

## Aneurysm of an Aberrant Right Subclavian Artery (Kommerell)- A Rare Phenomenon

### Anormal Sağ Subklavyen Arter Anevrizması (Kommerell) - Nadir Bir Olgu

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#### ABSTRACT

The aberrant right subclavian artery (ARSA) is a rare congenital variant of the aortic arch. When there is present of this aberrant anatomy, the brachiocephalic trunk is usually absent and the right subclavian artery arises as the fourth large arteries from the arch of the aorta. When the ARSA arises from a diverticulum of the distal aortic arch or descending aorta, it is termed as Kommerell aneurysm. Herein, we present a 51 years old man presented with neck pain due to cervical spondylosis. Pre-operative chest x-ray revealed a widened mediastinum. Further computed tomography (CT) of the thorax revealed Kommerell aneurysm of 2.5cm in diameter which does not resulted in any symptoms. We discussed the clinical implications and management of this rare entity in the report.

**Key Words:** Aberrant Right Subclavian Artery, Kommerell, Aneurysm

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#### ÖZET

Anormal sağ subklavyen arter (ARSA) aortik arkın nadir görülen bir konjenital varyantıdır. Bu anormal anatomi mevcut olduğunda, brakiosefalik gövde genellikle yoktur ve sağ subklavyen arter, aort kemerinin dördüncü büyük arterleri olarak ortaya çıkar. ARSA, distal aortik ark veya inen aortun divertikülünden kaynaklandığında Kommerell aneurizması olarak adlandırılır. Burada servikal spondiloz nedeniyle boyun ağrısı ile başvuran 51 yaşında bir erkek hasta sunulmaktadır. Ameliyat öncesi akciğer grafisinde genişlemiş mediasten saptandı. Toraksın bilgisayarlı tomografisinde (BT) 2.5 cm çapında Kommerell aneurizması saptandı ve bu da herhangi bir semptom ile sonuçlanmadı. Bu nadir varlığın klinik sonuçları ve tedavisini raporda tartıştık.

**Anahtar Sözcükler:** Anormal Sağ Subklavyen Arter, Kommerell, Aneurizma

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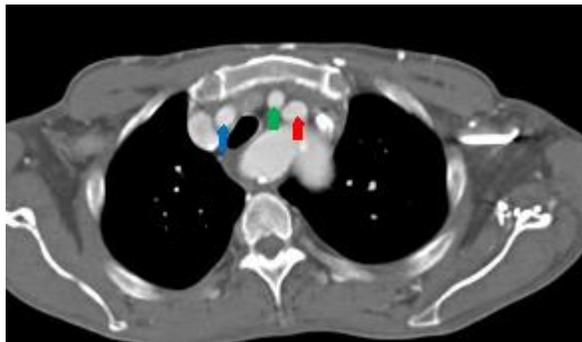
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## INTRODUCTION

The aberrant right subclavian artery (ARSA) also known as 'arteria lusoria', is a congenital variant of the aortic arch and a rare anatomical abnormality. When there is present of this aberrant anatomy, the brachiocephalic trunk is usually absent. The ARSA arises as the fourth large arteries from the arch of the aorta following right and left common carotid artery, and the left subclavian artery. It is termed as Kommerell aneurysm when the ARSA arises from a diverticulum of the distal aortic arch or descending aorta. Herein, we present a case of Kommerell Aneurysm which was incidentally diagnosed during a computed tomography (CT) of the thorax.

## CASE REPORT

A 51-year-old man was found to have a widened mediastinum on chest X-ray imaging during the pre-operative workup for his symptomatic C3-C4, C4-C5 cervical spondylosis. A contrasted computed tomography thorax was then performed which confirmed the presence of an aberrant right subclavian artery with a 2.5cm aneurysm (Figure 1, 2 and 3). He has no compressive symptoms such as dysphagia or shortness of breath. He is being treated conservatively under our surveillance with annual CT thorax angiogram and for early surgical interventions if the vessel size is 3cm or greater.



**Figure 1:** CT axial scan. The anatomical locations of the right (blue arrow) and left carotid (green arrow) and left subclavian (red arrow) arteries.



**Figure 2:** CT axial scan. An aberrant right subclavian artery (blue arrow) located next to the trachea.



**Figure 3:** CT angiogram. A right subclavian diverticulum with a size of 2.5cm in diameter.

## DISCUSSION

Kommerell's diverticulum is a true aneurysm of the aberrant right subclavian artery (ARSA). It is a rare condition however must be treated with high index of suspicion as it tends to rupture(1). It is most common congenital abnormality of the aortic arch and known to be associated with other heart anomalies(2).

This abnormality may be asymptomatic, found coincidentally during autopsy or during diagnostic procedures. Although mostly asymptomatic, the retroesophageal and retrotracheal course of the lusorian artery might result in unspecific thoracic pain, dysphagia, dyspnea, arterioesophageal or arteriotracheal fistulae with hematemesis or hemoptysis, and aneurysmal formation with relevant risk of rupture(3). These symptoms of mediastinal organ compression are due to the course of the large blood vessel within the limited anatomical space.

Symptomatic defects of the aortic arch branches such as ARSA are subjected to surgical treatment during childhood, due to their congenital origin. Any abnormal course of the subclavian artery causing compression deformations within the mediastinum is treated surgically as well. The lusory artery may compress the esophagus and the trachea, which may cause less or more severe ailments of the respiratory system in childhood(4).

The most common reported symptoms were dysphagia (71.2%), dyspnea (18.7%), retrosternal pain (17.0%), cough (7.6%), and weight loss (5.9%). 10% were reported to have compressive symptoms of which if present, is an indication for intervention.

The diverticulum origin may well progress to an aneurysm and with continued expansion, it can lead to dissection and rupture. However, those complications of ARSA aneurysms have been described very rarely so far. To date, there has been no attempt to define the size limits of a "normal" diverticulum. Most of the reported cases of ARSA aneurysms have been "normal" or enlarging diverticula. An average size of this aneurysm, described in the literature, is 3.3 cm (from 2.5 to even 5 cm). An aneurysm of this size, located in the upper mediastinum, usually causes ailments and compression on adjacent organs and predisposes to ruptures(5,6).

There are a variety of surgical approaches with the goal of vascular reconstruction methods have been proposed ranging from conventional open surgery to endovascular and nowadays has progressed to hybrid operation. Open surgery is by cervical approach, median sternotomy, or left- or right-sided thoracotomy, according to the side of the aortic arch.

Chest CT scan is the investigation of choice for a full diagnosis of this vascular anomaly. It visualizes the location and course of the subclavian artery and evaluates the degree of compression on mediastinal organs(5). Resection of the artery through left thoracotomy is a treatment of choice in symptomatic ARSA but translocation and reimplantation of the artery is not recommended. Right thoracotomy was reported and provides good exposure and avoids the morbidity associated with bilateral thoracotomy(7). Rapidly developing modern micro-invasive techniques allow for a resection of the ARSA through video-thoracoscopy, which has the advantage of having a very short recovery time.

As the cases of symptomatic ARSA aneurysm are very rare, there is not one fixed, recommended method of treatment. However, surgical procedures are chosen respectively for every case. Supraclavicular resection of the right subclavian artery, with its translocation to the right side of the aortic arch, is performed while the resection of the arterial aneurysm is performed by left thoracotomy(7). Distal ischaemia and subclavian steal are known complication thus subclavian reconstruction such as an extrathoracic procedure is done before the intrathoracic repair(7). Transbrachial endoluminal stent procedures should be avoided and restricted only to short proximal ostial stenosis(3).

### CONCLUSION

Vascular defects such as the ARSA are rare and aneurysms of these arteries are extremely rare. Computed tomography of the chest is an excellent imaging modality to visualize any vascular anomalies of the arterial branches and also to analyze a potential pathology in these vessels. Treatment modalities of choice include surgery, endovascular and hybrid procedures if it is symptomatic or increasing in size with risk of rupture.

### Conflict of interest

No conflict of interest was declared by the authors.

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