

Embryogenesis of CNS blood vessels

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CNS kraujagyslės vystosi iš *neural tube supančios mezenchimos*;

- pradžioje tai *random network of coalescing channels*.
- vėliau dalis kanalų nyksta, dalis vystosi toliau – išryškėja viena stambi išilginė arterija, einanti per visą neuraxis ilgį – **VENTRAL MEDIAN ARTERY** (this artery splits and reunites rostrally).

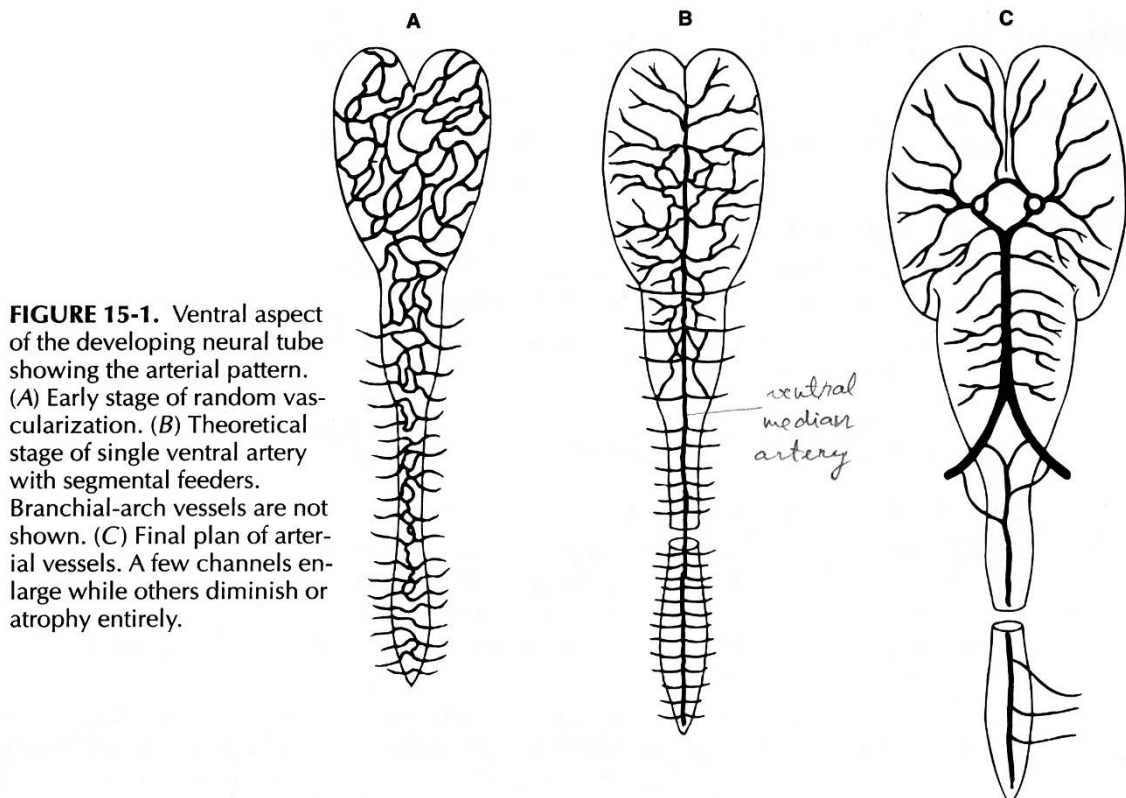


FIGURE 15-1. Ventral aspect of the developing neural tube showing the arterial pattern. (A) Early stage of random vascularization. (B) Theoretical stage of single ventral artery with segmental feeders. Branchial-arch vessels are not shown. (C) Final plan of arterial vessels. A few channels enlarge while others diminish or atrophy entirely.

Ventral median artery receives blood:

- at **spinal levels** – from *somite arteries* (branch regularly from aorta)
- at **cerebral level** – from *carotid and vertebral arteries*; brain stem šiek tiek mitybos gauna ir iš *branchial arches arterijų* (per kranialinių nervų kamienus).

Ventral median artery branches:

- Paramedian arteries** – atsišakoja stačiu kampu ir iš karto perforuoja neural tube.
- Circumferential arteries** (circumnavigate neuraxis and send perforating branches):
 - short circumferential arteries**
 - long circumferential arteries** – gaubia cerebral & cerebellar hemispheres dar prieš pasibaigiant fissuration (t.y. dar neprasidėjus sulcation) – vystantis žievės paviršiui, arteries follow contour of cortical surface.

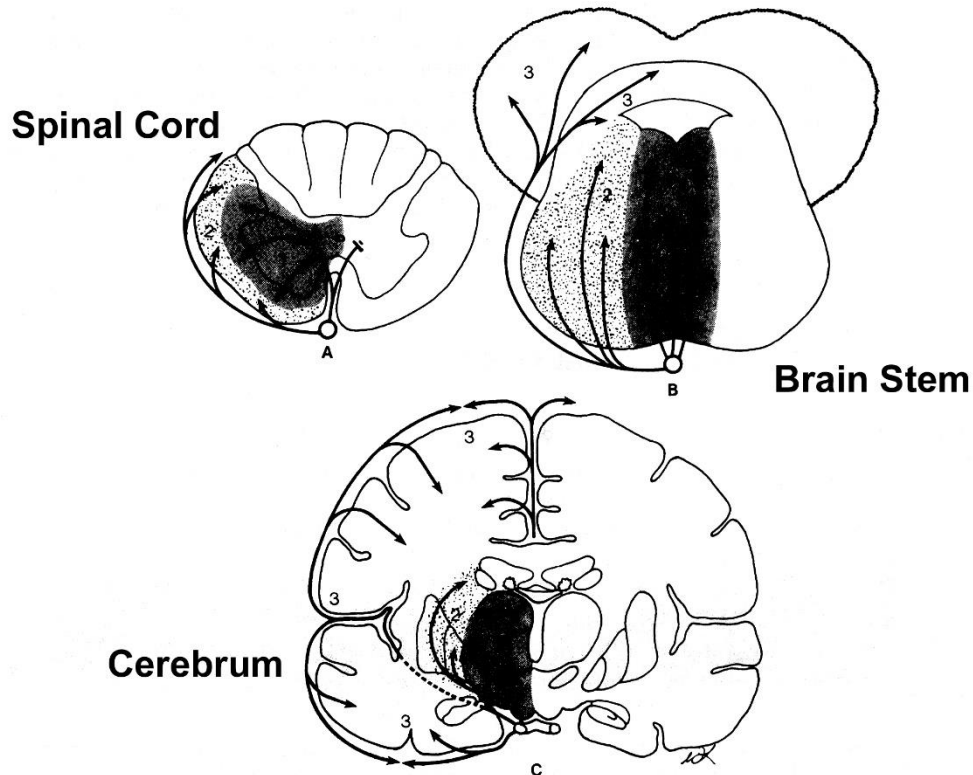


FIGURE 15-2. Transverse sections of the (A) spinal cord, (B) brain stem, and (C) cerebrum, showing how a ventral arterial channel provides paramedian branches and short and long circumferential branches that then perforate the wall of the neural tube. 1 = paramedian vessel (*shaded area*); 2 = short circumferential vessel (*dotted area*); 3 = long circumferential vessel (*white area*).

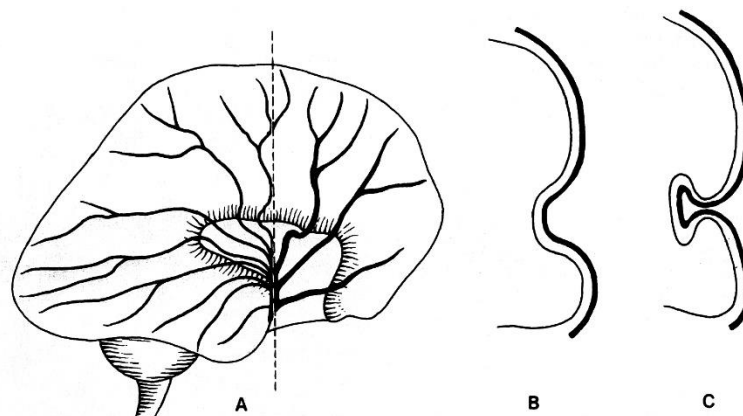


FIGURE 15-3. (A) Lateral view of the right cerebral hemisphere. The cerebral vessels form on the surface of the cerebrum and are then infolded into the fissures some sulci, in this case the insular region of the Sylvian fissure. (B) Coronal section at the level indicated by the interrupted line in (A). (C) Coronal section at the same level at a later stage, showing further infolding of the cerebral arteries as the opercula grow over the sylvian fissure.

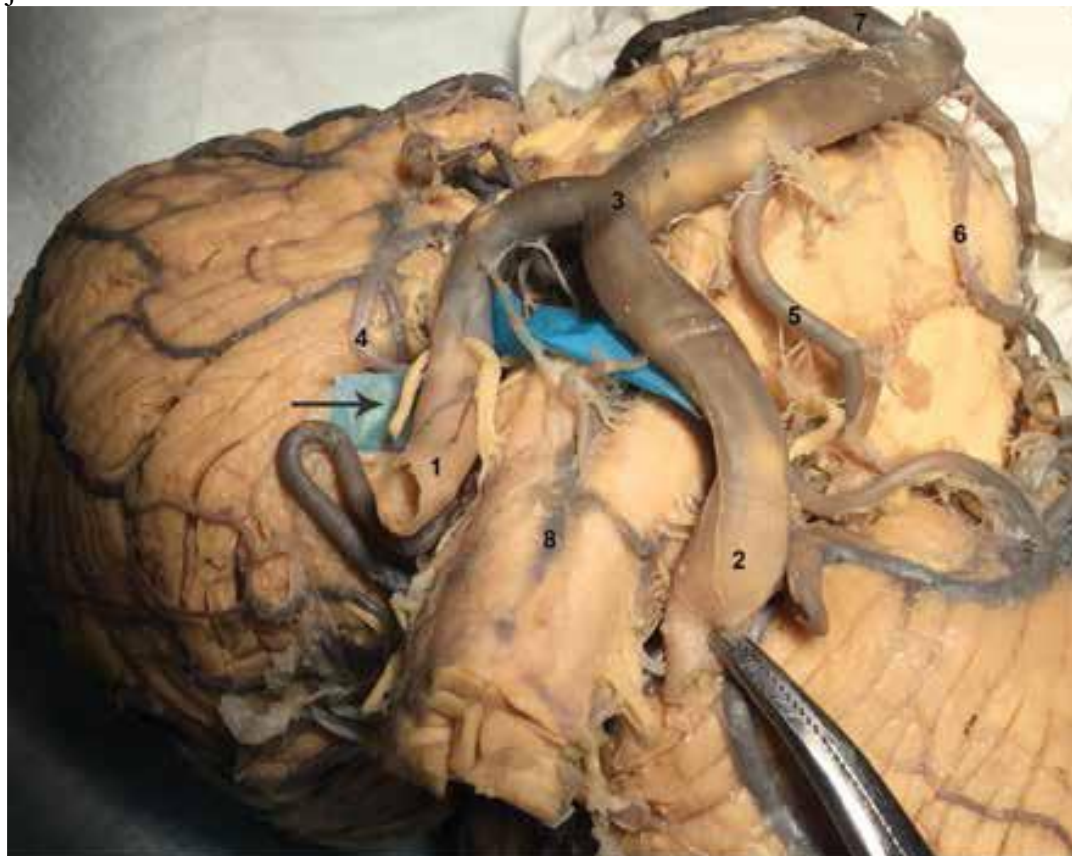
ANATOMICAL VARIANTS

FENESTRATION

(differs from duplication!) - persistent segment of embryonic intersegmental arteries (hypoglossal or proatlantal).

- usually asymptomatic.
- most fenestrations (>70%) are extracranial and occur at C1-C2 level.

Hypoglossal nerve traversing fenestrated right vertebral artery, just proximal to vertebrobasilar junction:



- | | | |
|----------------------------|-------------------------------|---------------------|
| 1 - Right vertebral artery | 5 - AICA | → Hypoglossal nerve |
| 2 - Left vertebral artery | 6 - SCA | |
| 3 - Basilar artery | 7 - Posterior cerebral artery | |
| 4 - PICA | 8 - Anterior spinal artery | |

ANOMALOUS ORIGINS

PICA – see p. A205 >>

BIBLIOGRAPHY for ch. “Vascular” → follow this [LINK](#) >>