

# Coincidence of Asymptomatic Aorto-left Atrial Fistula and Aneurysmatic Aberrant Right Subclavian Artery: The Relevance of Multidetector Computed Tomography Angiography

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A 64-year-old female presented to the emergency room complaining of chest pain. An unenhanced thorax computed tomography scan was normal, except for an incidental aneurysmal aberrant right subclavian artery (ARSA). A physical examination indicated that the patient had a blood pressure of 120/80 mmHg and a heart rate of 77 beats/min. The results of routine laboratory tests were unremarkable. Multidetector computed tomography (MDCT) angiography revealed a fistula between the aorta and left atrium, as well as an ARSA with a retroesophageal course coming from the most distal branch of the aortic arch. The fistula was caused by a non-coronary sinus. The fistula measured 3 mm in diameter. There was no evidence of left atrium enlargement (Figure 1). The aneurysmal component of the ARSA was 24 mm in diameter at its origin, and the cross-sectional aortic diameter at the level of the ARSA was 30 mm. Transthoracic and transesophageal echocardiography tests were ineffective in detecting these diseases. There was no further diagnostic evaluation or therapeutic intervention considered. An annual follow-up with thoracic MDCT angiography is recommended.

Fistulas between the aorta and left atrium are extremely rare and are mainly caused by infection, complications of postcardiac surgery, iatrogenic injury, or congenital.<sup>1,2</sup> Congenital aortoatrial fistulas may manifest as aortoatrial tunnels or coronary-americal fistulas. They may be associated with other congenital anomalies, most commonly an atrial septal defect of the ostium secundum.<sup>3</sup> Patients may be asymptomatic or may exhibit symptoms such as exertional dyspnea, dry cough, palpitations, fatigue, chest pain, and even cardiogenic shock.

The aneurysmal ARSA is also a rare aortic arc anomaly. It affects only 0.4-2.0% of the population. When ARSA has an ectatic or aneurysmal origin, it is called a Kommerell diverticulum. Most patients experience no symptoms. However, they could become complicated by tracheal and esophageal compression, aneurysmal dilatation, and aortic dissections.<sup>4</sup> In this case, a thoracic MDCT angiography is required to diagnose the fistula and associated aneurysmal ARSA. Given its speed, non-invasiveness, and diagnostic accuracy, MDCT angiography should be preferred as the primary imaging modality for assessing thoracic vascular and cardiac abnormalities. The main advantages of the MDCT include its widespread availability, fast acquisition time, high spatial resolution, and multiplanar and three-dimensional imaging capability. Its disadvantages include the need for iodinated contrast and ionizing radiation.<sup>5</sup>

Treatment for both diseases should be individualized based on the patient's presentation in terms of the presence of symptoms and complications. Patients with asymptomatic small aorta and left atrium fistula should be closely monitored and treated conservatively with diuretics. Large fistulas must be closed either percutaneously or surgically.<sup>6</sup> Asymptomatic patients with ARSA may not require any intervention and can be safely observed. The treatment of symptomatic patients may require various surgical procedures, and endovascular advancements provide hybrid therapy with less invasive procedures.<sup>7</sup> In this patient with ARSA and an aorto-left atrial fistula that transthoracic and transesophageal echocardiography could not detect, we suggested annual follow-up MDCT angiography.



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Received: September 22, 2023 Accepted: November 14, 2023 Available Online Date: January 03, 2024 • DOI: 10.4274/balkanmedj.galenos.2023.2023-9-69

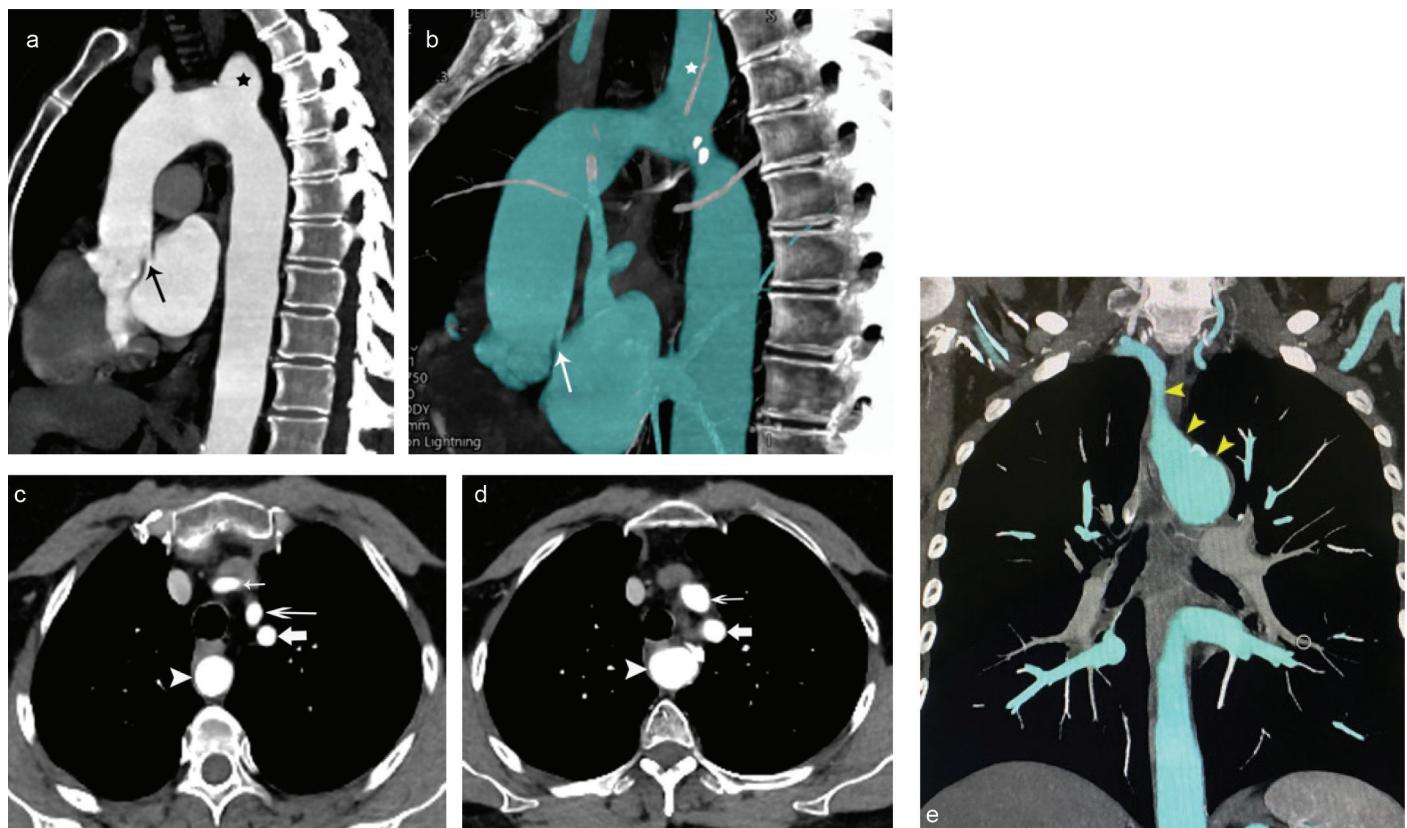
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V.E. 0009-0003-6174-365X.

Cite this article as:

Demir MK, Güler M, Eceraştan Ö, Akıncı O, Eyişler V. Coincidence of Asymptomatic Aorto-left Atrial Fistula and Aneurysmatic Aberrant Right Subclavian Artery: The Relevance of Multidetector Computed Tomography Angiography. *Balkan Med J*; 2024; 41(1):70-1.

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**FIG. 1.** Sagittal reformatted (a) and color-coded volume-rendered (b) computed tomography (CT) angiographic images showing an aorto-left atrial fistula (arrows) and an aneurysmatic aberrant right subclavian artery (ARSA) arising from the most distal branch of the aortic arch (stars). Axial CT angiographic image (c) shows aneurysmatic ARSA (arrowhead), left subclavian artery (thick arrow), and truncus brachiocephalicus (arrow). Axial CT angiographic image (d) shows aneurysmatic ARSA (arrowhead), left subclavian artery (thick arrow), left common carotid artery (long arrow), and right common carotid artery (short arrow). Coronal color-coded volume-rendered CT angiography (e) shows aneurysmatic ARSA (arrows).

**Informed Consent:** Informed consent was obtained from the patient.

**Authorship Contributions:** Concept- M.K.E., M.G., O.A.; Design- M.K.E., M.G.; Data Collection or Processing- M.K.E., M.G., O.A., Ö.E., V.E.; Analysis or Interpretation- M.K.E., M.G., O.A., Ö.E., V.E.; Literature Search- M.K.E., M.G., O.A., Ö.E., V.E.; Writing- M.K.E., M.G., O.A., Ö.E.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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