Development of the Aortic Arch and Aortic Arch Variants

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Disclosures

* Research-grants, travelling, proctoring speaking-fees, IP, royalties with Cook.
* Consultant with Philips
* Shareholder Mokita-Medical GmbH
* IP, Consultant with Terumo Aortic
Hypothetical Double Aortic Arch (Jesse E. Edwards)
Hypothetical Double Aortic Arch
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Right Arch

Left Arch

RSA

RCCA

LCCA

LSA

Lt. ductus

Lt. arch

Rt. arch

Edwards JE; Med Clin North Am 32:925-49
Left Arch, Aberrant RSA „Lusoria“
Right Arch, Aberrant LSA „Lusoria“
Bilateral Arch
“Bovine arch” refers to a group of congenital variants of the human aortic arch vessels in which there is an aberrant origin of the left common carotid artery. Two anatomic configurations:

- **Common origin of innominate artery and left common carotid artery (most common)**

- **Left common carotid artery originates from innominate artery at a distance from aorta (less common)**

*Note that **bovine arch** is a misnomer – the cow’s aorta does not resemble either of these configurations.*

„Bovine Arch“
Common Arch Variants

- Normal Arch: 82%
- Bovine Arch: 14%
- Isolated Vertebral: 3%
- Aberrant Right Subclavian: 1%

Dumfath et al. 2015; J Thor Cardiovasc Surg 149:1586-92
Association with Anatomic Arch Variants

- Aortic Dissection
- Bicuspid aortic valve
- Aortic Aneurysm
Arch Variants and its implications on Intervention
VA-Dominance
VA-Dominance

Posterior inferior cerebellar artery (PICA)

Posterior inferior cerebellar artery (PICA)
PICA-Variant

POSTERIOR CEREBRAL

PCA

PCoA

MCA

ACA

ICA

BASILAR Artery

BA

ANTEOR SPINAL Artery

ASA

VERTEBRAL Artery

VA

SUPERIOR CEREBELLAR Artery

SCA

ANT. INFERIOR CEREBELLAR

Artery

AICA

POST. INF. CEREBELLAR Artery

PICA
Single LVA
VA - Transposition
Single LVA

Dumfath et al. 2015; J Thor Cardiovasc Surg 149:1586-92
LVA-Origin

LSA Transposition or Bypass?
A. Thyroidea Ima
Situs Inversus
Right VA from RCCA
Right VA from RCCA
True Bovine Arch
Anterior Bovine IA
Anterior Bovine IA
Anterior Bovine IA
LSA-Aneurysm and Coarctation
LSA-Aneurysm and Coarctation
Anatomic variants more common in patients with arch pathology

LVA-anatomy highly variable

Be prepared for implications on arch interventions
Welcome to Essen!

5th AORTIC LIVE SYMPOSIUM

AORTIC LIVE 2018
October 29-30, 2018
Congress Center Essen, Germany

In 2018 Aortic Live Symposium will return to Essen, Germany again. We are looking forward to welcoming you again next year!