

A CASE OF A RARE AORTIC ARCH VARIATION: THE AVIAN FORM

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Variations in the branching pattern of the aortic arch are multiple. The avian form is an extremely rare anatomical variation with only a few reported cases in the literature. Herein we report a case of avian variation with two branches arising from the aortic arch: a bicarotid trunk and a common origin for bilateral subclavian arteries.

Key-word: Aorta, abnormalities.

The usual or normal branching pattern is seen with an incidence of 64.9-94.3% according to the literature (1). But in the rest, the branches do not follow the usual branching pattern and have some variations. Avian aortic arch, which is defined as common origins of bilateral common carotid and subclavian arteries, is an extremely rare anatomical aortic arch variation with only two reported cases in the related literature. Herein, we present a case of avian variation of the aortic arch with digital subtraction angiography (DSA) and magnetic resonance angiography (MRA) findings.

Case report

A fifty-eight-year-old man with symptoms of vertigo and headache

was admitted to our hospital. In the diagnostic work-up a right cerebellar mass was diagnosed with cranial magnetic resonance imaging and MRA. The patient underwent a cerebral DSA for further assessment. An aortic arch injection was performed with a 5 French pigtail catheter before supraaortic selective catheterization which demonstrated a common trunk for bilateral common carotid arteries and a common trunk for bilateral subclavian arteries (Fig. 1). Gadolinium-enhanced MRA also demonstrated the two main branches arising from the aortic arch (Fig. 2). No other associated anomaly was detected in the patient. The patient was operated for his right cerebellar mass and he was discharged from the hospital without any neurological deficit.



Fig. 1. — Angiographic view of the aortic arch in 30 degrees left anterior oblique position. Note the two branches arising from the aortic arch; a common trunk for bilateral common carotid arteries (thin arrow) and a common trunk for bilateral subclavian arteries (thick arrow).



Fig. 2. — Coronal view of the aortic arch with Gadolinium-enhanced MRA. A bicarotid trunk (thin arrow) and a common trunk for bilateral subclavian arteries (thick arrow) with aberrant course of the right subclavian artery can be seen.

Discussion

There are multiple variations in the branching pattern of the aortic arch with an incidence of 17% (1). The incidence of each variation according to different studies in the literature is shown in Table I. Bovine aortic arch, which describes the common origin of brachiocephalic and left common carotid arteries, is the most common variation of the aortic arch with an incidence of 11-27% (1). An aberrant right subclavian artery (ARSA) is also one of the anatomical variations of the aortic arch with an incidence of 0.6-0.7% (2, 3). In up to 20-30% of these cases a common carotid trunk is also associated with ARSA (4). Moreover the presence of a com-

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Table I. – Incidence of variations in the branching pattern of aortic arch.

Branching patterns	Natsis et al. (1) (633 angiographies)	Karacan et al. (2) (1000 CT angiographies)	Ergun et al. (3) (1001 CT angiographies)
Classical pattern (BT, LCC, LS)	83%	79.2%	85.2%
Bovine arch (LCC originating from BT)	15%	14.1%	7.8%
LV originating from the aortic arch (BT, LCC, LV, LS)	0.79%	4.1%	5.1%
RS, bicarotid trunk, LS	0.16%	-	0.2%
Bicarotid trunk, LS and aberrant RS	0.16%	0.7%	-
Avian form (bicarotid trunk and common origin of the subclavians)	0.16%	-	-
RS, RCC, LCC, LS	0.16%	-	-
BT, thyroidea ima artery, LCC, LS	0.16%	0.1%	-
LV originating from the aortic arch in the presence of bovine arch	-	1.2%	-
RCC, LCC, LS and aberrant RS	-	0.6%	0.7%
RCC, RS, LCC, LS	-	-	0.7%
RS, RCC, left BT	-	-	0.1%
Right-sided aortic arch	-	-	0.1%

BT: brachiocephalic trunk, LCC: left common carotid artery, LS: left subclavian artery, LV: left vertebral artery, RS: right subclavian artery, RCC: right common carotid artery.

mon trunk for subclavian arteries as demonstrated in our case of avian form is an extremely rare condition. In this variation, there are only two branches arising from the aortic arch like in birds, so called avian form.

Avian variation is often asymptomatic and treatment is not needed. Its clinical importance is related to ARSA. The course of ARSA from left to the right side may be retroesophageal, pretracheal or it may also run between the trachea and the esophagus. These anatomical relations can cause symptoms like dysphagia, dyspnea and right upper extremity ischaemia (1).

Poultides et al. (5) reported the same aortic arch variation in 2004. They found this variation in a cadaver during routine anatomical dissection. In another study about anatomical variations in the human aortic arch including 633 angiographies, Natsis et al. (1) found avian variation in only one patient with the incidence of 0.16%. They designated this aortic arch variation as type 6. To

our knowledge there is no other reported case in the English literature representing this variation except these two studies. This rare variation was not reported in two recent studies about the anatomical variations of the aortic arch with 64-slice computed tomography angiography including 1000 and 1001 patients (2, 3).

Being aware of the variations in the branching pattern of the aortic arch is very important especially in patients who have to undergo four vessel angiography, aortic instrumentation or supraaortic thoracic, head and neck surgery. Because of the abnormal course of vessels, lack of knowledge of these variations could give rise to serious surgical complications during procedures in the superior mediastinum and neck (6).

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