# A rare case of right sided aortic arch with aberrant left subclavian artery

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**ABSTRACT**

A right-sided aortic arch is a rare congenital defect of the aorta. It is seen in approximately 0.1% of population. It is of 3 subtypes some of which are associated with cyanotic congenital heart diasease and some are associated with esophageal and tracheal compression and vertebrobasilar insufficiency. Here we present a case of right sided aortic arch with abberant left subclavian artery originating from kommerell's diverticulum.

**Keywords:** Right-Sided Aortic Arch, Aberrant left Subclavian Artery, Kommerell's diverticulum

## INTRODUCTION

Right-sided aortic arch is a rare anatomical variant present in about 0.1% of the adult population [1,2]. In 1936, Burckhard Friedrich Kommerell first described an aberrant right subclavian artery originating from the descending thoracic aorta of a left-sided arch and associated with persistence of a remanant of the right dorsal aorta.[3] This now called Kommerell's diverticulum consists of both an aneurysm of the thoracic aorta and an aneurismal orifice of the aberrant subclavian artery. Right-sided aortic arch with aberrant left subclavian artery originating from a Kommerell's diverticulum is an uncommon arch abnormality seen in about 0.05% of the general population; it is usually asymptomatic and incidentally detected[4,5]. Symptoms in adults often result from early atherosclerotic changes in the anomalous vessels, and/or dissection or aneurismal dilatation with compression of surrounding structures.

## CASE REPORT

A 45years old male patient was referred to cardiology out patient department for routine fitness to surgery. The patient is completely asymptomatic. Complete physical examination did not reveal any abnormality. Chest X-ray (Figure-1) showed absence of left aortic contour and soft tissue indentation on right side of distal trachea. CT angiography (Figure -2) showed left common carotid artery arising as a first branch from ascending aorta. The second branch is right common carotid artery arising at the junction between ascending aorta and the arch of aorta. So there is no brachiocephalic trunk. The third is the right subclavian artery arising separately from the arch of aorta. The fourth branch is the left subclavian artery arising from a diverticulum of the aorta seen at the junction between the arch of aorta and the descending aorta. The patient with right-sided aortic arch with aberrant subclavian artery is generally asymptomatic and there is no particular association with cardiac anomalies[6].

Complete blood picture showed normal study,ESR-15mm/1sthr.Other parameters were within the normal limits. Chest x- ray showed absent left aortic contour.Tracheal bowing to the left at the level of the right aortic arch. Soft tissue indentation on right side of the distal trachea. Right sided descending aorta. The right arch is often seen as high riding and projecting as a mass in the right para-tracheal region.

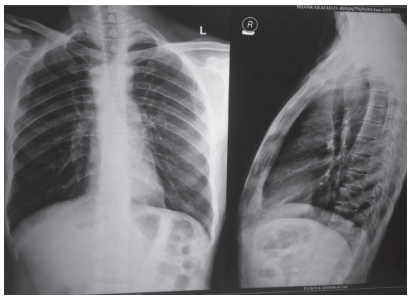

**Figure 1.** Chest xray showing right sided descending aorta with absent left contour,and soft tissue indentation on right side of the distal trachea.Tracheal bowing to the left at the level of the right aortic arch,and is often seen as high riding and projecting as a mass in the right para-tracheal region.

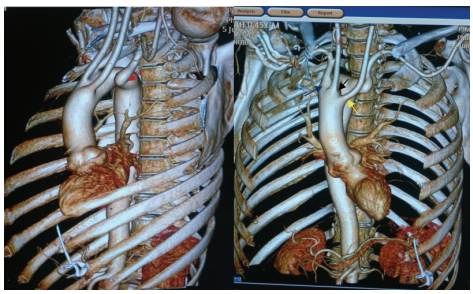

**Figure 1.** 3D volumetric image of CT Angio Showing Kommerell's diverticulum from which the left subclavian artery

arises, and the Right common carotid and Right subclavian Artery arising from the Arch of Aorta with no brachiocephalic trunk.

**DISCUSSION**

The two images of CT angio (Figure 2) showed left common carotid artery arising as a first branch (Figure 2) from ascending aorta. The second branch is right common carotid artery arising at the junction between ascending aorta and the arch of aorta,(Figure 2). So there is no brachiocephalic trunk. The third is the right sub-clavian artery arising separately from the arch of aorta and the fourth branch is the "left sub-clavian artery arising from a diverticulum of the aorta seen at the junction between the arch of aorta and the descending aorta as shown in Figure 2

The right sided arch can be divided into at least three types :

**Type I:** Right sided aortic arch with mirror image branching reported as the most common, accounting for up to 59% of all right sided arches . In most of the literature it is less common than type II. Occurs from interruption of the dorsal segment of the left arch between the left subclavian artery and the descending aorta, with regression of the right ductus arteriosus in the hypothetical double aortic arch. Usually associated with cyanotic congenital heart disease which include tetralogy of Fallot ,truncus arteriosus ,tricuspid atresia, transposition of the great arteries.

**Type II:** Right sided aortic arch with aberrant left subclavian artery common at least accounting for 39.5% of all right sided arches associated with Kommerell's diverticulum .occurs from interruption of the dorsal segment of the left arch between the left common carotid and left subclavian arteries with regression of the right ductus arteriosus in the hypothetical double aortic arch rarely produces symptoms and is usually incidental although can rarely cause oesophageal and/or tracheal compression rarely associated with other cardiovascular abnormalities.

**Type III:** Right sided aortic arch with isolation of the left subclavian artery; most rare type (0.8%) results from interruption of the left arch at two levels, with one level between the left common carotid and left subclavian arteries and the other level distal to the attachment of the left ductus may be associated with congenital subclavian steal syndrome and vertebrobasilar insufficiency can be rarely associated with congenital heart disease.

**CONCLUSION**

A right sided aortic arch is a rare congenital anomaly of the aorta. A high index of suspicion should be there on the routine chest radiographs. A CT-angiography can accurately diagnose the entire anomalous vasculature. A right-sided aortic arch is a rare congenital defect of the aorta.

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