Article published online: 2022-09-14

Case Report

# Aneurysm of Anterior Inferior Cerebellar Artery-posterior Inferior Cerebellar Artery Variant


## Abstract

Aneurysms arising from anterior inferior cerebellar artery-posterior inferior cerebellar artery (AICA-PICA) variant are extremely rare. They usually present with subarachnoid hemorrhage. This is probably the second case report of a large thrombosed AICA-PICA variant aneurysm presenting as a cerebellopontine angle mass lesion with cranial nerve palsy, managed successfully by surgical clipping.


**Keywords:** *Aneurysm, anterior inferior cerebellar artery, clipping, posterior inferior cerebellar artery*


**Khursheed Ahmad Ansari, Girish Menon[1], Suresh Nair[1], Mathew Abraham[1]**

*Department of Neurosurgery, Wockhardt Hospitals, The Umrao Institute of Medical Sciences and Research, North Mumbai, Maharashtra, [1]Department of Neurosurgery, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala, India*


## Introduction

Anterior inferior cerebellar artery-posterior inferior cerebellar artery (AICA-PICA) variant is a well-known vertebrobasilar circulation anomaly, in which a common trunk from the basilar artery (BA) or the distal vertebral artery (VA) supplies blood to both their territories, as well as to the brainstem. Aneurysms arising from AICA-PICA variant are extremely rare. We present a unique case of a large thrombosed aneurysm presenting as a cerebellopontine (CP) angle mass lesion and managed successfully by surgical clipping.

## Case Report

A 26-year-old lady presented with chief complaints of vertigo and numbness over the right half of the face for 1 month. On neurological examination, she had minimal sensory loss over the right half of the face. Magnetic resonance images and computer tomography (CT) scanning revealed a well-defined extra-axial lesion in the right CP angle cistern measuring 18 mm × 18 mm × 15 mm [Figure 1a and b]. The right vertebral cerebral angiogram showed a common vascular trunk (AICA-PICA variant) arising from the vertebro-BA junction and supplying both the AICA and the PICA territory [Figure 1c-f]. A large partly thrombosed saccular aneurysm was seen arising from the meatal segment with a patent lumen measuring 11 mm × 8 mm. Rest of the cerebral vasculature was normal. The patient underwent a right retrosigmoid suboccipital craniotomy, and clipping of the aneurysm. The aneurysm was large, saccular, thrombosed, and was seen arising from the loop at the meatal segment. Aneurysm wall was adherent with the brainstem and was seen displacing the fifth cranial nerve above and VII, VIII$^{th}$ nerve complex below and posteriorly. There were no perforators or branching vessels arising from the site of an aneurysm. After initial tentative clipping, the sac was opened, thrombectomy was done, and the clip repositioned to reconstruct the normal vascular anatomy. Immediate postoperative period, she developed lower motor neuron type facial paresis, which improved in 4 weeks' time. Her facial numbness completely resolved in the postoperative period. Postoperative, CT angiogram confirmed successful clipping with no residual neck.

## Discussion

Anatomical variations of the AICA and the PICA are well-known. They are classified into four types, according to their origin and distribution of blood supply.[1] Type I is a single trunk originating from proximal BA, with 2 peripheral branches that act as an AICA and PICA. Type II is a bifid PICA, originating from an intradural segment of VA. Type III is a bifid PICA,



**How to cite this article:** Ansari KA, Menon G, Nair S, Abraham M. Aneurysm of anterior inferior cerebellar artery-posterior inferior cerebellar artery variant. Asian J Neurosurg 2018;13:53-5.


***Address for correspondence:***
*Dr. Khursheed Ahmad Ansari, Wockhardt Hospitals, The Umrao Institute of Medical Sciences and Research, Mira Road, North Mumbai - 401 107, Maharashtra, India.*
*E-mail: drkhursheed@rediffmail.com*



**Access this article online**

**Website:** www.asianjns.org

**DOI:** 10.4103/1793-5482.180935

**Quick Response Code:**

originating from vertebrobasilar junction, and Type IV is a PICA without an AICA. Depending on its origin, the AICA-PICA covers different territories. Aneurysms arising from the AICA-PICA variant are extremely rare; there are only 6 case reports so far available in literature [Table 1]. They are usually small saccular aneurysm and presents with bleed. Five aneurysms were treated with surgical clipping, 5 cases in 1 study were treated with endovascular coiling, and in one recently published article aneurysm was treated with trapping and surgical thrombectomy[2] [Table 1]. Indication of surgical clipping verses endovascular coiling or trapping and thrombectomy may vary from case to case,

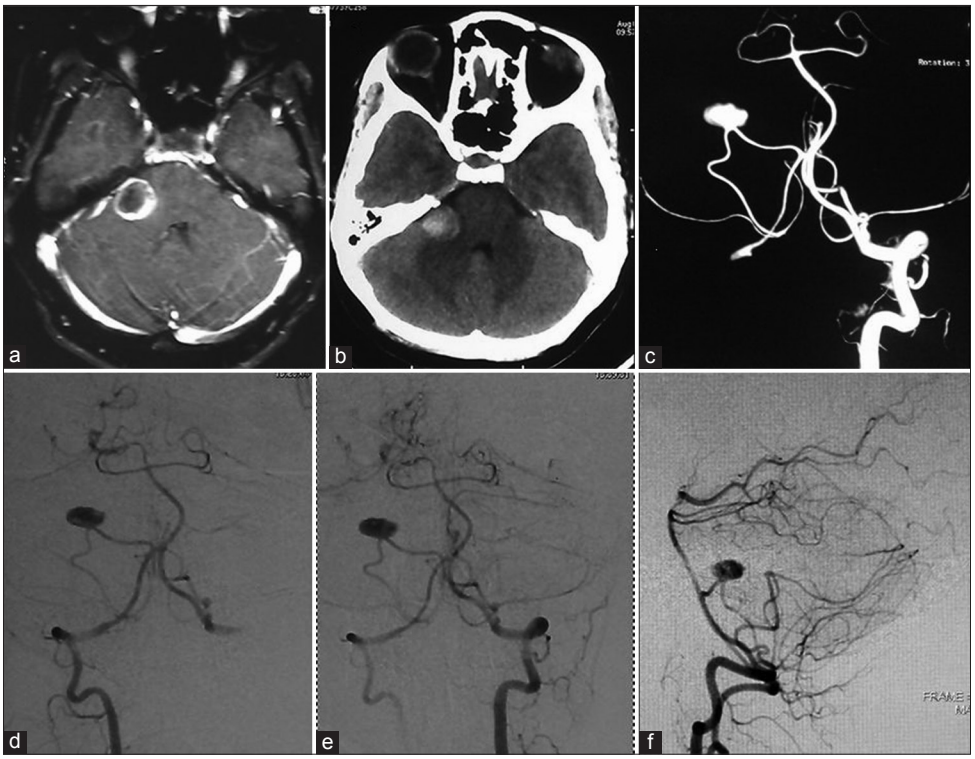


**Figure 1: Preoperative images (a) gadolinium enhanced magnetic resonance image of brain; (b) plane computer tomography scan brain showing cerebellopontine angle mass lesion, vertebral angiogram; (c) three-dimensional reconstructed image; (d and e) posterior view; (f) lateral view**

**Table 1: Review of the literature of AICA-PICA variant aneurysms**

| Authors and year | Number of cases | Age in year/sex | Presentation | Location | Size | Origin of trunk | Treatment | mRS |
|---|---|---|---|---|---|---|---|---|
| Ebara *et al.*,[3] 1999 | 1 | 62/female | SAH | Distal | Small | BA | MSOC and C | 0 |
| Baskaya *et al.*,[4] 2006 | 1 | 44/female | SAH | Distal | Small | BA | MSOC and C | 2 |
| Gopalakrishnan *et al.*,[5] 2009 | 2 | 68/female | SAH | Distal | Small | BA | MSOC and C | 4 |
| | | 63/female | SAH | Distal | Small | BA | RMSOC and C | 0 |
| Suh *et al.*,[6] 2011 | 5 | 67/female | SAH | Proximal | Small | * | Endovascular coiling for all cases | 1 |
| | | 71/female | SAH | Proximal | Small | | | 0 |
| | | 66/female | Incidental | Proximal | Small | | | 0 |
| | | 72/female | Incidental | Proximal | Small | | | 0 |
| | | 46/female | SAH | Proximal | Large (15 mm maximum) | | | 1 |
| Ooigawa *et al.*,[2] 2015 | 1 | 42/male | Mass effect | Distal | Approximately 3 cm | BA | Endovascular trapping and surgical thrombectomy | 1 |
| Current case | 1 | 26/female | Mass effect | Proximal | Large (18 mm maximum) | VA | RMSOC and C | 0 |

*Not available. BA – Basilar artery; mRS – Modified Rankins score; MSOC and C – Midline suboccipital craniotomy and clipping; RMSOC and C – Retromastoid suboccipital craniotomy and clipping; VA – Vertebral artery; AICA-PICA – Anterior inferior cerebellar artery-posterior inferior cerebellar artery; SAH – Subarachnoid hemorrhage

based on the overall anatomy of posterior fossa circulation and morphology of an aneurysm. This is probably a first case of a large thrombosed aneurysm arising from proximal AICA-PICA, presented like CP angle syndrome and managed surgically.

Aneurysms arising from an AICA-PICA variant can pose a considerable challenge. It is important to be aware of this variant in advance during lateral suboccipital or far lateral approach. Particularly in Type I circulation, where usually AICA is dominant and supplies brainstem, inadvertent injury to these perforators can give rise to brainstem infarct.[6] An aneurysm seen in Type IV anomaly is often not associated with definitive branching site. The etiopathogenesis of these aneurysms could be due to either hemodynamic stress at bending site or a silent dissection. Aneurysms arising from the PICA are usually seen in the distal segments, and a median suboccipital approach generally suffices. In this case since aneurysm was located in CP angle cistern, we utilized a retrosigmoid approach. The endovascular treatment should be differed in such cases (Type IV) since patient presented primarily due to mass effect, and inadvertent injury to this trunk during endovascular treatment would have caused major posterior fossa stroke. However, we feel more studies are required to ascertain this observation.

## Conclusion

This is a unique case of a large thrombosed AICA-PICA aneurysm presenting as a CP angle mass lesion with cranial nerve deficit. It is important to be aware of this variant, while investigating a patient with CP angle mass lesion. Cerebral digital subtraction angiogram is mandatory for evaluation of such variants. Surgical clipping and thrombectomy alleviate symptoms related to mass effect.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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