Variant Anatomy of the Basilar Artery: A Pictorial and Educational Neuroimaging Review

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Normal Basilar Anatomy

Fetal Cerebral Blood Supply

Fetal Carotidobasilar Anastomoses

Persistent Hypoglossal Artery

Persistent Proatlantal Artery

Persistent Otic Artery

The OA is the first fetal carotidobasilar anastomosis to regress, and therefore the least likely to persist to adulthood; but is described to arise from the petrous ICA and course through the internal auditory canal to anastomose with the BA. With only a single reported case, the persistent OA is a controversial entity of questionable clinical significance.

Basilar Fusion Variants

Distal Basilar Fenestration

Proximal Basilar Fenestration

Distal Basilar Fenestration Blister Aneurysm

Proximal Basilar Fenestration Saccular Aneurysm

Basilar Apex Variants

Anomalies of the basilar apex result from variant initial fusion of the LNAs to form the BA. Normal congruence of the LNAs at initial fusion result in the most common apex variants, bifurcation (2) and quadrifurcation (4), while incongruence results in the less common asymmetric apex variants, nonfurcation (1), trifurcation (3), and pentafurcation (5).⁶

1: **Basilar Nonfurcation:** 3D volume rendered coronal PA CTA demonstrating a single left PCA arising as a continuation of the distal BA. Nonfurcation results from asymmetric LNA fusion and unilateral PCA aplasia, and is the rarest apex variant.

2: **Basilar Bifurcation:** Coronal MIP MRA demonstrating a normal basilar bifurcation, the most common apex type, in which there are separate and symmetric PCA origins from the basilar apex.

3: **Basilar Trifurcation:** Coronal MIP MRA demonstrating a basilar trifurcation, in which there is an absent right PCA and adjacent but separate origins of the left PCA and SCA. Note an incidental right SCA duplication distal to the origin.

4: **Basilar Quadrifurcation:** Coronal MIP MRA demonstrating a basilar quadrifurcation, in which there is a common site of origin for the bilateral PCAs and SCAs without a common trunk.

5: **Basilar Pentafurcation:** Coronal MIP MRA demonstrating a duplicated left SCA and branching of the bilateral PCAs and SCAs from nearly the same point at the distal basilar.