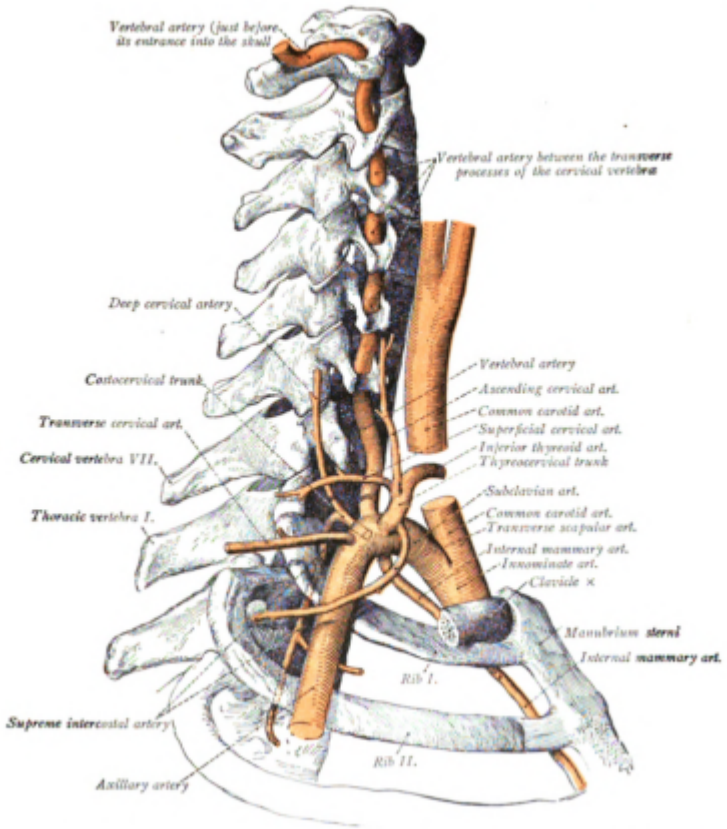
Vertebral artery

- Unilateral Hearing Loss as the Sole Presentation of Extensive Intracranial Epidermoid Cyst: A Case Report
- Antithrombotic treatment of cervical artery dissection: A systematic review and meta-analysis
- Forensic application of micro-radiological analysis and 3D-printed vertebrae in a stab wound homicide case
- Management and Follow-Up of a Traumatic Vertebral Artery Pseudoaneurysm: A Case Report on Pipeline Embolization and Recovery
- Risk Prediction of Cerebrovascular Ischemic Events Following Cervical Artery Dissections Using High-Intensity Transient Signals: A Systematic Review, Meta-Analysis and a single center experience
- Kissing Vertebral Arteries Causing Myelopathy Treated With Microvascular Decompression Using Transposition Technique: 2-Dimensional Operative Video
- Sequential and coexisting bilateral suboccipital cavernous sinus arteriovenous fistulas successfully treated with unilateral transvenous coil embolization: illustrative case
- Vertebral artery injury following cervical disc arthroplasty - A systematic review



Blood is delivered to the brain via the carotid and vertebral arteries. The vertebral arteries are located at the back of the neck and merge at the base of the brain to form the basilar artery. The vertebral and basilar arteries supply blood to several structures in the brain including: the occipital cortex, the brainstem consisting of the midbrain, pons and medulla, the cerebellum and the thalamus.

The vertebral artery is one of the major arteries of the neck. They branch from the subclavian artery, courses through the foramen transversanium from C6 to C2, and merge to form the single midline basilar artery in a complex called the vertebrobasilar system.

Origin

The origin of the vertebral arteries is usually from the posterior superior part of the subclavian arteries bilaterally, although the origin can be variable:

brachiocephalic artery (on the right) aortic arch: 6% of cases, most on the left The VA is normally 3-5 mm in diameter and the ostium is the most common site of stenosis.

When the origin is from the arch, then it is common for the artery to enter the foramen transversarium at a level higher than normal (C5 instead of C6).

Segments

Vertebral artery segments.

Branches

▶ Anterior meningeal artery. Arises at the body of C2 (axis), may feed chordomas or foramen magnum meningiomas, may also act as collateral in vascular occlusion

▶ Posterior meningeal. Maybe a source of blood for some dural AVMs

▶ Medullary (bulbar) aa.

▶ Posterior spinal

▶ Posterior inferior cerebellar artery (PICA) (largest branch). Usually arises ≈ 10 mm distal to the point where VA becomes intradural, ≈ 15 mm proximal to the vertebrobasilar junction.

Perforating vessels

The perforating arteries were noted to range in number from 1 to 11 (mean, 6.5) and in diameter between 100 microm and 520 microm (average, 243 microm). They arose from the vertebral artery (VA) (54.54%), 8 from the right, the left or both VAs. The anterior spinal artery (ASA), which was singular (81.82%), duplicated (13.64%), or plexiform (4.55%), always gave rise to the perforators. The vascular roots of the ASA were the source of the perforators in 95.45% of the brains. The latter vessels arose from the anterolateral arteries in 50% of the cases. The anastomoses involving the perforators, which were present in 40.91% of the brains, varied in diameter between 100 microm and 350 microm (mean, 169 microm). The perforating vessels gave rise to the side branches in 95.45% of the brains that varied in diameter from 100 microm to 300 microm (average, 161 microm). The perforators usually entered the foramen cecum and the anterior median sulcus, and then continued close and parallel to the raphe of the medulla. The perforators can be compressed by a VA aneurysm, which was found in one among the 71 examined patients with cerebral aneurysms [1)].

Variations

Vertebral artery variations.

Anomalies

The embryogenesis differs from that of any other vessel, and is characterized by a great variety of malformations and anomalies. Some of the malformations are truly pathological (that is symptomatic); the anomalies are either found by chance postmorten or by angiography. All of these should be kept in mind by the surgeon approaching the deep cervical and craniospinal regions as well as by the interventional radiologist.

Anomalous origin of the right vertebral artery may not be the sole reason behind a disease process. However, it can certainly lead to a misdiagnosis during diagnostic vascular studies. Detailed information is essential for any surgery or endovascular intervention in this location.

see Tortuous vertebral artery.

Tortuosity and kinking, course anomalies, duplication and fenestration, persistence of primitive arteries, and anomalies of collateral branches. Other pathologies of the cervical VA associated exclusively with genetic diseases, such as spontaneous aneurysms and arteriovenous fistulae in neurofibromatosis type 1 are also to be considered [2].

Its important to identify and categorize anatomical anomalies of the vertebral artery and determine the relationship of these unexpected variations to the site for transforaminal cervical epidural steroid injections (CTESI).

Vertebral artery compressing the medulla and causing intractable vomiting has only been reported in two ocasions A 69-year-old woman with intractable nausea and vomiting causing a 50 pound weight loss and who failed medical management and whose symptoms were completely reversed following microvascular decompression (MVD) [3].

The incidence of anomalous origin of a vertebral artery seems to be underestimated in recent literature. A careful review of the literature shows more than 100 such cases. The right vertebral artery can arise from the aortic arch or one of its branches. Dual origin of the vertebral artery is not uncommon. The embryologic developmental hypotheses are contradictory and complex.

Anomalous origin of the right vertebral artery may not be the sole reason behind a disease process. However, it can certainly lead to a misdiagnosis during diagnostic vascular studies. Detailed information is essential for any surgery or endovascular intervention in this location [4].

Bypass

V3 Vertebral Artery to M2 Middle Cerebral Artery Bypass: 3-Dimensional Operative Video [5].

Vertebral Artery to Anterior Inferior Cerebellar Artery Bypass [6]

Vertebral Artery aneurysm

Vertebral Artery aneurysm

1)
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2)
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Gorton L, Ashour AM, Lebovitz J, Cosola Di A, Abdulrauf SI. Intractable vomiting caused by vertebral artery compressing the medulla: A case report. J Craniovertebr Junction Spine. 2015 Apr-Jun;6(2):89-91. doi: 10.4103/0974-8237.156071. PubMed PMID: 25972717; PubMed Central PMCID: PMC4426530.
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6)
https://academic.oup.com/ons/article/13/1/159/2608021/V3-Vertebral-Artery-to-Anterior-Inferior