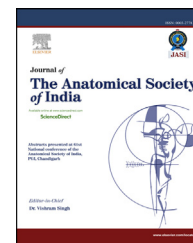


Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jasi

Original Article

Magnetic resonance angiographic investigation of azygous *alias* monkey type anterior cerebral artery – Incidence and clinical significance



Ketu Chauhan ^{a,*}, Arvind Yadav ^a, Archana Sharma ^b, Satyam Khare ^c,
G.L. Nigam ^d

^a Lecturer, Department of Anatomy, LLRM Medical College, Meerut, UP, India

^b Professor, Department of Anatomy, LLRM Medical College, Meerut, UP, India

^c Head, Department of Anatomy, Subharti Medical College, Meerut, India

^d Assistant Professor, Department of Anatomy, LLRM Medical College, Meerut, UP, India

ARTICLE INFO

Article history:

Received 19 March 2014

Accepted 31 July 2014

Available online 31 August 2014

Keywords:

Azygous aca

Aneurysm

Congenital cerebral malformations

ABSTRACT

Introduction: Azygous anterior cerebral artery (ACA) is one of the extremely rare variant occurring in the A2 segment of ACA, where the bilateral A1 segments unite together to form a single midline trunk. This trunk supplies both ACA territories. It has been also referred to as the unpaired pericallosal stem artery, unpaired anterior cerebral artery, common anterior cerebral trunk and azygos pericallosal artery.

Method: 1.5 T (GE OPTIMA MR 360) was used for obtaining the angiographs, 114 MRA were reviewed, 90 male and 24 female, aged between 20 and 75 years.

Result: The Azygous type anterior cerebral artery was present in (3.5%), in (1.75%) a long trunk depicting the classical Azygous anterior cerebral artery was present, while in (1.75%) a short median stem was present.

Discussion: This type of presentation is a risk factor for development of aneurysm in distal part of ACA due to alteration of hemodynamics, sometimes this variation may be associated with vascular or nonvascular neurological anomalies like arteriovenous malformations, defects of septum pellucidum, Holoprosencephaly, meningocele.

Copyright © 2014, Anatomical Society of India. Published by Reed Elsevier India Pvt. Ltd. All rights reserved.

1. Introduction

Anterior cerebral artery (ACA) is one of the two terminal branches of internal carotid artery that supplies medial surface of each cerebral hemisphere, superior to the corpus callosum

and extends posteriorly up to the parieto-occipital sulcus.¹ Topographically and surgically it is divided into A1–A5 segments. The part between its origins from the internal carotid artery up to anterior communicating artery (ACoA) is called the A1 segment or proximal ACA or pre-communicating segment, whereas the segment after the ACoA has been called the distal

* Corresponding author. Tel.: +91 9760887487.

E-mail address: chauhanketu@gmail.com (K. Chauhan).

<http://dx.doi.org/10.1016/j.jasi.2014.07.002>

0003-2778/Copyright © 2014, Anatomical Society of India. Published by Reed Elsevier India Pvt. Ltd. All rights reserved.

ACA or the post communicating or the pericallosal artery (PerA).² The latter has been divided into 4 parts: the A2 segment, extends from the ACoA to the rostrum of the corpus callosum (CC), the A3 segment extends from previous point to the genu of the CC, the A4 segment extends from the previous point to the line where the CC intersects laterally with the coronal suture; and the A5 segment extends from previous point to the splenium of the CC.³ One of the extremely rare variant occurring in the A2 segment is the Azygous ACA, where the bilateral A1 segments unite together to form a single midline trunk. This trunk supplies both ACA territories. In the available literature it has been also referred to as the unpaired pericallosal stem artery, unpaired anterior cerebral artery, common anterior cerebral trunk and azygos pericallosal artery. Such a vascular malformation may be associated with other vascular or nonvascular neurological anomalies. This type of presentation is a risk factor for development of distal anterior cerebral artery aneurysm due to hemodynamic vulnerability.⁴ Due to the important clinical implications this study was undertaken to find its incidence in this part of population and also make a comparative study with the similar studies done in the other parts of the world so as to ascertain if there is any geographical and racial predisposition.

2. Material and method

At the beginning of this study, approval from the research ethics committee was obtained. The population of this study was formed by patients who underwent MRA for investigations like metastasis, epilepsy, acute or chronic headache and where the apparent cause was not cerebrovascular disease. 114 MRA were reviewed. Of the 114 subjects 90 were male and 24 female, aged between 20 and 75 years. 1.5 T (GE OPTIMA MR 360) was used for obtaining the angiographs using three dimensional time of flight technique. Maximum intensity projection (MIP) images and native source images were reviewed.

3. Result

In 4 cases Azygous variant of anterior cerebral artery was observed. In 2 cases it was classical Azygous type (Fig. 1) forming a long midline trunk, and the diameter of this midline trunk was 2.2 mm, which was more than the A2 segments (1.8 mm on the right side and 1.5 mm on the left side). This common trunk traversed around the genu of corpus callosum, and at the level of its upper border tetra furcated (Fig. 2). In 2 cases the azygous trunk was short and it further divided into two arteries (Fig. 3), here also the diameter of the single trunk formed was more than the individual A1 segments.

4. Discussion

The prefrontal cortex is less developed in fish, reptiles and amphibians and there is absence of anterior communicating artery, the two anterior cerebral arteries run parallel to each other. The Azygous ACA is common in lower primates but rare

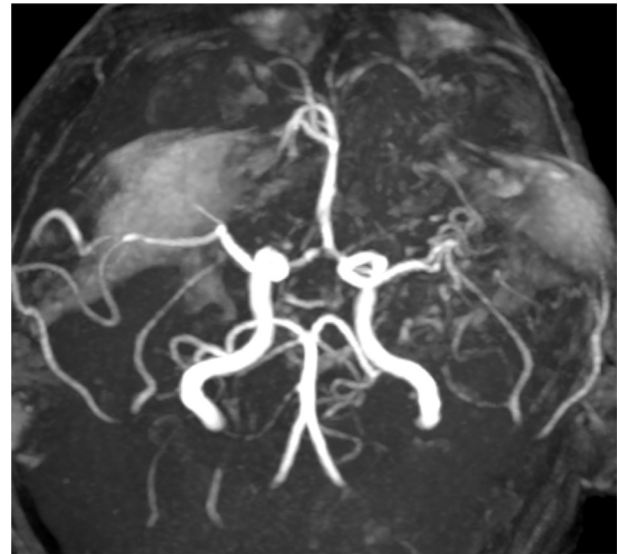


Fig. 1 – PA projection of CoW angiogram showing Azygous ACA.

in humans (0–10%). In chimpanzees the ACA's unite to form a median trunk which courses towards the rostrum of CC, depicting an Azygous ACA.⁵ Belenkaya et al had referred to this anomaly as a *monkey's type* of ACA.⁶ Wilder in 1885 for the first time introduced the term *arteria termatica* for the single median artery formed by the confluence of bilateral A1 segments.⁷ Baptista⁸ described three types of anomaly occurring in the distal part of the anterior cerebral artery: Type 1 – an unpaired anterior cerebral artery, in which a single anterior cerebral artery feeds both cerebral hemispheres. Type 2 – a bihemispheric anterior cerebral artery where both right and left anterior cerebral arteries are present, but one is rudimentary and most of the major branches to both hemispheres arise from the dominant one. Type 3 – a triple anterior cerebral artery with the accessory anterior cerebral artery arising from the anterior communicating artery. Our cases were judged to belong to Type 1. The azygous type anterior cerebral artery was present in 4 cases (3.5%), this is in agreement with the study by previous authors.^{2,6,9} Osborn et al¹⁰ has reported

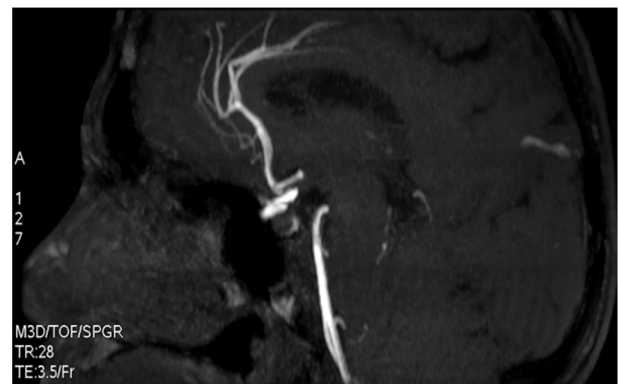


Fig. 2 – Sagittal MIP showing Azygos anterior cerebral artery.

Download English Version:

<https://daneshyari.com/en/article/3142137>

Download Persian Version:

<https://daneshyari.com/article/3142137>

[Daneshyari.com](https://daneshyari.com)