



Thrombosis of Kommerell's diverticulum with subclavian steal phenomenon in a patient with non-small cell lung carcinoma under chemotherapy

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ARTICLE INFO

Article history:

Received 20 July 2016

Accepted 22 July 2016

Available online 30 July 2016

Keywords:

Kommerell's diverticulum

Aberrant subclavian artery

Thrombosis

Multidetector computed tomography

Color doppler ultrasound

Non-small cell lung carcinoma

ABSTRACT

Kommerell's diverticulum (KD) is defined as a bulbous dilatation of the origin of an aberrant subclavian artery due to a remnant of the left fourth aortic arch. We report the case of an asymptomatic woman in whom progressive thrombosis of the KD extending to the prevertebral tract of an aberrant right subclavian artery was detected at multidetector computed tomography imaging for lung cancer staging performed before and after the beginning of chemotherapy. Reversed blood flow in the ipsilateral vertebral artery due to subclavian steal phenomenon was also observed by color Doppler ultrasound examination.

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1. Introduction

Kommerell's diverticulum (KD) is a rare condition consisting of both an aneurysm of the thoracic aorta and an aneurysmal orifice of an aberrant subclavian artery. It corresponds to a conical dilatation at the origin of the aberrant vessel and is therefore also known as “lusoria diverticulum”, “remnant diverticulum” or “lusoria root” [1–3].

Originally, Burckhard F. Kommerell reported an aortic diverticulum in a patient having a left aortic arch with an aberrant right subclavian artery in 1936 [4]. Basically, there are three types of aortic arch diverticulum:

- the diverticulum at the left aortic arch with aberrant right subclavian artery (more frequently: 0.5%–2.0% of the population);
- the diverticulum at the right aortic arch with anomalous origin of the left subclavian artery (0.05%–0.1%);
- the aortic diverticulum at the aortic-ductal junction [1–3].

Our purpose is to show the case of an asymptomatic patient with complete thrombosis of the prevertebral portion of an aberrant right subclavian artery, progressive KD thrombosis, and reverse ipsilateral vertebral artery flow that was detected by multidetector computed tomography (MDCT) imaging performed for lung cancer staging before and after the beginning of chemotherapy, and subsequently confirmed by a color Doppler ultrasound examination.

2. Case presentation

A 70-year-old Caucasian woman with biopsy proven non-small cell lung carcinoma (NSCLC) underwent a contrast-enhanced whole body MDCT examination for cancer staging. MDCT findings showed a left aortic arch with a KD, an autonomous origin of the left vertebral artery from the aortic arch, and origin of both common carotid arteries from a short common trunk. An aberrant (lusory) right subclavian artery stemmed from the KD and was completely thrombosed at its origin as well (Fig. 1). The patient received chemotherapy, and a follow-up MDCT examination performed two months later showed complete thrombosis of the KD extended to the prevertebral portion of the right subclavian artery. The right vertebral artery was patent as well as the post-vertebral portion of the ipsilateral subclavian artery, suggesting retrograde vertebral flow due to subclavian steal phenomenon (Fig. 2).

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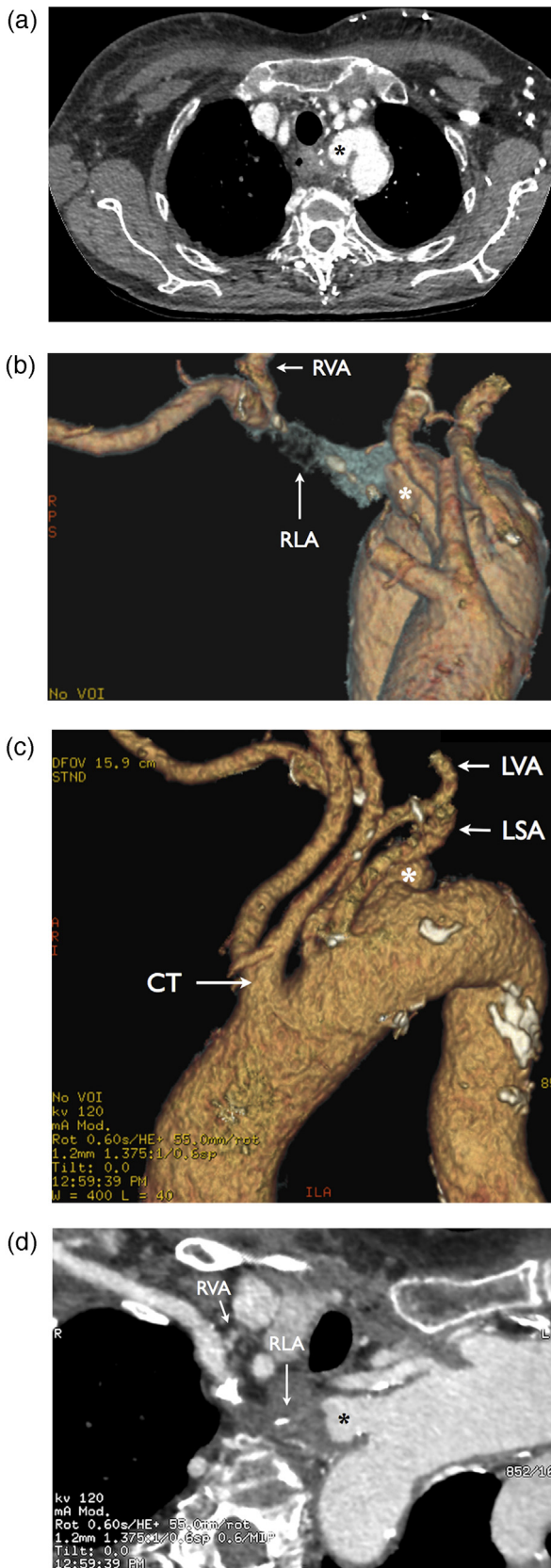


Fig. 1. Baseline MDCT examination. (a) Axial source image, (b, c) Volume Rendering and (d) Curved Planar views show patent KD (*) associated with thrombosed prevertebral right lusory artery (RLA), autonomous origin of the left vertebral artery (LVA) from the aortic arch, and origin of both common carotid arteries from a short common trunk (CT). The proximal portion of the right vertebral artery (RVA) is patent, as well as the RLA distal to it. LSA = left subclavian artery.

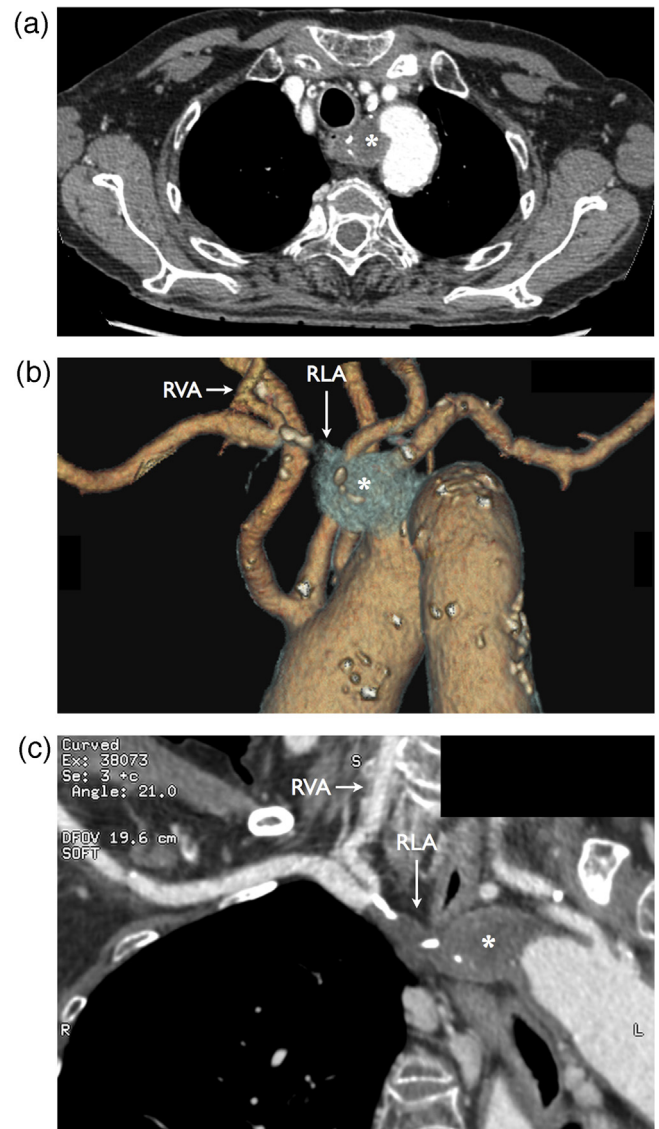


Fig. 2. Two-month follow-up MDCT examination. (a) Axial source image, (b) Volume Rendering and (c) Curved Planar views show complete thrombosis of the KD extending from the prevertebral RLA. As at baseline, the proximal portion of the RVA and the RLA distal to it are patent.

A Doppler ultrasound examination was performed some days later for hemodynamic assessment, confirming reverse flow in the right vertebral artery compared with the left side (Fig. 3). The patient had never complained of any symptoms related to subclavian steal syndrome or tracheo-esophageal compression, and laboratory tests did not reveal any pre-existing hematologic disorders potentially favoring a pro-thrombotic condition.

3. Discussion

The embryological development of the aorta begins during the second week of gestation and is completed by the seventh week. Between the fourth and fifth weeks of embryonic life, blood leaves the heart by a single vessel (i.e. the truncus arteriosus), which divides into two branches named the ventral and dorsal aortae, respectively. The ventral aortae are connected with the dorsal aortae by six branchial vessels, called aortic arches. These latter are numbered from cephalad to caudal and normally develop into the thoracic aorta and its branches.

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