Aberrant Internal Carotid Artery

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Clinical History

A 64-year-old female with a past medical history of hypertension presented to the emergency department with sudden onset dizziness, described as the room spinning, and several episodes of non-bloody vomiting. The patient had a similar episode 3 years prior for which she was evaluated by a neurologist and started on meclizine. On physical exam, the patient had no nystagmus, no focal deficits, and ambulated normally. No otoscopic exam was performed. CT head and CTA neck were unremarkable.

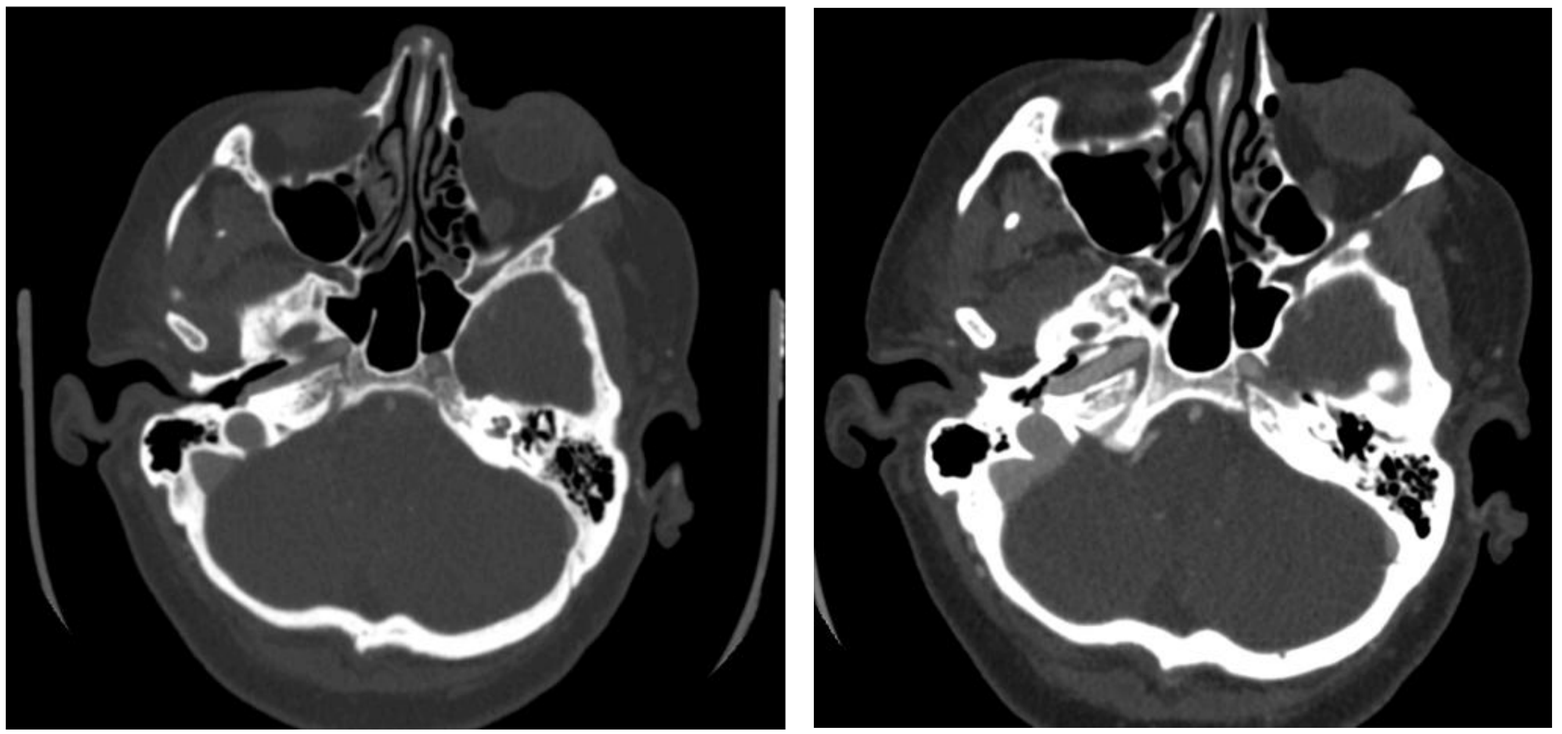
Imaging Findings

CTA head demonstrated no large vessel or proximal branch occlusion or hemodynamically significant stenosis. However, aberrant right internal carotid artery (ICA) with deficiency of the carotid plate and ICA traversing an enlarged inferior tympanic canaliculus was incidentally demonstrated.

Discussion

It is thought that approximately 1% of the population has an aberrant ICA, which forms as a response to involution of the cervical segment of the ICA during embryonic development. Consequently, the inferior tympanic artery (branch of external carotid artery) and caroticotympanic artery (branch of the petrous portion of the ICA) enlarge to rejoin the horizontal segment of the petrous portion of the ICA. Clinically, most patients are asymptomatic, however few patients may experience hearing loss, vertigo, or pulsatile tinnitus. On diagnostic imaging, there is an enlarged tympanic canaliculus with visualization of the artery passing through the middle ear across the cochlear promontory. There may also be an association with the presence of a persistent stapedial artery, which normally regresses in the third fetal month. On an otoscopic exam, an aberrant ICA may appear as a retrotympanic vascular mass with or without pulsation. It is crucial that this is not mistaken for a paraganglioma and biopsied. Aberrant ICA may also be mistaken for a petrous ICA aneurysm. Treatment is rarely indicated, but for those with severe symptoms, synthetic material may be placed between the artery and ossicles.

Images



Images 1 and 2: Axial CTA head demonstrating right aberrant ICA traversing an enlarged inferior tympanic canaliculus with deficiency of the carotid plate.

Teaching Points

- Recognize aberrant ICA as an anatomic variant.
- Understand the importance of documenting the aberrant ICA in a radiology report, especially in patients who may receive otologic assessment or intervention.

References

Glastonbury C, Harnsberger H, Hudgins P, Salzman K. Lateralized Petrous Internal Carotid Artery: Imaging Features and Distinction from the Aberrant Internal Carotid Artery. Neuroradiology. 2012;54(9):1007-13.

Lo W, Solti-Bohman L, McElveen J. Aberrant Carotid Artery: Radiologic Diagnosis with Emphasis on High-Resolution Computed Tomography. Radiographics. 1985;5(6):985-93.

Roll J, Urban M, Larson T, Gailloud P, Jacob P, Harnsberger H. Bilateral Aberrant Internal Carotid Arteries with Bilateral Persistent Stapedial Arteries and Bilateral Duplicated Internal Carotid Arteries. AJNR Am J Neuroradiol. 2003;24(4):762-5.

Sauvaget E, Paris J, Kici S, et al. Aberrant internal carotid artery in the temporal bone: imaging findings and management. Arch Otolaryngol Head Neck Surg 2006;132:86–91, 10.1001/archotol.132.1.86.