

CASE REPORT

Type II right sided aortic arch with aberrant left subclavian artery (ALSA) – what clinician wants to know? - a case report

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ABSTRACT

Background: Right sided aortic arch is slightly rare variant of aortic arch which requires more description and elaboration for the management in clinician point view. This may remain asymptomatic or present with various vague symptomatology. It is mandatory for the clinician to be aware of the underlying anatomical details which may sometimes be responsible for the presenting complaints. Furthermore, this anomaly may also be associated with other abnormalities.

Case presentation: We present 60-years old male who complained of headache and vague chest pain of two weeks duration and underwent Contrast Enhanced Computerized Tomography (CECT) chest for further evaluation. There was an incidental finding of right sided aortic arch with Aberrant Left Subclavian Artery (ALSA). This anomaly was not responsible for any of the symptoms as per the CECT findings.

Conclusion: It is important to know the detailed relationship of right sided aortic arch with ALSA to the other neighboring anatomical structures. MDCT and MRI are always helpful tools to appreciate and apprise the clinician about the details of the anomaly in view of the management if required. Sometimes the symptoms may be present because of the compression by the vascular rings.

Keywords: Case report, right sided aortic arch, CECT, ALSA, vascular ring, case report.

Background

Right sided aortic arch with aberrant left subclavian artery (ALSA) is seen in 0.05% of the general population. The incidence of isolated right aortic arch is approximate 0.1% [1]. Originally, only aberrant right subclavian having slight dilatation at the origin was called as Kommerell diverticulum. This was named after Burckhardt Kommerell in 1936. Now the dilatation of aberrant subclavian at the origin is also called by the same name [2].

Case presentation

60-years old male reported to otolaryngology department with complaints of mild headache with vague chest pain and neck pain of two weeks duration. On examination,

the patient was of averagely built without any previous history of illness or any systemic disease. Systemic examination was unremarkable. X-ray paranasal sinus was unremarkable. Plain X-ray chest had shown right sided aortic arch without any other abnormality (Figure 1).

All the basic blood investigations were within normal parameters. The patient underwent contrast-enhanced computerized tomography (CECT) with 16- slices Siemens Scope whole body CT scanner. The findings revealed right sided aortic arch with aberrant left subclavian artery (ALSA). There was no abnormality in both the lung fields and mediastinal anatomy was within

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normal limits. Aortic arch was seen encircling the trachea (Figure 2).

The course of the thoracic aorta comes to the midline or to the left side as it approaches the diaphragmatic aperture (Figure 3). Common carotids on both sides could be seen originating from the arch independently

(Figure 4) Left subclavian had taken origin from the right side and coursing towards the left side lying posterior to the esophagus (Figure 5).

The patient was placed on symptomatic treatment as no further management was warranted in this case.



Figure 1: Plain X-ray chest PA view. The aortic knuckle is seen on right side (white arrow) and there is tracheal indentation over trachea at the same level (black arrow). Rest of the mediastinal structures are at normal sites.

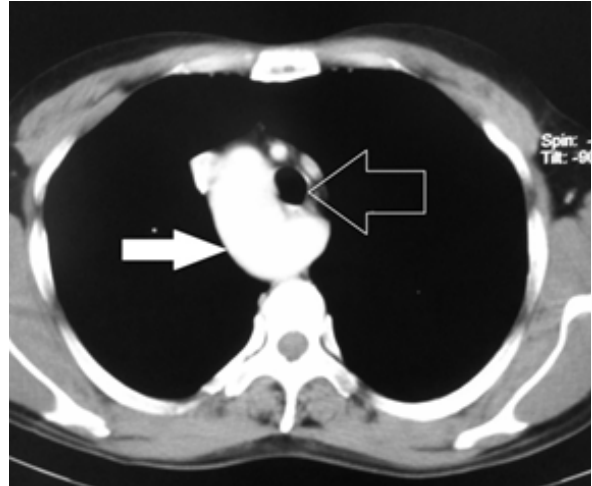


Figure 2: CECT Thorax axial section at aortic arch level. Aortic arch is seen on right side (white arrow) with trachea on left side (hollow white arrow).

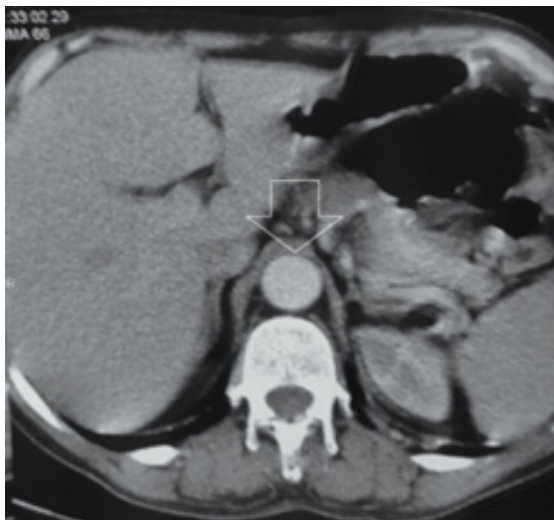


Figure 3: CECT thorax at the diaphragm aperture. Aorta lies almost in midline position (hollow white arrow).



Figure 4: CECT Chest 3D sagittal reformat image. Both common carotids are seen originating from the arch of the aorta (white arrow). Left common carotid is the first branch in order of the origin.

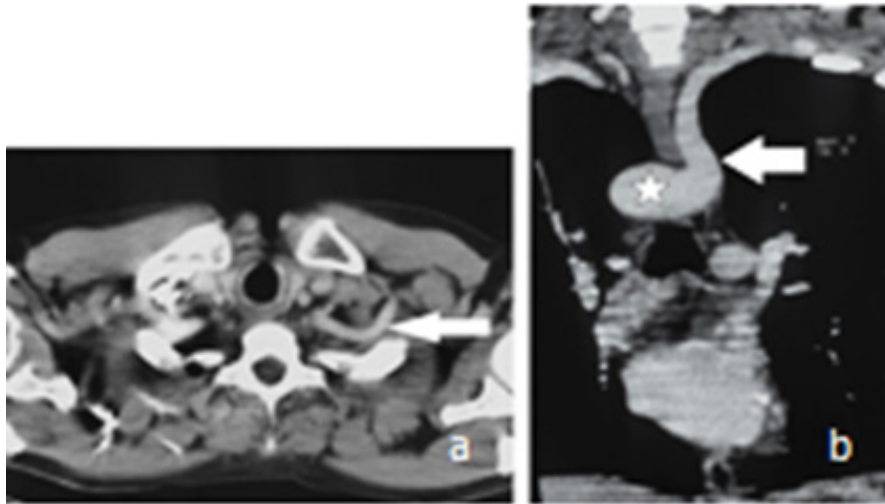


Figure 5: Aberrant left subclavian artery (ALSA). **(a)** axial section shows the course of ALSA at upper part of the chest. **(b)** coronal reformat image shows aneurysmal origin (white star) with upward deviation to the left upper extremity.

Discussion

Isolated right sided aortic arch is comparatively a common vascular anomaly and in many times this can be visualized as an incidental finding in CECT chest. This develops because of the regression of the portion of the dorsal segment between the left subclavian and common carotid in the hypothetical double arch. There is also persistence of the fourth embryonic aortic arch on right side [3]. Sometimes this becomes symptomatic because of the vascular rings and due to other additional abnormal findings [4]. Following two types of entities are of clinical importance:

Type I: Mirror image

Type II: when present with aberrant left subclavian artery (ALSA) Our present case falls in Type II category. Type I is associated with other congenital anomalies. Type II is very rarely associated with congenital heart disease (CHD) as compared to Type I. The most common association with Type I is Tetralogy of Fallot. ALSA can be retro-tracheal or retro-esophageal and may become symptomatic sometimes [5]. In our case, it was retro-esophageal and was asymptomatic. The order of origin of the vessels is left common carotid, right common carotid, right subclavian and then ALSA. This entity is slightly less common than the aberrant right side subclavian artery from the left side aortic arch. MDCT is the modality of choice for the delineation of these anomalies. Magnetic resonance imaging (MRI) and barium swallow play the additional role in the diagnosis of the vascular rings [6]. Dysphagia lusoria and dyspnea are the common complaints felt because of vascular rings. Magnetic Resonance Angiography (MRA) and Computerized Tomography Angiography (CTA) confirm the vascular mapping of the anomalies in detail.

Conclusion

Right sided aortic arch is diagnosed as an incidental finding in CECT chest as in our present case. The relationships of different structures are very important for the management point of view. CECT chest and angiography play an important role in these types of the cases.

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List of Abbreviations

ALSA Aberrant left subclavian artery
CECT Contrast-enhanced computerized tomography
CHD Congenital heart disease
CTA Computerized Tomography Angiography
MRA Magnetic Resonance Angiography
MRI Magnetic resonance imaging

Conflict of Interests

None

Funding

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Consent for publication

Informed consent was obtained from the patient to publish this case in a medical journal

Ethical approval

Ethical approval was obtained from the ethical committee of the institute to publish this case report in a medical journal.

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Authors' contribution

BBS wrote the case report and supervised the project. SS carried out the clinical evaluation. NB helped in procuring the data. SD carried out cross-sectional imaging. MRA helped in collecting all the images for the study.

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Summary of the case

Patient (gender, age)	1	Male, 60 year old
Final Diagnosis	2	Right sided aortic arch with ALSA
Symptoms	3	Vague headache, chest and neck pain
Medications (Generic)	4	Symptomatic
Clinical Procedure	5	CECT Chest
Specialty	6	Radiodiagnosis and ENT
Objective	7	To find out the cause of SYMPTOMS
Background	8	Vague headache, chest and neck pain
Case Report	9	Cross-sectional imaging for the chest pathology
Conclusions	10	MDCT in the diagnosis of the vascular anomalies
MeSH Keywords	11	Right sided aortic arc, CECT; ALSA, vascular ring, case report

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