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Truncus bicaroticus and aberrant right subclavian artery: A rare case mimicking aortic dissection

Truncus bicaroticus ve aberrant sağ subklavyen arter: Aort diseksiyonu taklit eden nadir bir olgu

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The aorta's branching pattern during embryonic development varies significantly. Its basic cylindrical structure gives rise to numerous clinically significant anatomical variations. These variations can cause symptoms or make it challenging to diagnose and treat patients. When imaging the aorta, artifacts caused by heart movement and complex flow patterns can resemble disease, complicating interpretation. Imaging experts need to understand these artifacts to avoid misdiagnosing aortic disease.[1]

A 44-year-old female patient with a history of gastritis arrived at the emergency department with sudden and severe back and chest pain. The patient's blood pressure was equal in both arms. Due to the sudden onset of symptoms and concern for possible heart-related issues, the medical team ordered an electrocardiogram and urgent cardiac blood tests, including troponin. Additionally, contrast-enhanced computed tomography (CT) of the thoracic aorta was performed to search for potential abnormalities. The CT scan revealed multiple anatomical variations in the branches of the aortic arch. Specifically, the common carotid arteries originated from a common trunk, representing the first major branch arising from the aortic arch. Additionally, the aberrant right subclavian artery (ARSA) arose last from the arch, forming a configuration known as a bovine arch (Figure 1). The initial CT scan revealed a flap-like structure in the ascending aorta, which raised concerns about a possible aortic dissection (Figures 2a, b). However, the subsequent echocardiography did not show any abnormalities in the ascending aorta or aortic valve, calling into question the initial interpretation of the CT scan. In response to the patient's ongoing symptoms and inconclusive findings, a repeat CT scan was

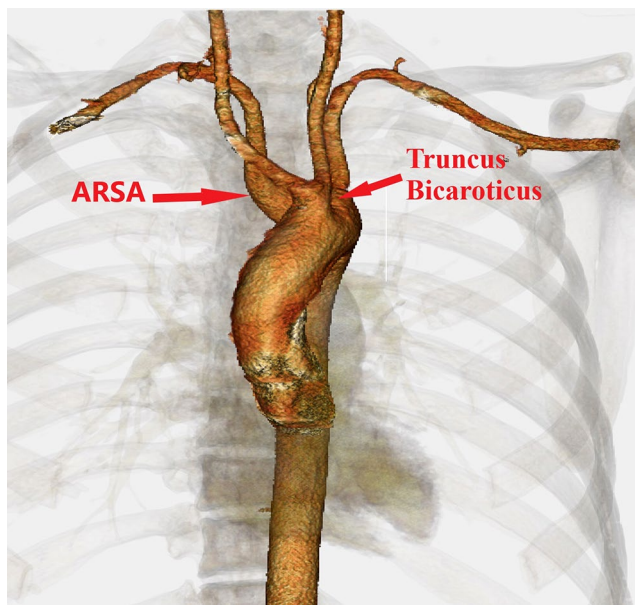

Figure 1. Three-dimensional reconstruction on CT demonstrates truncus bicaroticus (arrow) and ARSA (arrow) arising from the aortic arch.

CT: Computed tomography; ARSA: Additionally, the aberrant right subclavian artery.

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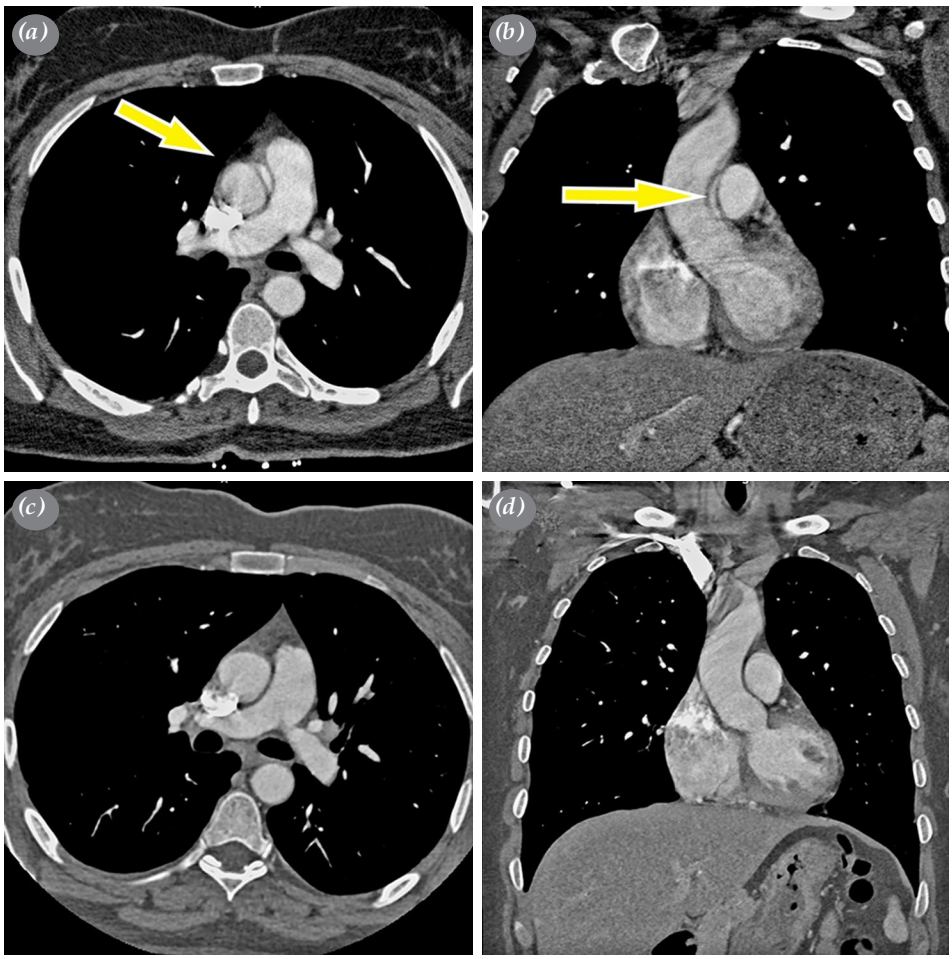

Figure 2. The initial CT angiography showing a flap-like structure (arrows) within the ascending aorta in **(a)** axial and **(b)** coronal sections. In the subsequent CT angiography, the ascending aorta appears normal in **(c)** axial and **(d)** coronal sections.
CT: Computed tomography.

deemed necessary. The subsequent scan did not show the previously observed flap image in the ascending aorta, indicating that the flap image on the initial CT scan was an artifact (Figures 2c, d). A written informed consent was obtained from the patient.

Aberrant right subclavian artery, also known as arteria lusoria, is a well-documented congenital anomaly of the aortic arch system. Although often asymptomatic, ARSA can lead to esophageal compression, resulting in dysphagia, a severe difficulty in swallowing. The embryological basis of ARSA lies in the persistence of atypical aortic arch segments during development. Additionally, the coexistence of truncus bicaroticus, another aortic arch anomaly, with ARSA can worsen swallowing difficulties. This combined effect disrupts normal esophageal motility, presenting a significant challenge to the swallowing process.[2,3]

The patient's symptoms, along with the absence of esophageal compression on imaging, ruled out both typical and atypical presentations of arteria lusoria in this case. Due to the patient's history of gastritis and the potential for the patient's symptoms to originate from the gastrointestinal tract, antacid therapy was initiated, resulting in a subsequent alleviation of symptoms.

This case highlights the challenges of diagnosing aortic dissection. A combination of a rare anatomical variation and potential imaging artifacts closely mimicked classic symptoms, creating a diagnostic dilemma. However, meticulous analysis and the use of additional imaging techniques ultimately led to the

correct diagnosis, preventing unnecessary procedures. This case underscores the critical importance of differentiating true pathology from artifacts, particularly pulsation artifacts on CT, for an accurate aortic dissection diagnosis.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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