Agenesis of Internal Carotid Artery associated with Generalized Epilepsy: a case report

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INTRODUCTION

Agenesis of Internal Carotid Artery (ICA) is a rare congenital malformation . Approximately 150 cases have been described, with a prevalence of 0.01% (including hypoplasia and aplasia). In some rare cases this anomaly has been linked to seizures. The patients often remain asymptomatic for a long period of time because they develop appropriate collateral through the circle of Willis and the persistence of embryonic arteries

CASE REPORT

We describe a case of a 27 years-old young male, with a slight delay in psychic development (8 years of schooling) who was hospitalized for generalized seizure.

He performed a carotid ultrasound doppler that showed the absence of left ICA from carotid bulb. Transcranial Doppler ultrasound showed left-hand hemodynamic compensation through the anterior circulation by Anterior Communicating Artery and through the posterior circulation by posterior Communicating Artery.

He performed also angio-MRI that showed the " absence of left ICA flow signal in its intracranial tract ". Cerebral Angio-CT confirmed the complete absence of the cervical and intracranial left ICA with left common carotid artery continuing as external carotid artery and the absence of bony carotid canal on the left side, while right carotid canal was normally developed. Perfusion MRI showed asymmetric of the cerebral hemispheres with a right fronto-parietal area of high Mean Transit Time.

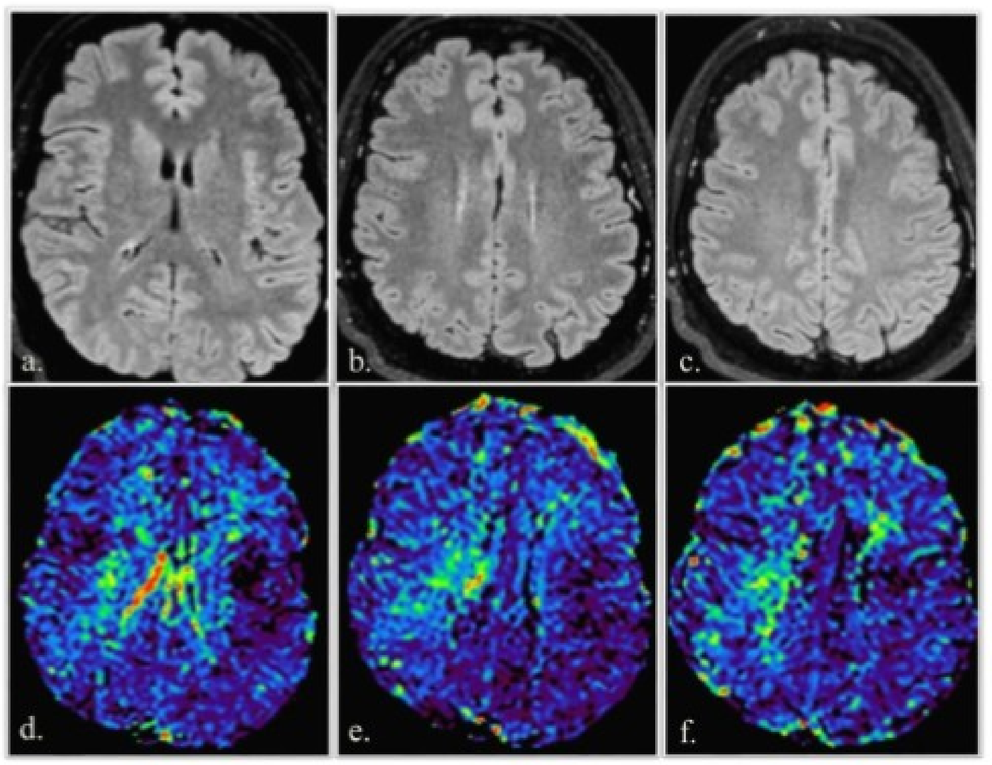

Fig.1: Axial Fluid-Attenuated Inversion Recovery (FLAIR) Magnetic Resonance Imaging [a-c]; Perfusion Dynamic Susceptibility Contrast (DSC) MRI with Mean Transit Time (MTT) map [d-f]
[a-c] FLAIR images show no focal brain signal intensity alteration. Note the mild asymmetry of the lateral ventricles
[d-f] Asymmetric perfusion of the cerebral hemispheres with a right fronto-parietal area of high MTT (green color)

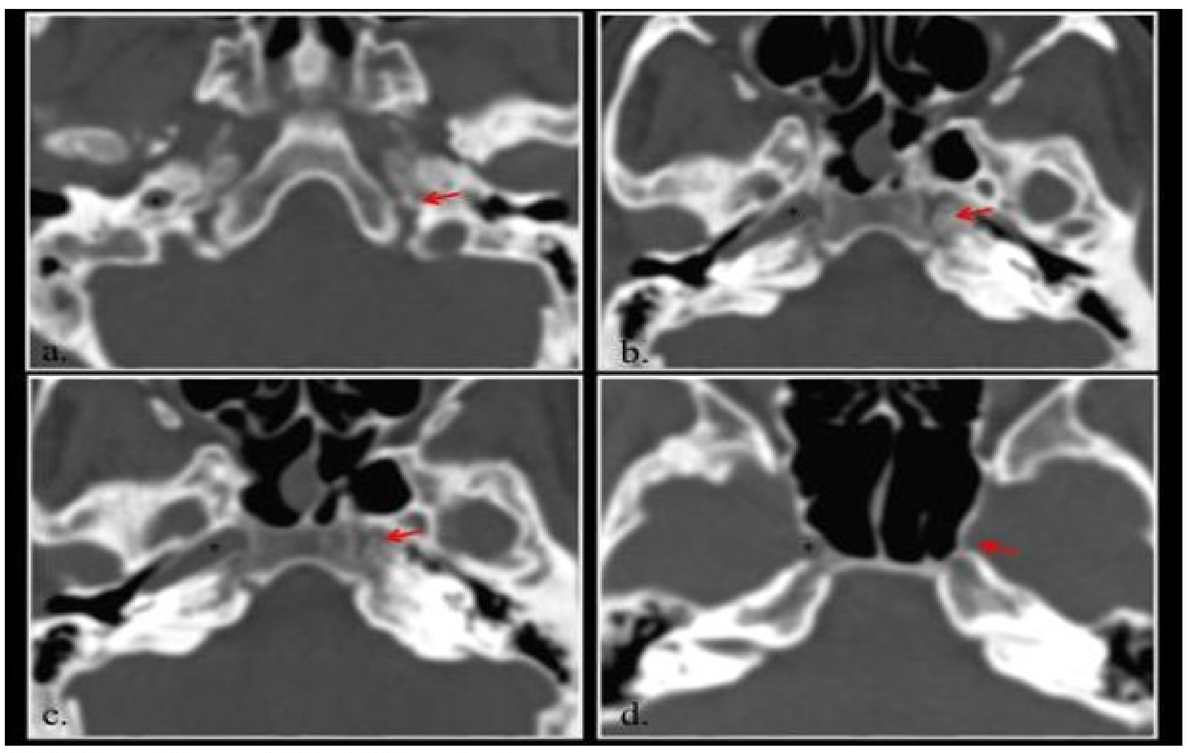

Fig.3 Axial Computed Tomography (CT scan) with bone algorithm.
Four consecutive sections at the skull base showed absent bony carotid canal on the left side (red arrows) and a normally developed right carotid canal (asterisks).

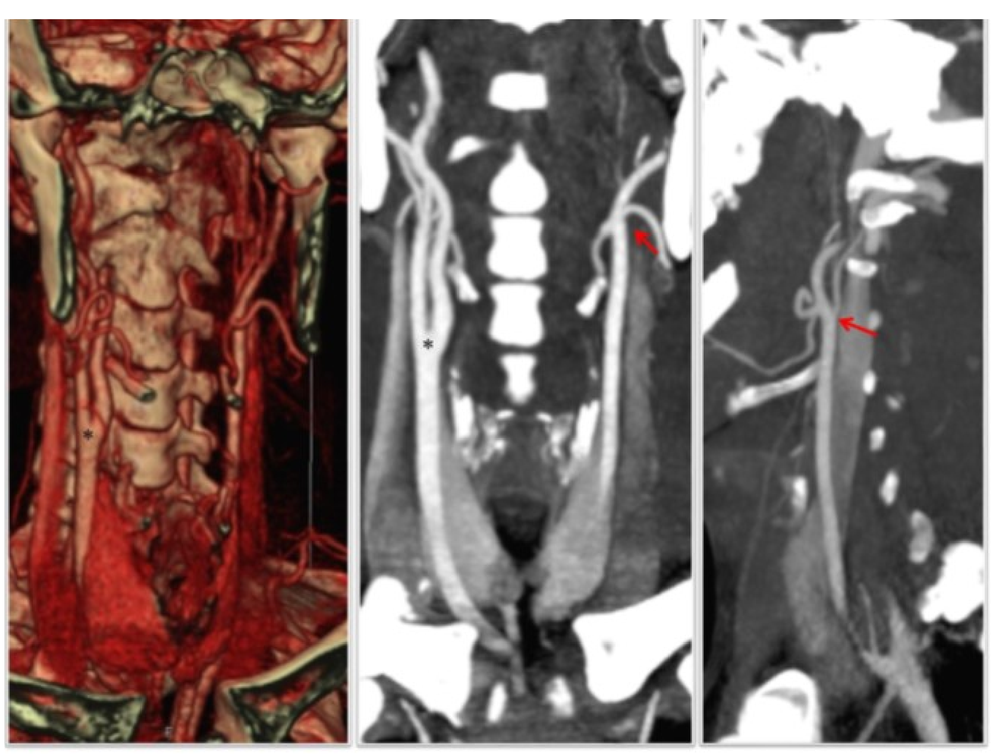

Fig.2: CT Angiography with Volume Rendering Technique (VRT) [a] and Maximum Intensity Projection (MIP) [b,c] well depicted the normal carotid artery bifurcation on the right side (asterisks) and the complete absence of the cervical and intracranial left ICA with left common carotid artery continuing as external carotid artery (red arrows)

CONCLUSION

Compensatory flow allows to patients with agenesis carotid artery to remain asymptomatic, but complications may occur. In our patient the diagnosis of anomaly was made by the use of advanced non-invasive diagnostic techniques (carotid Doppler ultrasound, Angio-CT, MRI, MRI-perfusion) and gave us the opportunity to identify the probable causative disturbance for the symptomatic epilepsy.

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