

Anomalous Origin of Posterior Choroidal Artery from Basilar Artery

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Anatomic variations of the circle of Willis are common. Posterior cerebral arteries develop late in embryologic life and have numerous variations [1]. We demonstrated an anomalous origin of the medial posterior choroidal artery by angiography. Its embryogenesis and significance are discussed.

Case Report

A 52-year-old woman was admitted to the Veteran's Administration Hospital, Wood, Wisconsin with trigeminal neuralgia on the left side. Selective left internal carotid and left vertebral angiography was performed. The left posterior cerebral artery originated from the internal carotid artery. The posterior cerebral arteries were not opacified from the basilar. One medial posterior choroidal artery was a branch of the basilar artery (fig. 1). Both vertebral arteries were small. There were no aneurysms and no other anomalous vessels.

Discussion

In the 40 mm embryo, the trunk of the mesencephalic and diencephalic vessels form the stem of the future posterior cerebral artery. The posterior choroidal arteries are branches of the diencephalic trunk. In the adult, the posterior cerebral artery (whether it arises from the internal carotid artery or the basilar artery) normally gives origin to the posterior choroidal arteries [1, 2]. In about 40% of cases, the origin of the medial posterior

choroidal artery from the posterior cerebral artery is proximal to the posterior communicating artery [2, 3]. In the embryo, if the posterior choroidal artery origin is medial to the posterior communicating artery and the midposterior cerebral artery involutes, then the posterior choroidal artery will become a branch of the basilar artery (fig. 2). Bilateral origin of the posterior cerebral artery from the internal carotid artery with absent poste-

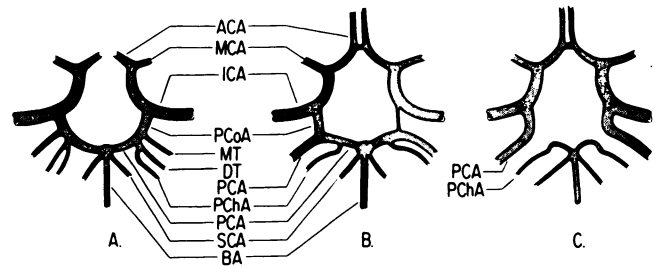


Fig. 2.—Development of anomalous posterior choroidal artery. **A**, 40 mm embryo. Lateral and medial posterior choroidal arteries (PChA) are branches of diencephalic trunk (DT). **B**, Adult. Posterior cerebral artery (PCA), which develops from diencephalic and mesencephalic (MT) trunks, may be branch of either internal carotid (ICA) or basilar artery (BA). Medial and lateral posterior choroidal arteries are branches of posterior cerebral artery unless **(C)** part of diencephalic trunk involutes after communication is developed between the diencephalic trunk and the basilar artery. (ACA = anterior cerebral artery; MCA = middle cerebral artery; PCoA = posterior communicating artery; SCA = superior cerebellar artery).

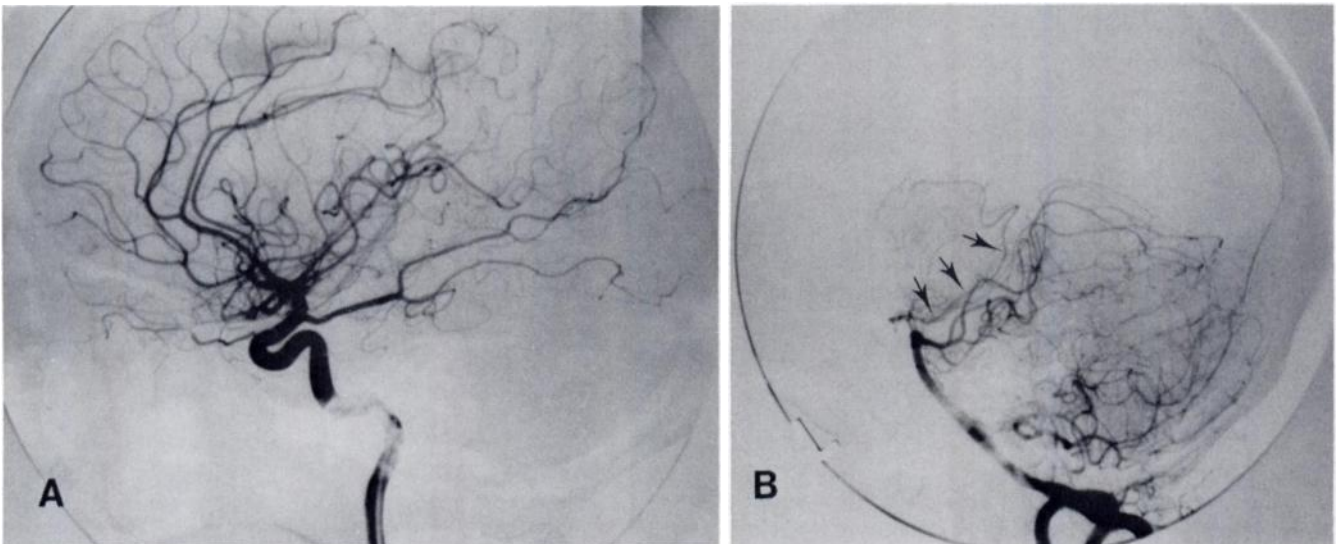


Fig. 1.—Anomalous posterior choroidal arteries. **A**, Left internal carotid artery injection. Posterior cerebral artery arises from internal carotid artery. **B**, Vertebral artery injection. Medial posterior choroidal artery (arrows) originates from basilar artery.

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rior communicating artery (fetal posterior cerebral artery) occurs in 0.25% of cases [2]. Therefore, anomalous origin of the posterior choroidal artery from the basilar artery occurs in less than 0.25%. In our case, the findings are incidental to the patient's clinical problem. Trigeminal neuralgia and hemifacial spasm may be associated with cranial nerve compression by various vessels [4]. However, to our knowledge, the anomalous posterior choroidal artery is not associated with trigeminal neuralgia.

In the presence of the anomalous posterior choroidal artery, a vertebral artery injection is necessary to demonstrate posterior choroidal circulation, despite good filling of the posterior cerebral artery from the carotid injection. Also, the anomalous posterior choroidal artery

arising from the basilar artery might provide collateral circulation in cases of carotid or basilar artery occlusion.

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