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**Diversity among posterior thalamoperforating arteries: Future methods to visualize small cerebral vessels *in vivo***

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**Introduction & Aim:** The P1 segment of the Posterior Cerebral Artery (PCA) begins at the termination of the basilar artery and ends at the origin of Posterior Communicating Artery (PCoM), within the interpeduncular cistern. Perforating branches are a crucial component of cerebrovascular system supplying the posterior part of the thalamus, subthalamus, hypothalamus, substantia nigra, perforated substance, posterior part of internal capsule and the nucleus of III and IV cranial nerve. The aim is to determine the morphometry of posterior thalamo perforating arteries and allow a better understanding of their branching patterns and relation to basilar artery.

**Method:** An extensive search was undertaken in order to identify published literature related to the posterior cerebral circulation system and the anatomy of posterior thalamoperforating arteries using keywords. Medline, Embase, Ovid and Google Scholar databases were searched for publications dated from 1970 until July 2016.

**Result:** Thirteen (13) cadaver studies were analyzed and the data was extracted. We focused on the mean number of branches arising from P1 segment, perforators range and mean diameter of perforating branches, largest diameter of perforating branches.

**Conclusion:** Mean number of branches per hemisphere was 2.91. In more than half of analyzed study's authors did not find any presence of posterior thalamoperforating arteries. Mean diameter of those perforators was 0.51 mm. Average distance from basilar artery bifurcation was 2.29 mm. There were many branching patterns presented by different authors. Ultra high field MRA allows to visualize second and third order cerebral branches *in vivo* without administrating contrast agent. It can be a future method to study small cerebral and displace cadaver studies.

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