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Case Report

# Anomalous right vertebral artery arising from the arch of aorta: report of three cases

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ABSTRACT

The right vertebral artery most commonly originates as the first branch of the right subclavian artery. Although anatomical variants of the aortic arch are commonly encountered on cross-sectional imaging, certain variants of the right vertebral artery are exceedingly rare. In this report, we present 3 cases of aberrant right vertebral artery arising as the last branch of the aortic arch, a very rare variant.



## Introduction

Vascular anatomical variants of the aortic arch are commonly encountered on cross-sectional imaging. Although variants of the aortic arch and its major branches are mostly asymptomatic, it is important for radiologists to be familiar with them for multiple reasons. Some are known to cause tracheoesophageal obstructive symptoms [1]. The presence of such a variant may also have implications related to angiographic or surgical interventions [2]. Here, we describe 3 rare cases of aortic arch variant in which the right vertebral artery arises distal to the left subclavian artery as the last branch of the aortic arch.

## Case 1

A 45-year-old man with cutaneous Kaposi's sarcoma presented to our department to undergo a computed tomography (CT) scan of the chest. The goal of the CT scan of the chest was to screen for lung involvement by Kaposi's sarcoma. The CT scan of the chest revealed normal lungs; however, showed a rare anatomical variant of the aortic arch. Instead of arising as the first branch of the right subclavian artery, the right vertebral artery originated from the medial surface of the aortic arch, distal to the left subclavian artery (Fig. 1). The origin of the vessel was focally aneurysmal (Fig. 2). The right vertebral artery then coursed posterior to the esophagus before regaining its habitual route ascending in the neck through the transverse foramina of the cervical vertebrae (Figs. 3 and 4). In addition, the patient had a common origin of the brachiocephalic and left common carotid arteries, a very common arch variant known as a "bovine arch" (Fig. 5). The left vertebral artery originated normally from the left subclavian artery. The aberrant right vertebral artery was the dominant vertebral artery in this patient (Fig. 6).

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**Fig. 1 – Case 1: Sagittal oblique maximum intensity projection (MIP) image of the computed tomography (CT) scan of the chest showing aberrant right vertebral artery arising as the last vessel of the arch (thin red arrow), distal to left subclavian artery (blue arrow). Also, note left common carotid artery (thick red arrow).**

## Case 2

A CT scan of the chest was performed in a 54-year-old man, who presented with axillary adenopathy, to rule out intrathoracic lymphoproliferative disease. The study demonstrated no intrathoracic pathological findings; however, an aberrant right vertebral artery originating from the aortic arch distal to the left subclavian was noted. The artery passed retroesophageally and eventually assumed the normal position within the right vertebral canal. A focal dilatation, reminiscent of a Kommerell diverticulum was noted at the origin of the aberrant artery (Figs. 7-9). The rest of the aortic arch vessels demonstrated normal configuration (Fig. 10). The left vertebral artery was dominant.

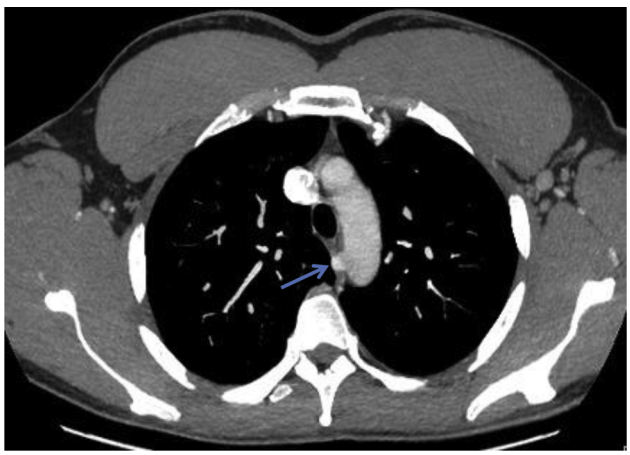

**Fig. 2 – Case 1: Axial MIP image of the CT scan of the chest showing aneurysmal origin of the aberrant right vertebral artery (blue arrow) reminiscent of a Kommerell diverticulum.**

**Fig. 3 – Case 1: Axial image of the CT scan of the chest showing right vertebral artery (blue arrow) crossing the mediastinum posterior to the esophagus (red arrow).**

## Case 3

A 36-year-old man presented to the emergency department with signs of esophageal perforation. A thoracic CT scan

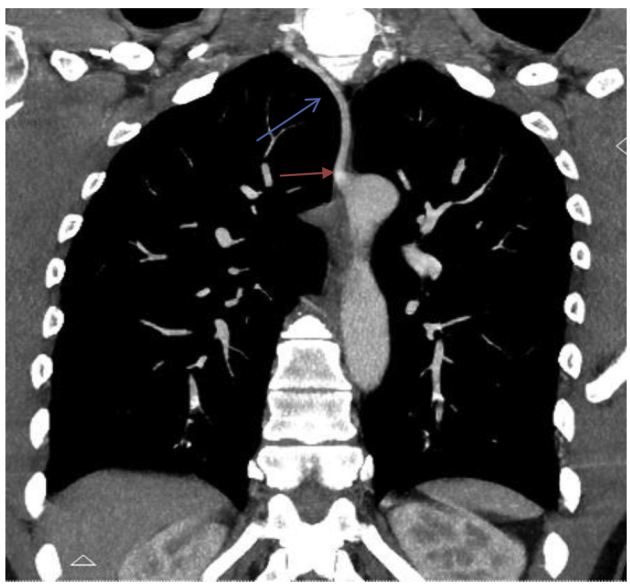

**Fig. 4 – Case 1: Coronal oblique MIP image of CT scan of the chest showing proximal course of the aberrant right vertebral artery (blue arrow) from origin to cervical foramina. Notice the aneurysmal origin (red arrow).**