evaluating aortic arch anomalies and supra-aortic vessels [13]. While earlier diagnosis relied on endoscopy or barium swallow studies, cross-sectional imaging techniques—especially CTA and MRI—are now the primary diagnostic tools [14]. CTA plays a central role in the diagnosis, anatomical evaluation, and follow-up of arteria lusoria, offering detailed visualization of vascular structures and their effect on adjacent tissues. This information is crucial for planning both conservative and surgical treatment strategies. In addition, CTA can help identify associated complications, such as aneurysmal dilatation, stenosis, or other vascular anomalies [15].

Surgical treatment, whether open surgery or endovascular and/or hybrid approach, is always indicated in symptomatic patients. In asymptomatic cases, surgery is indicated when diverticulum size is over 50 mm in the maximum diameter—from the diverticulum wall adjacent to the trachea to the opposite descending aortic wall—and/or when the diameter of the aberrant subclavian orifice exceeds 30 mm [16]. This kind of aneurysm can be treated in a traditional open surgical way or by an endovascular or hybrid approach. Traditional surgery, which involves resecting the diverticulum and reconstructing or relocating the aberrant subclavian artery, is more invasive and carries risks of severe postprocedural complications. Several different approaches have been reported for open surgical treatment, such as left thoracotomy with resection and ligation and an additional carotid-subclavian bypass, resection with primary closure of the orifice, or closure using a polytetrafluoroethylene patch. Median sternotomy using left heart bypass or hypothermic circulatory arrest is another option. Total arch replacements, as well as posterolateral thoracotomic accesses, have also been described [17]. Tanaka *et al*., described postoperative complications such as mediastinitis, chylothorax, respiratory failure, bleeding, nerve injuries, acute pulmonary thromboembolism, and

transient neurological deficits [16]. Procedures involving endovascular exclusion are minimally invasive and generally better tolerated by patients, but they include risks such as endoleak, arterio-oesophageal fistula, and ipsilateral upper extremity claudication [18]. Total percutaneous procedures with custom-designed fenestrated endografts to reconstruct the left carotid artery and the aberrant subclavian artery have also been reported. Considering the hybrid approaches, various interventions such as modified frozen elephant trunk procedures and TEVAR combined with total debranching or subclavian-carotid transposition, depending on the landing zone, are current treatment options [17].

The operative approach to this rare disease remains controversial in the literature due to the lack of large case series, even though a hybrid approach seems to be the best option when feasible. In our case, the diameter of the Kommerell's diverticulum was measured at approximately 22 mm. According to current medical guidelines, intervention is typically recommended for diverticula greater than 30 mm in diameter [19]. As the diverticulum was below this threshold and the patient remained asymptomatic, a conservative approach was chosen, involving regular monitoring to detect any potential symptoms, complications, or increases in diverticulum size that might necessitate future intervention.

CONCLUSION

In conclusion, Arteria Lusoria, or aberrant right subclavian artery, is a complex medical condition resulting from embryological abnormalities in vascular development. Although relatively rare, this anomaly has significant clinical implications and can present with a wide range of symptoms and complications.

Over the years, research and medical advances have led to a better understanding of Arteria Lusoria, including its anatomical variations, clinical manifestations, and available treatment options. Accurate assessment and diagnosis are essential for appropriate management, as symptoms may range from mild discomfort to serious health issues.

Treatment, whether endovascular or surgical, aims to relieve symptoms, prevent complications, and improve patients' quality of life.

REFERENCES

1. J. E. Edwards, « Anomalies of the aortic arch system », Birth Defects Orig Artic Ser, vol. 13, no 3D, p. 47-63, 1977.
2. K. Ndiaye, A. Abbassi, S. Traoré, J. Vagba, A. Aouami, et M. Berret, « Arteria lusoria dyspnéisante: à propos d'un cas », The Pan African Medical Journal, vol. 37, 2020, doi: 10.11604/pamj.2020.37.318.23253.
3. Van Bogerijen, G.H.; van Bogerijen, G.H.; Patel, H.J.; Eliason, J.L.; Criado, E.; Williams, D.M.; Knepper, J.; Yang, B.; Deeb, G.M. Evolution in the Management of Aberrant Subclavian Arteries and Related Kommerell Diverticulum. Ann. Thorac. Surg. 2015, 100, 47–53.
4. Holzapfel G. Ungewo¨hnlicher Ursprung und Verlauf der Arteria subclavia dextra. Anat Hefte. 1899;12(3):369-523. http://dx.doi.org/10.1007/BF02301038.
5. P. O. Myers, J. H. D. Fasel, A. Kalangos, et P. Gailloud, « Arteria lusoria: developmental anatomy, clinical, radiological and surgical aspects », Ann Cardiol Angeiol (Paris), vol. 59, no 3, p. 147-154, juin 2010, doi: 10.1016/j.ancard.2009.07.008.
6. Vucemilo I, Harlock AJ, Qadura M, Guirgis M, Gowing NR, Tittley GJ. Hybrid repair of symptomatic aberrant right subclavian artery and Kommerell's diverticulum. Ann Vasc Surg. 2014;28(2):411-20. http://dx.doi.org/10.1016/j.avsg.2013.04.016. PMid:24200134.
7. Backer CL, Russell HM, Wurlitzer KC, Rastatter JC, Rigsby CK. Primary resection of kommerell diverticulum and left subclavian artery transfer. Ann Thorac Surg. 2012;94(5):1612-7. http://dx.doi.org/10.1016/j.athoracsur.2012.05.101. PMid:22884596.
8. M. Polguj, Ł. Chrzanowski, J. D. Kasprzak, L. Stefańczyk, M. Topol, et A. Majos, « 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 », ScientificWorldJournal, vol. 2014, p. 292734, 2014, doi: 10.1155/2014/292734.
9. F. Jeannon, « Arteria Lusoria: étude morphodensitométrique de 150 cas. Applications cliniques ».
10. A. C. Klinkhamer, « ABERRANT RIGHT SUBCLAVIAN ARTERY: CLINICAL AND ROENTGENOLOGIC ASPECTS », American Journal of Roentgenology, vol. 97, no 2, p. 438-446, juin 1966, doi: 10.2214/ajr.97.2.438.
11. R. E. Gross et P. F. Ware, « The surgical significance of aortic arch anomalies », Surg Gynecol Obstet, vol. 83, p. 435-448, oct. 1946.
12. P. J. Van Rosendael et al., « The Clinical Spectrum of Kommerell's Diverticulum in Adults with a Right-Sided Aortic Arch: A Case Series and Literature Overview », JCDD, vol. 8, no 3, p. 25, févr. 2021, doi: 10.3390/jcdd8030025.
13. « Arteria Lusoria ». Consulté le: 23 septembre 2023. [En ligne]. Disponible sur: https://www.info-radiologie.ch/arteria-lusoria.php
14. J. Harms, T. Vogel, J. Ennker, R. Felix, et R. Hetzer, « Diagnostic evaluation and surgical management of the aberrant right subclavian artery », Bildgebung, vol. 61, no 4, p. 299-303, déc. 1994.
15. A. Türkvatan, F. G. Büyükbayraktar, T. Ölçer, et T. Cumhur, « Multidetector computed tomographic

angiography of aberrant subclavian arteries », Vasc Med, vol. 14, no 1, p. 5-11, févr. 2009, doi: 10.1177/1358863X08097903.

16. Tanaka A, Milner R, Ota T. Kommerell's diverticulum in the current era: a comprehensive review. Gen Thorac Cardiovasc Surg 2015;63:245–59 Epub 2015 Jan 31. PMID: 25636900. doi: 10.1007/s11748- 015- 0521- 3 .
17. Karangelis D, Loggos S, Tzifa A, Mitropoulos FA. The aberrant subclavian artery: approach to management. Curr Opin Cardiol 2020;35:636–42 PMID: 32852349. doi: 10. 1097/HCO.0000000000000793 .
18. Co ¸s kun E, Altınay L, Tekin A, Tütün U. Aberrant right subclavian artery (arteria lusoria) aneurysm with a Kommerell's diverticulum. J Vasc Bras 2019;18:e20180091 PMID: 31236102; PMCID: PMC6579525. doi: 10.1590/ 1677-5449.009118 .
19. A. Tanaka, R. Milner, et T. Ota, « Kommerell's diverticulum in the current era: a comprehensive review », Gen Thorac Cardiovasc Surg, vol. 63, no 5, p. 245-259, mai 2015, doi: 10.1007/s11748-015-0521-3.

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