

Posterior communicating artery

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There are considerable [variations](#) in the anatomy of the Posterior communicating artery complex, which have both surgical and [endovascular](#) implications. The size of the PCOM artery ranges from a small artery often not visualized on [angiography](#), to a large artery nearly the size of the [posterior cerebral artery](#) (PCA).

A [Fetal posterior communicating artery](#) variant is defined as a PCOM artery, which has the same caliber as the P2 segment of the PCA and is associated with an atrophic P1 segment. Because fetal PCOM arteries are the primary supply to the PCA, care must be taken not to compromise flow to this artery during clipping or coiling of PCOM aneurysms. The incidence of the fetal PCOM variant is 4-29% of patients and bilateral fetal PCOM variants occur in 1-9% of patients ¹⁾.

The left and right posterior communicating arteries are arteries at the base of the brain that form part of the [circle of Willis](#). Each posterior communicating artery connects the three cerebral arteries of the same side. Anteriorly, it connects to the [internal carotid artery](#) (ICA) prior to the terminal bifurcation of the ICA into the anterior cerebral artery and middle cerebral artery. Posteriorly, it communicates with the posterior cerebral artery.

The brain is supplied with blood by the internal carotid arteries and also by the posterior cerebral arteries; the posterior communicating arteries connects the two systems. This provides redundancies or collaterals in the cerebral circulation so that, if one system is blocked or narrowed, the other can take over.



<http://www.hindawi.com/journals/ert/2012/769825/fig6/>

The medial view of the anterior segment of the [medial temporal region](#) (MTR). (This illustration correlates with Figures 6(b) and 6 ©).

The **anterior choroidal artery** (AChA) gives off an **anterior uncal artery** that irrigates the **semilunar gyrus** and an **uncohippocampal artery** that irrigates the **uncinate gyrus** and **band of Giacomini** and penetrates the **uncal sulcus** to vascularize the extraventricular hippocampal head. The **internal carotid artery** (ICA) gives off an anterior **uncal artery** that supplies the semilunar gyrus. This branch usually is present when the anterior uncal artery of the AChA is absent. An anterior uncal artery also arises from the M1 segment of the **middle cerebral artery** (MCA) and supplies the **ambient gyrus**. An **uncoparahippocampal artery** arises from the **temporopolar artery** and irrigates both the **ambient gyrus** and the anterior parahippocampal area. Branches from the P2a segment of the PCA irrigate the anterior parahippocampal region (anterior parahippocampal artery) or both the anterior parahippocampal gyrus and hippocampal head (anterior hippocampal-parahippocampal artery). (b) The medial surface of the anterior segment of the left MTR. The white arrow points the posterior end of the uncal notch. The anterior part of this segment is irrigated by middle cerebral branches (orange shaded area), the posterosuperior part is supplied by anterior choroidal branches (blue shaded area), and the posteroinferior part is vascularized by posterior cerebral branches (yellow shaded area). The ICA typically supplies the area supplied by the AChA and the MCA if their branches are absent. The branches of the MCA are the anterior uncal artery superiorly and the unco-parahippocampal artery inferiorly.

The branches of the AChA are the anterior uncal artery anteriorly, the posterior uncal artery posteriorly, and the unco-hippocampal artery posteroinferiorly.

The branches of the PCA are the anterior hippocampal-parahippocampal artery medially and the anterior parahippocampal artery laterally. Areas of vascular anastomosis are typically found at the confluence of vascular territories (curved arrows).

© The same view of (a) in a silicon injected anatomic specimen.

(d) Inferior view of the anterior segment of the left MTR.

The inferior lip of the posterior uncal segment has been removed to expose the extraventricular hippocampal head. The semilunar gyrus has been retracted to expose the branches of the AChA.

Two anterior uncal arteries arise from the first one-third of the AChA and irrigate the semilunar gyrus. A posterior uncal artery from the AChA penetrates the uncal sulcus and irrigates the extraventricular hippocampal head. An anterior hippocampal-parahippocampal artery arising from the anteroinferior temporal branch of the PCA gives rise to an anterior hippocampal branch that supplies the extraventricular hippocampal head and anastomoses with the unco-hippocampal branch of the AChA (green arrow).

(e) Lower surface of the anterior segment of the right MTR. The entorhinal area is irrigated medially by the parahippocampal branch of the anterior hippocampal-parahippocampal artery that arises from the P2a, and laterally by a large anterior parahippocampal artery that originates from the anterior inferior temporal artery.

A.: artery; A.C.A.: anterior cerebral artery;

A.Ch.A.: anterior choroidal artery;

Amb.: ambient; Ant.: anterior;

Car.: carotid;

Chor.: choroidal;

Dent.: dentate;

Entorhin.: entorhinal;

Giac.: Giacomini;

Hippo.: hippocampus;

ICA: internal carotid artery;

Inf.: inferior;

Intralimb.: intralimbic;

Lent.: lenticulo;

M.C.A.: middle cerebral artery;

M1.: M1 segment of middle cerebral artery;

Parahippo.: parahippocampal;

P.C.A.: posterior cerebral artery;

P2A.: anterior part of the P2 segment of posterior cerebral artery;

P2P.: posterior part of the P2 segment of posterior cerebral artery;

P.Co.A.: posterior communicating artery;

Ped.: peduncle;

Pol.: polar;

Semianul.: semiannular;

Semilun.: semilunar;

Str.: striate;

Sulc.: sulcus;

Temp.: temporal;

Tr.: tract;

Unc.: uncal;

Uncin.: uncinate;

V.: vein.

see [Fetal posterior communicating artery](#)

Posterior communicating artery aneurysm

See [Posterior communicating artery aneurysm](#)

¹⁾
Golshani K, Ferrell A, Zomorodi A, Smith TP, Britz GW. A review of the management of posterior communicating artery aneurysms in the modern era. Surg Neurol Int. 2010 Dec 22;1:88. doi: 10.4103/2152-7806.74147. PubMed PMID: 21206898; PubMed Central PMCID: PMC3011114.

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