

## Rare Bilateral Aberrant Internal Carotid Artery Diagnosed on Digital Subtraction Angiography-A New “Eye Hook Sign”

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### Abstract

We proposed a new “eye hook sign” to diagnose bilateral aberrant ICA in 15-years-old male on digital subtraction angiography. This finding is important to recognise to avoid any complication during the biopsy and surgery.

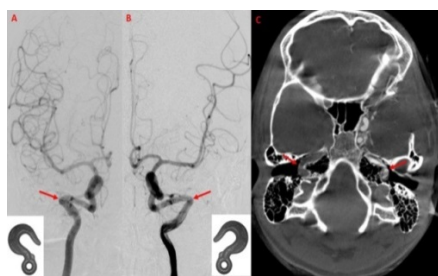
**Keywords:** Aberrant internal carotid artery; Eye hook; Angiography; Aneurysm

### Introduction

An aberrant internal carotid artery has been well described in the literature and is a rare congenital vascular anomaly of middle ear. It is important to diagnose this congenital anomaly on angiography as misdiagnosis may have disastrous consequences [1-3]. We present a case of bilateral aberrant ICA in 15-years-old male and proposed a new “eye hook sign” to diagnose this anomaly on Digital Subtraction Angiography (DSA) which can be useful to the literature.

### Case Report

A 15-years-old male, known post-operative case of left decompressive craniectomy for acute left gangliocapsular bleed due to ruptured lenticulostriate artery aneurysm. It was successfully treated with endovascular coiling.



**Figure 1:** (A, B) Cerebral angiography, bilateral internal carotid injections showed aberrant bilateral ICA (red arrow) evidence by “eye hook” like turn of petrous ICA projecting laterally and then taking an acute angle turn to course medially. The characteristic “eye hook” like turn of petrous ICA (Image box). (C) Dyna computed tomography angiography was done with left ICA injection which revealed bilateral ICA running through the middle ear cavity with absence of bony plate between the carotid canal and tympanic cavity (red arrow).

Digital Subtraction Angiography (DSA) was done after 6 months which revealed no evidence of aneurysm and vascular malformation. There was an aberrant bilateral Internal Carotid Artery (ICA) detected on DSA which had a characteristic course of petrous ICA projecting laterally and then taking an acute angle turn to course medially (Figures 1A and B). Right ICA course was also well delineated on dyna CTA (Figure 1C). The patient had no symptom related to this anomalous variation.

### Discussion

Aberrant ICA also known as aberrant intratympanic ICA is a rare anomaly in which ICA takes an anomalous course and passes through the middle ear in the temporal bone. This anomaly is associated with bone plate absence between the carotid canal and tympanic cavity [1]. Embryogenesis of ICA has been discussed by many authors [1-5]. The most accepted hypothesis for the development of aberrant ICA was described by Lasjaunias and Santoyo-Vazquez [5]. They have proposed the alternate blood flow theory in which there is involution of C1 portion of ICA due to persistent of pharyngeal artery system. Thus, an anastomosis develops between inferior tympanic branch of the ascending pharyngeal artery and caroticotympanic artery of the ICA. The rare occurrence of bilateral aberrant ICA has been also reported by few authors [2,3]. Aberrant ICA can be easily recognised on the cross-sectional imaging including high resolution temporal bone Computed Tomography (CT) scanning, CT carotid angiography and Magnetic resonance angiography. The main radiological findings are lateral abnormal course along the medial wall of middle ear, attenuation of the carotid artery, absent cranial opening of carotid canal and absence of bone plate between the carotid canal and tympanic cavity [1,3,5]. Recognition of aberrant ICA on digital subtraction angiography has not well studied in the literature and is important to diagnose this anomaly on DSA to avoid misdiagnosis. There is a vestibular line described by Lapayowker et al. [4] drawn vertically on an anteroposterior arteriogram through the lateral aspect of the vestibule. Aberrant ICA is considered if any part of the ICA lies lateral to this line. In our case, we proposed a new sign on digital subtraction angiography, posterior anterior view to diagnose aberrant ICA (Figures 1 A and B, image box) which is recognised by its characteristic “eye hook” like turn of petrous ICA projecting laterally and then taking an acute angle turn to course medially. Lateral course of ICA and its reduced diameter of tympanic ICA to diagnose this anomaly has also

been described in the literature [2,4]. It is very important to recognise the aberrant intratympanic ICA on angiography to avoid catastrophic event during surgery and biopsy. Thus, a characteristic new “eye hook sign” like appearance of ICA on DSA may contribute to the literature to easily diagnose the aberrant ICA anomaly.

### Conflict of Interest

None

### References

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