

Azygos anterior cerebral artery

An azygos [anterior cerebral artery](#) is an uncommon to rare variant of the [circle of Willis](#) where the two [A1 segment of the anterior cerebral artery](#) (ACA) join to form a single trunk. As a result, there is no [anterior communicating artery](#). This organization is similar to that seen in lower primates ¹⁾

Epidemiology

They are present in approximately 0.4-1% of the population ²⁾.

Classification

The classification of azygos anterior cerebral artery (ACA) is based on the specific anatomical variations observed. Different classifications have been proposed to describe the variations in the azygos ACA. Here are a few commonly used classifications:

Al-Rodhan classification:

Type I: Complete absence of one ACA with contralateral ACA supplying the territory of the missing ACA. Type II: Hypoplastic ACA with ipsilateral posterior cerebral artery (PCA) supplying the territory of the missing ACA. Type III: Hypoplastic ACA with contralateral ACA supplying the territory of the missing ACA. Type IV: Complete absence of both ACAs with bilateral PCAs supplying the territories of the missing ACAs. Yasargil classification:

Type A: Complete absence of one ACA with contralateral ACA supplying the territory of the missing ACA. Type B: Azygos ACA with contralateral ACA supplying the territory of the missing ACA, but the ACoA is present. Type C: Azygos ACA with contralateral ACA supplying the territory of the missing ACA, and the ACoA is absent. Lasjaunias and Berenstein classification:

Type I: Complete absence of one ACA with contralateral ACA supplying the territory of the missing ACA. Type II: Azygos ACA with contralateral ACA supplying the territory of the missing ACA and the ACoA is present. Type III: Azygos ACA with contralateral ACA supplying the territory of the missing ACA and the ACoA is absent. These classifications help in describing and categorizing the variations observed in the azygos ACA. They assist in understanding the vascular anatomy and potential implications during diagnostic and therapeutic procedures.

Pathology

Associations It is associated with numerous abnormalities, including ³⁾

dysgenesis of the corpus callosum

lobar holoprosencephaly ⁴⁾

septo-optic dysplasia

porencephalic cysts

arteriovenous malformations (AVM)

Berry aneurysms are often seen at the eventual bifurcation of the single vessel, due to either altered hemodynamics or congenitally abnormal wall, or both. The reported incidence varies widely, from 13 to 71%⁵⁾.

As there is frequent hypoplasia of the anterior communicating artery and supply of the medial surface of the hemispheres by contralateral ACA branches, confirmation of an azygos ACA can be difficult on angiography⁶⁾

Cross compression views can be helpful.

Case reports

A woman suspected to have an [anterior cerebral artery aneurysm](#) that was ultimately found to have an azygous ACA shield. This benign entity highlights the importance of thorough investigation with cerebral [digital subtraction angiography](#) (DSA). This 73-year-old female initially presented with [dyspnea](#) and [dizziness](#). [Computed tomography angiography](#) of the head suggested an incidental 5 mm [anterior cerebral artery aneurysm](#). Subsequent [DSA](#) demonstrated a Type I azygos ACA supplied by the left [A1 segment of the anterior cerebral artery](#). Also noted was a focal dilatation of the [azygos trunk](#) as it gave rise to the bilateral pericallosal and [callosomarginal artery](#). Three-dimensional visualization demonstrated a benign dilatation secondary to the four vessels branching; no [aneurysm](#) was noted. Incidence of aneurysms at the distal dividing point of an azygos ACA ranges from 13% to 71%. However, careful anatomical examination is imperative as findings may be a benign dilatation for which case intervention is not indicated⁷⁾

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