

Anatomical features and variations of the vertebrobasilar system

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The posterior circulation of the brain constitutes the vertebrobasilar system and its branches, which are responsible for about 20% of the brain blood supply. The aim of this study was to describe the morphological characteristics of the vertebrobasilar system. We examined radiographs of 103 patients, 58 male and 45 females, age range from 25 - 82, mean age 58.4 years who had CT angiography undertaken for a variety of clinical reasons, performed as a part of their medical treatment at the University Institute for Radiology in Skopje, Macedonia. The left vertebral artery arose from the left subclavian artery in 94.17% and the right vertebral artery had origin from the right subclavian artery in 99.02%. Variable origin of the left vertebral artery from the aortic arch was noticed in 5.82% and in one patient (0.97%) we found atypical arisen of the right vertebral artery from the right common carotid artery. The diameter of the vertebral artery was 3.20 ± 0.74 mm on the right side and 3.33 ± 0.76 mm on the left side. The mean length of the basilar artery was 31.60 ± 5.1 mm (from 21.4 mm to 44.1 mm). The mean diameter of the basilar artery was 3.27 ± 0.52 mm (from 2.22 to 4.87 mm). Most of the SCA arise from the basilar artery as a single vessel. The most common variations of the SCA were duplication (frequency 1.94% on right and 0.97% on left) and origin from PCA (frequency 1.94% bilateral). In four patients (3.88%) we found fenestrations of posterior brain circulation, three fenestrations (2.91%) was on the basilar artery and one fenestration (0.97%) was on the vertebral artery. In one patient persistent trigeminal artery was found. A sound knowledge of vertebrobasilar system anatomy and variations is important during diagnostic, operative and endovascular procedures.

References

- 1) Wang, S.; Ren, WJ.; Zheng, L.; Sun, ST.; Zhang, BH.; Chen, Y.; Xiang, LB. Anatomical Variations of the Vertebral Artery: Analysis by Three-Dimensional Computed Tomography Angiography in Chinese Population. *Orthop Surg.* 2021;13(5):1556-1562.
- 2) Tsantili, AR.; Karampelias, V.; Samoilis, A.; Chrysikos, D.; Antonopoulos, I.; Spanidis, Y.; Protogerou, V.; Troupis, T. Anatomical Variations of Human Vertebral and Basilar Arteries: A Current Review of the Literature. *Morphologie.* 2023;107(357)169-175.

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