

Monkey's type of anterior cerebral artery mimicking aneurysm: CT angiography findings

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ABSTRACT

We present a case of azygos pericallosal artery mimicking an anterior communicating artery aneurysm in a patient with headache that we thought the first reported case detected by CT angiography. *Neuroanatomy*; 2006; 5: 27–29.

Key words [anterior cerebral artery] [angiography] [CT] [aneurysm] [azygos pericallosal artery]

Introduction

Anterior cerebral artery (ACA) is one of the two terminal branches of internal carotid artery that supplies orbitofrontal and medial hemispheric portions of the brain. ACA is topographically and angiographically divided into a *precommunicating* (A1) and a *postcommunicating* (A2, also called as pericallosal artery) parts. An *azygos* (occurring singly) *pericallosal artery* in one of the most frequent anomalies of the distal ACA [1]. It can be easily identified when gross examination is made, however even conventional angiographic distinction may sometimes be difficult. An azygos pericallosal artery is also a risk factor for distal anterior cerebral artery aneurysm due to hemodynamic vulnerability [2]. Herein we present a case of azygos pericallosal artery mimicking the anterior communicating artery aneurysm on enhanced cranial computed tomography.

Case Report

31 year-old female patient suffering chronic headache was requested cranial computed tomography examination upon worsening. Her past medical history was totally unremarkable. Cranial computed tomography examinations before and after contrast medium administration have been found to be within normal limits except an extra enhanced structure which we thought to be an anterior communicating artery aneurysm on enhanced sections (Fig. 1). Then we performed a cerebral CT angiography in an 8 channel multidetector CT suite (GE medical systems, Milwaukee WI, USA)

after intravenous administration of 100 ml nonionic contrast medium. Raw data as well as multiplanar 2D and 3D reconstructed images all demonstrate the azygos anomaly of the pericallosal artery with no demonstrable aneurysm neither at the anterior communicating artery site nor distal anterior cerebral artery (Figs. 2, 3). The azygos pericallosal artery was exceeding 3.5 mm in mean diameter, that means being bigger in size than both A1 segments and terminating at the level of genu of corpus callosum. Upon these findings, a subsequent digital subtraction angiography examination has become obsolete.

Discussion

The azygos pericallosal artery is rather common in lower primates, but is seen in 0.2–3.7% of humans. That was the reason why Belenkaya et al referred to this anomaly as a *monkey's type of ACA* [3].

According to a classification regarding variations in anterior cerebral arteries and cortical branches made by Baptista; azygos pericallosal artery is one of four patterns being pattern I: the normal common pattern, pattern II: an accessory artery (or third A2 segment also called as median callosal artery), pattern III: the azygos trunk and pattern IV: bihemispheric distribution of cortical branches [4].

Marinkovic et al reported a short azygos trunk bifurcated at the level of genu and a long trunk running almost the entire length of corpus callosum. In the literature there



Figure 1. Enhanced axial computed tomography. *Arrow* indicating the enhanced structure in the interhemispheric fissure resembling an anterior communicating artery aneurysm.

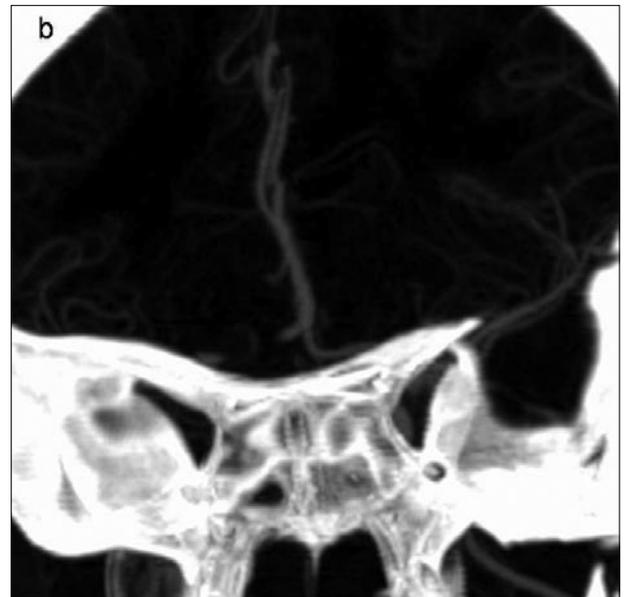
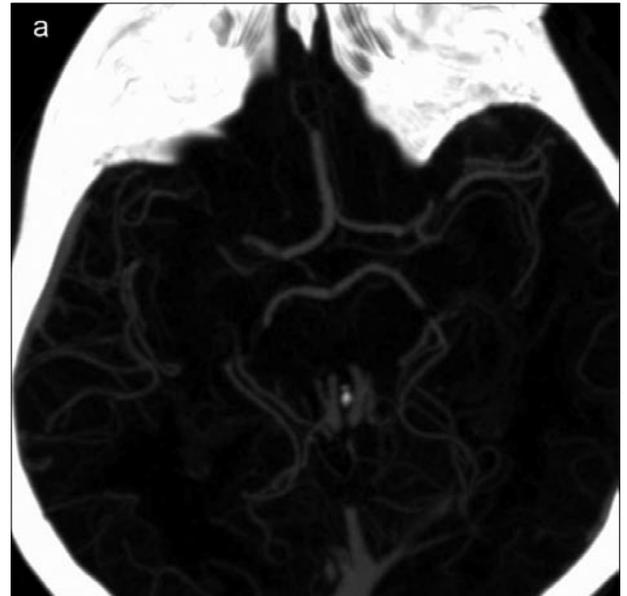


Figure 2. Axial (*a*) and coronal (*b*) maximum intensity projection (MIP) reformatted sections.

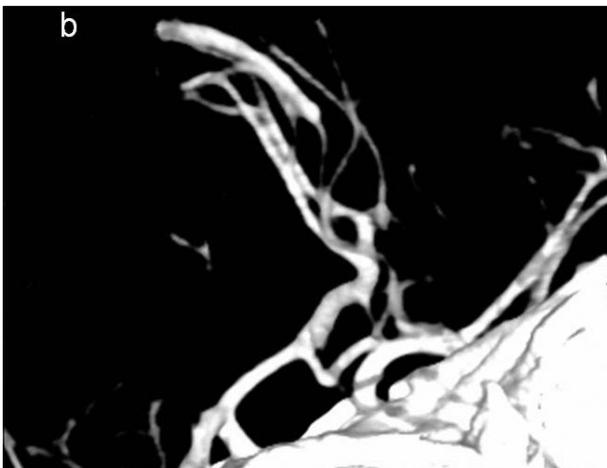
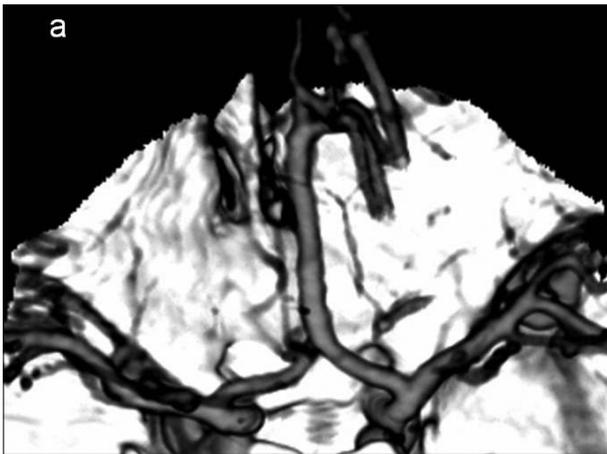


Figure 3. 3D volume rendered images. View from above (*a*) and right anterior oblique (*b*).

were several cadaver and patient reports mentioning the diameter of the pericallosal artery as greater than or at least equal to that of each A1 segments [1].

The clinical significance of azygos pericallosal artery lies in the fact that it may be associated with certain midline connection malformations like holoprosencephaly and distal ACA aneurysms. Szdzuy et al reported three angiographic observations of a long common trunk together with agenesis of corpus callosum, meningoceles and porencephalic cysts [5].

Simon et al found this anomaly in 16 cases of a malformation suggestive of holoprosencephaly [6]. Katz et al described a 48-year old with a fusiform aneurysm of an azygos pericallosal artery with a ruptured saccular aneurysm at distal end [7]. Kondo et al also reported a saccular aneurysm of an azygos pericallosal artery [8].

Miyazawa et al published small series of distal ACA aneurysm associated with azygos pericallosal artery [9]. Clinical importance of the azygos pericallosal artery depends on thromboembolic complications and surgical approach to ACA aneurysms. However when it reaches a considerable size it may itself mimic an aneurysm

as in our patient. In the literature we couldn't find any report describing this aspect. Our case also represents the first definition of this rather common anomaly by CT angiography in the literature that emphasizes the value of noninvasive CT angiography to avoid unnecessary digital subtraction angiography in such a case.

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