

IMÁGENES EN MEDICINA

Anatomical aortic variation: Bovine Arch

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The most common aortic arch described is the one that gives rise to three branches. The design "classical" is formed by the brachiocephalic artery (common trunk of the right subclavian artery and the right common carotid artery), the left common carotid artery, and the left subclavian artery. This pattern takes place in 65-80% of the cases¹. The configuration brachiocephalic trunk and the left common carotid artery with a common origin, named bovine arch, is the most common variant². The bovine arch is observed in 10 to 20% of the population³. The configuration composes of a brachiocephalic trunk and the left common carotid artery with a common origin and left subclavian artery.

(Figure 1)

Martin Heinrich Rathke (1793 to 1860) developed a diagram in order to understand the embryology. The diagram consists of 6 branchial arches in the wall of the foregut. Development of the branchial arches begins during the second week of gestation and is completed by the seventh week. On the right side, the dorsal contribution of the sixth arch disappears, and on the left it persists as the ductus arteriosus. The intersegmental arteries migrate and form the subclavian arteries^{4,5}. (Figure 2,3)

The source of bovine arch is probably due the slower growth of the ventral aortic root between the third and fourth arches. This phenomenon allows the coalescence of the left common carotid artery with the brachiocephalic trunk⁶.

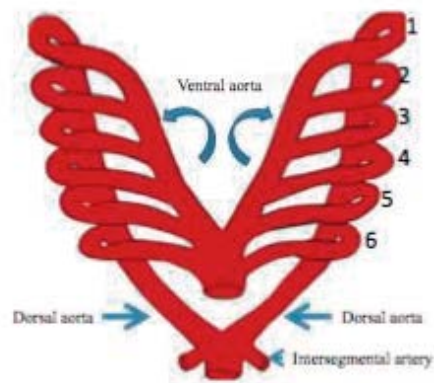
FIGURE 1

BOVINE ARCH. CT SCAN IMAGE. VOLUMEN RENDERED. LEFT LATERAL VIEW. BRACHIOCEPHALIC TRUNK AND RIGHT COMMON CAROTID ARTERY SHARE A COMMON ROOT.



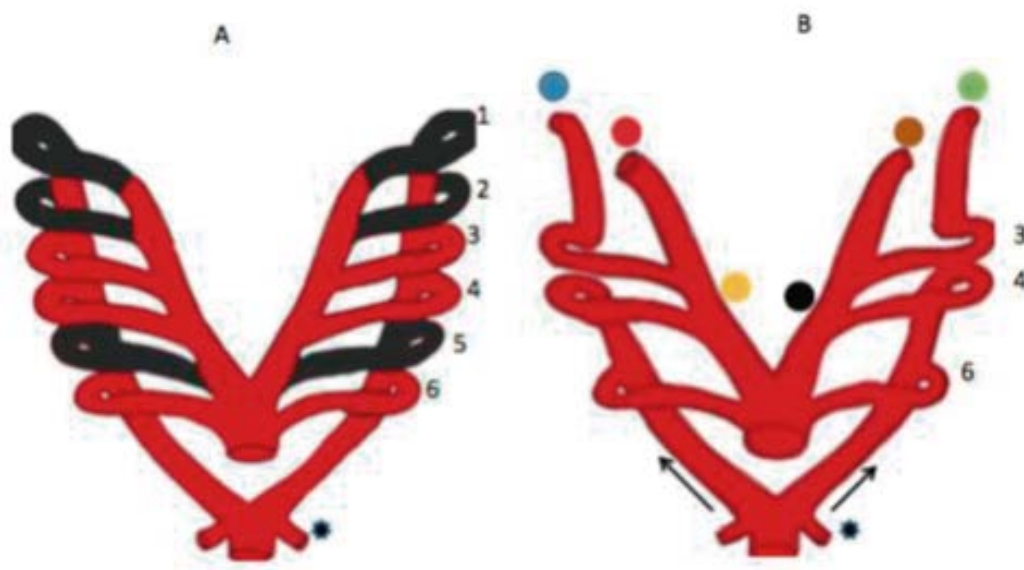
FIGURE 2

RATHKE DIAGRAM. SCHEMATIC REPRESENTATION OF THE DEVELOPMENT OF THE NORMAL AORTIC ARCH AND ITS BRANCHES. THE BRANCHIAL ARCHES ARE NUMBERED 1 TO 6 FROM CEPHALAD TO CAUDAD (NUMBERS 1 TO 6). EACH OF THE BRANCHIAL ARCHES CONNECTS PAIRED DORSAL (ARROWS) AND VENTRAL AORTAS (CURVED ARROW). INTERSEGMENTAL ARTERY (ARROWHEAD)

**FIGURE 2**

RATHKE DIAGRAM. SCHEMATIC REPRESENTATION OF THE AORTIC ARCH BRANCHING.

A. BLACK-SHADED BRANCHIAL ARCH SEGMENTS PORTIONS OF ARCHES DISAPPEAR^(1,2,5). BRANCHIAL ARCHES IN RED REMAIN AND TRANSFORM IN ARTERIES^(3,4,6). INTERSEGMENTAL ARTERY (ASTERISK).
B. AORTIC ARCH DERIVES FROM FOURTH ARCH (NUMBER 4). THE VENTRAL PART OF THE SIXTH ARCH TRANSFORM INTO THE PULMONARY ARTERY⁽⁶⁾. THIRD ARCH⁽³⁾ AND VENTRAL PART OF BRANCHIAL ARCHES DEVELOP TO LEFT COMMON, EXTERNAL AND INTERNAL CAROTID ARTERIES. INTERSEGMENTAL ARTERIES (ASTERISK) MIGRATES CRANEAALLY (ARROWS) AND FORM SUBCLAVIAN ARTERIES. BLACK CIRCLE, LEFT COMMON CAROTID ARTERY; ORANGE CIRCLE, RIGHT COMMON CAROTID ARTERY; BROWN CIRCLE, LEFT EXTERNAL CAROTID ARTERY; GREEN CIRCLE, LEFT INTERNAL CAROTID ARTERY; RED CIRCLE, RIGHT EXTERNAL CAROTID ARTERY; BLUE CIRCLE, RED CIRCLE RIGHT INTERNAL CAROTID ARTERY.



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