

## The Termination of Bilateral Posterior Communicating Arteries at the Basilar Top

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### ABSTRACT

We reported a case of bilateral posterior communicating arteries terminate at the basilar top. No such case has previously been reported.

**Key words:** Posterior communicating artery; Basilar top; MRA; PCA

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### CASE REPORT

A 66-year-old woman with a history of malignant lymphoma was receiving medication for hypertension. She visited our hospital for an initial medical checkup of the brain. Brain magnetic resonance imaging (MRI) showed only a few white matter lesions. Carotid sonography and cervical X-ray showed normal findings. Brain magnetic resonance angiography (MRA) showed that the bilateral posterior communicating arteries (p-coms) originated from each internal carotid artery; however, the bilateral p-coms terminated at the basilar top. The bilateral posterior cerebral arteries (PCAs), superior cerebellar arteries and basilar artery were all normal, so these arteries, including the p-coms, formed a seven-way intersection at the basilar top. No other abnormalities were observed.

### DISCUSSION

The p-coms usually originate from the internal carotid artery and terminate at the PCAs. The PCA first segment extends from the proximal portion of the PCA until p-com termination. The PCA second segment extends to the distal portion of the PCA from p-com termination. P-coms show many normal variations, such as an absence, variable size and termination. Therefore, the PCA first segment also has a number of normal variations, such as an absence, variable size and length. Some studies have investigated the anatomical variations of the p-coms. These investigations involved post-mortem autopsies, computed tomographic angiography and MRA<sup>[1-3]</sup>. Most studies only analyzed the presence and size of the p-coms. Only Gunnal et al. reported p-com termination based on the autopsy findings of 170 patients<sup>[4]</sup>. In most patients (92.9%), the p-coms normally terminated at PCA. In only 2 patients (1.2%), the p-coms terminated at the basilar top; however, these p-com terminations were found only on the left side. Other p-com variations, including fenestration, loop formation, or direct perfusion at the PCA area without fusion with the PCA, were observed in only a few patients. In the present case, the PCA was completely excluded from the circles of Willis. Because the p-coms do not connect to the PCA, it is therefore not possible to separate PCA into P1 and P2. To our knowledge, no such case has previously been reported. Our patient received a brain checkup, so no examinations beyond brain MRI and MRA were performed. In direct neurosurgery or intravascular



Figure 1 MRA of the case (2 views from different angles, volume rendering 3D reconstructed images)

neurosurgery, neurosurgeons and neuroradiologists should be familiar with the normal variants of the cerebral arteries. Although our case is one of a rare variant, we reported it because no similar cases had been previously reported.

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