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## CASE REPORT

# AN 85-YEAR-OLD–MALE PATIENT WITH TRACHEOESOPHAGEAL COMPRESSION DUE TO A RIGHT-SIDED AORTIC ARCH

### ABSTRACT

An 85 year-old male was admitted to the hospital with shortness of breath and dysphagia. He had a history of exercise-induced asthma and hypertension. Chest x-ray showed bilateral pleural effusions. The patient's clinical and radiological examination results were indicative of congestive heart failure. The patient's complaints did not resolve completely although pleurisy disappeared after optimal diuretic therapy; therefore, magnetic resonance imaging was performed. The scan revealed a right-sided aortic arch with the retroesophageal segment causing tracheoesophageal compression and also disclosed aberrant subclavian artery anomalies with Kommerell's diverticulum. His bronchoscopic examination showed right aortic arch-induced tracheal stenosis in the lower one-third of the trachea and tracheomalacia. To our knowledge, this is the oldest patient reported with symptomatic presentation.

**Key Words:** Asthma; Dyspnea; Deglutition Disorders; Aged; Right Sided Arcus Aorta



## OLGU SUNUMU

# SAĞ YERLEŞİMLİ AORTİK ARKUS NEDENİYLE TRAKEOÖZAFAGİAL KOMPRESYONU OLAN 85 YAŞINDAKİ HASTA

### Öz

85 yaşında erkek hasta nefes darlığı ve yutma güçlüğü şikayetleriyle başvurdu. Hasta egzersizle uyarılan astım ve hipertansiyon öyküsüne sahipti. Göğüs grafisinde bilateral pleural efüzyon saptandı. Hastanın klinik ve radyolojik incelemesi konjestif kalp yetmezliğiyle uyumluydu. Hastanın şikayetleri yeterli diüretik tedavi sonrası pleural sıvının kaybolmasına rağmen tamamiyle düzelmedi, bu nedenle manyetik rezonans görüntüleme yapıldı. Bu inceleme trakeoözafagial bası gösteren retroözafagial segmentli sağ aortik arkus ve ayrıca kommerel divertikülünden gelişen aberran subklavyan arteri ortaya çıkardı. Bronkoskopisinde trakeanın 1/3 alt bölümünde sağ aortik arkudan kaynaklanan trakeal stenoz ve trakeomalazi gözlemlendi. Bilgimize göre, bu olgu bugüne kadar semptomatik prezentasyona sahip olup rapor edilen en yaşlı hastadır.

**Anahtar Sözcükler:** Astım; Dispne; Disfaji; Yaşlı; Sağ Yerleşimli Arkus Aorta.

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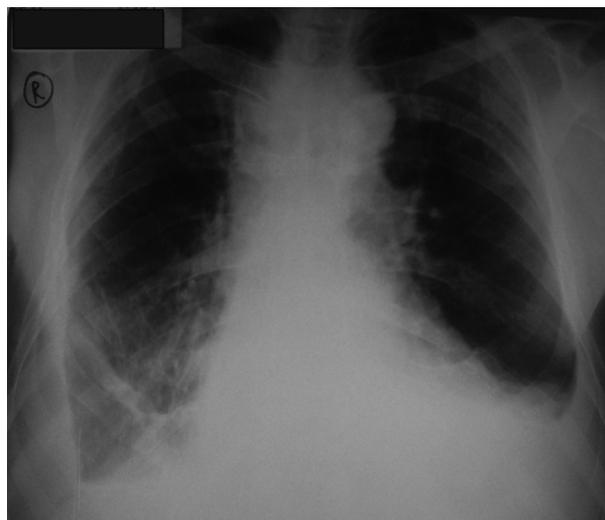


## INTRODUCTION

Congenital anomalies of the aortic arch are rare and are usually diagnosed during childhood. Asymptomatic cases that are not diagnosed in childhood may get incidentally diagnosed decades later (1). Symptomatic aortic arch anomalies are rarely observed in adults (2). Patients with aortic arch anomalies may become symptomatic because of the various static and dynamic changes involved (3). The symptoms caused by these changes are similar to those of asthma, which is associated with such typically intermittent and transient symptoms. Therefore, right aortic arch anomalies are often misdiagnosed as asthma, which delays accurate diagnosis. We report the case of an 85-year-old male patient who had an existing right-sided aortic arch (RAA) and an aberrant left subclavian artery presenting with dyspnea and dysphagia. To our knowledge, this is the oldest patient reported with symptomatic presentation of aortic arch anomalies.

## CASE

An 85-year-old male patient was admitted to our hospital because of dyspnea and dysphagia. He experienced dyspnea and wheezing on effort for 3 years. He was initially diagnosed as exercise-induced asthma and treated with short-acting bronchodilators. During the last 3 days, he complained of dysphagia with solid foods. His medical history indicated that at the age of 20, he had recovered from lung tuberculosis and that he had hypertension for the last 3 years, for which he did not take regular medication. His blood pressure was 170/110 mmHg, and pulse rate was 136 per minute. His heart rate was irregular. During auscultation, breathing sounds could not be heard in the lower zones of both the lungs. The chest radiograph showed accumulation of pleural fluid in both lungs, opacity of the lower zone of the right lung, and upper mediastinal enlargement (Figure 1). Electrocardiography (ECG) revealed atrial fibrillation with a high ventricular response. His pulmonary function test showed a forced expiratory volume ( $FEV_1$ ) of 1.81 L (92%), a forced vital capacity (FVC) of 2.66 (98%), an  $FEV_1/FVC$  ratio of 68%, a forced expiratory flow (FEF) of 50:1.22 (39%), and a peak expiratory flow (PEF) of 4.14 L/s (65%); an expiratory plateau was not observed in the flow-volume curve. His laboratory findings were normal. Pleural fluid analyses revealed transudate. Transthoracic echocardiography showed an increased left atrial diameter (47-mm) and normal left ventricular size with preserved left ventricular systolic function. Diltiazem, acetylsalicylic acid

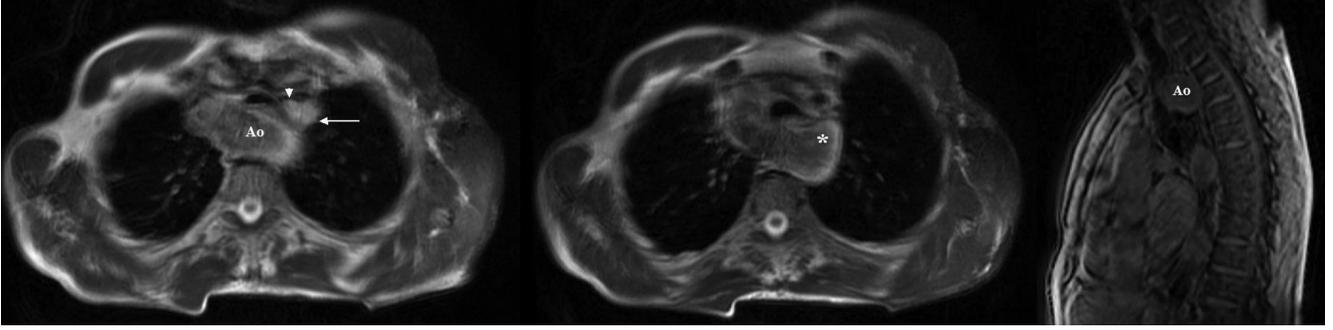


**Figure 1**— Chest x-ray showed pleural fluid in both sides, opacity in the lower zone of the right lung and high mediastinal expansion.

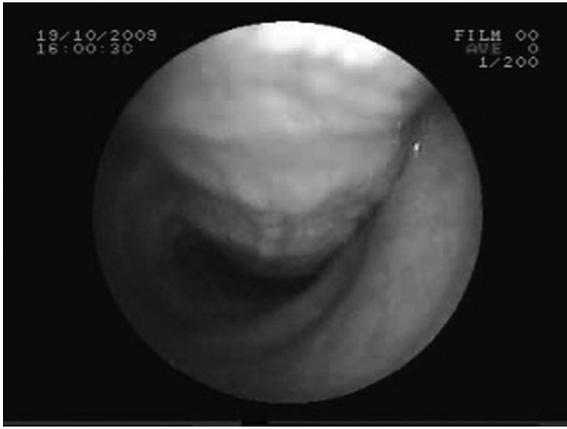
(ASA), and diuretic treatment was started because of atrial fibrillation and diastolic heart dysfunction. This treatment stabilized his heart rhythm from fibrillation to a sinus rhythm, and the pleural fluid disappeared. However, unlike dysphagia, his dyspnea did not improve completely. Therefore, considering also the upper mediastinal enlargement on his chest radiography, magnetic resonance imaging (MRI) of the chest was performed. The scan showed a RAA and an aberrant left subclavian artery that originated from a Kommerell's diverticulum, compressing the trachea and esophagus in the retroesophageal region (Figure 2). Bronchoscopy showed 30% narrowing during expiration in the distal trachea and greater than 50% narrowing during forced expiration (Figure 3). Surgery was suggested on the basis of radiological and bronchoscopic findings and the persistence of dyspnea even after the disappearance of pleurisy; however, the patient did not comply.

## DISCUSSION

An aberrant right-sided subclavian artery and double aortic arch are the most frequently encountered aortic arch anomalies. RAA anomaly comprises 3% of all aortic anomalies observed (4). An RAA has been observed in 0.05–0.1% of radiological series (5) and in 0.04–0.1% of autopsy series (5,6). RAA anomalies are primarily classified according to the nature of the origin of the branches of the arch and then it is subclassified within each type according to whether or not it



**Figure 2—** Magnetic resonance imaging of the chest shows a right-sided aortic arch (Ao) with aberrant origin of the left subclavian artery (arrow) from a diverticulum of Kommerell (asterisk), compressing the trachea and oesophagus posteriorly. The arrow indicates left brachiocephalic vein.



**Figure 3—** After the extraction of lower right 2. molar tooth. Alveolar socket with granulation tissue bordered with infected alveolar bone.

has a retroesophageal segment. Types of right aortic arch branching are as follows: (i) with mirror- image branching of the major arteries; (ii) with an aberrant left subclavian artery; and (iii) with the left subclavian artery isolated from the aorta. The retroesophageal segment is present in 50% of the cases, similar to the aberrant left subclavian artery. Congenital heart disease is encountered more frequently in patients without a retroesophageal segment (7). A saccular aneurysmal dilation at the origin of an aberrant subclavian artery is called as Kommerell's diverticulum. It may cause complications such as rupture or dissection of the aorta.

RAA may present with symptoms or may be found incidentally on chest imaging. Symptoms may result from compression of adjacent thoracic structures such as compression involving the trachea causing dyspnea, wheezing, stridor and cough, compression involving the esophagus causing dyspha-

gia. Respiratory symptoms are more common during childhood, while dysphagia is the most common symptom in adult patients (2). The symptomatic presentation during adulthood despite the absence of symptoms during childhood is probably associated with the degree of airway compression (2). The degree of airway compression is related to the diameter and position of the aorta. The diameter of the aorta increases with age, hypertension, exercise, and fluid treatment. In addition, supine positioning and aortic tortuosity may contribute to the airway compression. In particular, exercise and hypertension exacerbate vague preexisting symptoms that disappear with antihypertensive medication and rest. However, patients may be misdiagnosed as bronchial asthma because of transient and intermittent symptoms. Our patient presented with these symptoms three years earlier along with hypertension, and therefore, he was misdiagnosed as bronchial asthma owing to the exercise-induced wheezing.

The aortic arch and/or aberrant artery are responsible for esophageal compression, thereby causing dysphagia. This condition is called dysphagia lusoria. Tracheoesophageal compression may also result in some complications such as tracheomalacia, gastroesophageal reflux, and recurrent infections. Tracheomalacia, referred to as a weakness of the tracheal wall, is the result of chronic tracheal compression (8). It may disappear with removal of tracheal compression. Chronic tracheal compression and gastroesophageal reflux are the predisposing factors for the development of recurrent infections in such patients.

A chest radiograph is used as the first step for diagnosis in patients with dyspnea and dysphagia. During spirometric examination, the expiratory plateau observed in the flow-volume curve may be a warning sign of tracheal compression. However, it is reported to have quite a low sensitivity for the



diagnosis of central airway obstruction (2,9). Conventional arteriography is considered the gold standard for diagnosis; however, MRI and computed axial tomography (CAT) scans are adequate for confirming the diagnosis. Bronchoscopy can be performed to evaluate the trachea. In our patient, the bronchoscopic examination showed tracheomalacia with 30% tracheal narrowing during expiration and greater than 50% narrowing during forced expiratory breathing.

In conclusion, dyspnea is a common symptom, especially in elderly patients, and often occurs because of pathological condition of the cardiovascular or respiratory system, such as heart failure and chronic obstructive pulmonary disease (COPD). Congenital anomalies are usually not taken into consideration in the differential diagnosis in elderly patients with dyspnea. However, adult patients may have symptomatic anomalies of the aortic arch. Awareness regarding such lesions is important for avoiding unnecessary treatments. MRI and bronchoscopy seem to be appropriate methods for diagnosing these anomalies. Surgery significantly improves the symptoms of most patients. However, if surgery cannot be performed, special attention should be paid to the treatment of hypertension. This report underscores that RAA should be considered during differential diagnosis in patients who present with symptoms of asthma and food intolerance, even in the case of elderly patients.

**Conflict of interest:** None declared.

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