

A Rare Case of Bilateral Carotid Cochlear Dehiscence



CARILION CLINIC

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Background

Carotid cochlear dehiscence (CCD) is a rare phenomenon described in the literature as a thinned or absent bony plate separating the internal carotid artery from the cochlea.

- Dehiscence often occurs at the basal turn of the cochlea
 - Temporal bone microdissections have demonstrated that the mean distance between the basal turn of the cochlea and the carotid canal is 1.38mm¹
- When the cochlear endosteum and the internal carotid artery wall abut, variable symptomatology can occur²
 - Unilateral or bilateral tinnitus
 - Conductive hearing loss
 - Vertigo (secondary to the third window phenomenon)

Patient Presentation

A 64 year-old female with over a decades history of subjective intermittent pulsatile tinnitus in the right ear presented to the Otolaryngology - Neurotology clinic due to:

- > 6 months constant pulsatile tinnitus in the right ear & intermittent tinnitus in the left ear
- Tinnitus described as a constant pulsating and occasional “crackly” and “swishing” sounds in her right ear, worse with episodes of tachycardia

She denied a history of surgery or trauma to the ear, recurrent infections, hearing loss, or vertigo

Past Medical History: obesity, hypertension, hyperlipidemia, obstructive sleep apnea, and breast cancer treated with ten years of adjuvant letrozole

Objective Findings

Microscopic otologic examination revealed bilateral:

- Patent external auditory canals
- Intact tympanic membranes
- Normal ossicular landmarks
- Aerated middle ear

Auscultation of the auricle and periauricular region revealed the sound of pulsatile blood flow in synchrony to the patients pulse

- Bilateral, although louder over the right auricle and periauricular region

Pure tone audiometry revealed normal hearing and 100% word recognition bilaterally

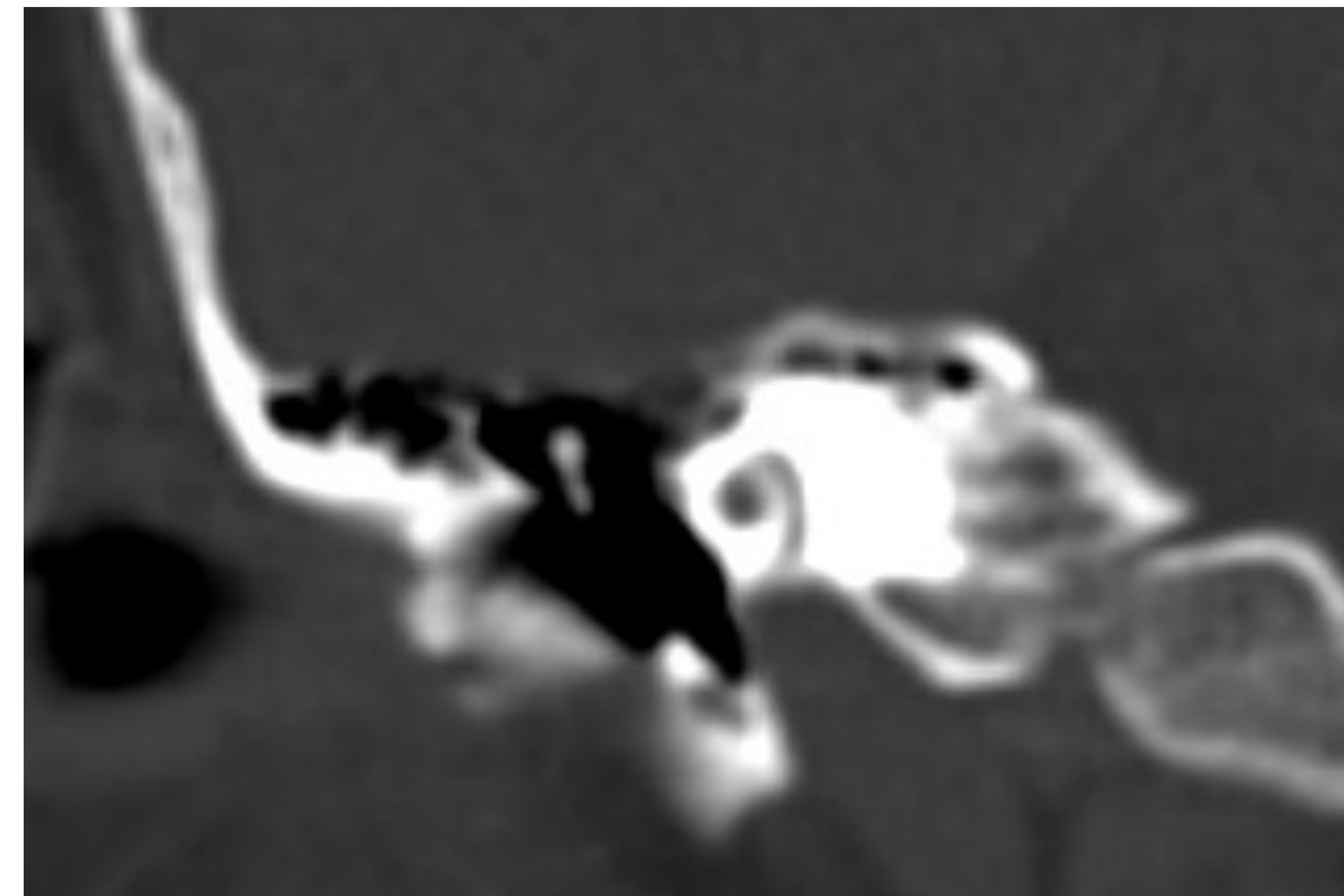


Figure 1a. CT Angiography (CTA) Coronal Right Cochlea
 Carotid cochlear dehiscence located at the basal turn of the cochlea

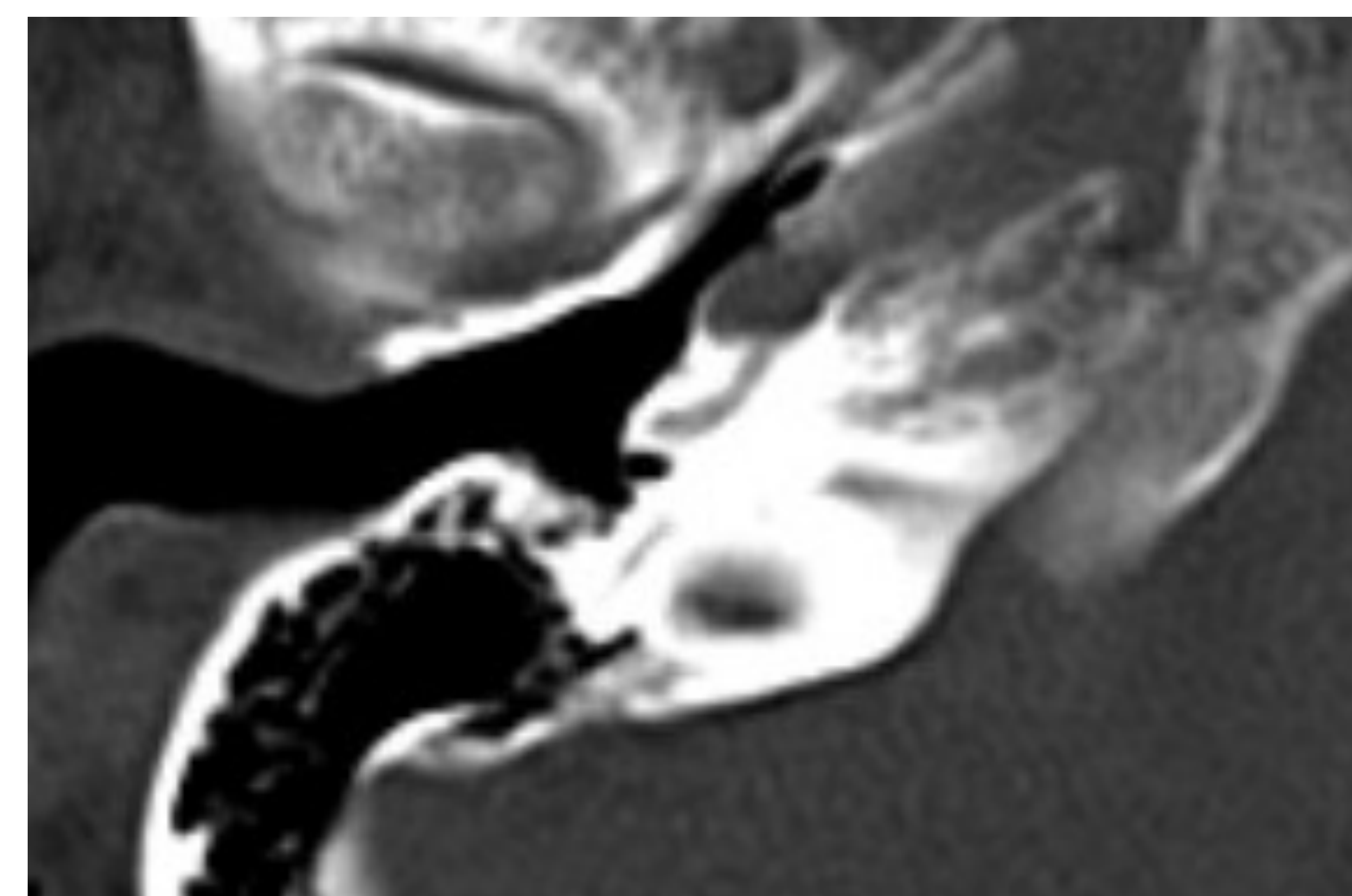


Figure 1b. CTA Axial Right Cochlea
 Lateralization of the right carotid artery contributing to carotid cochlear dehiscence

Objective Findings cont.

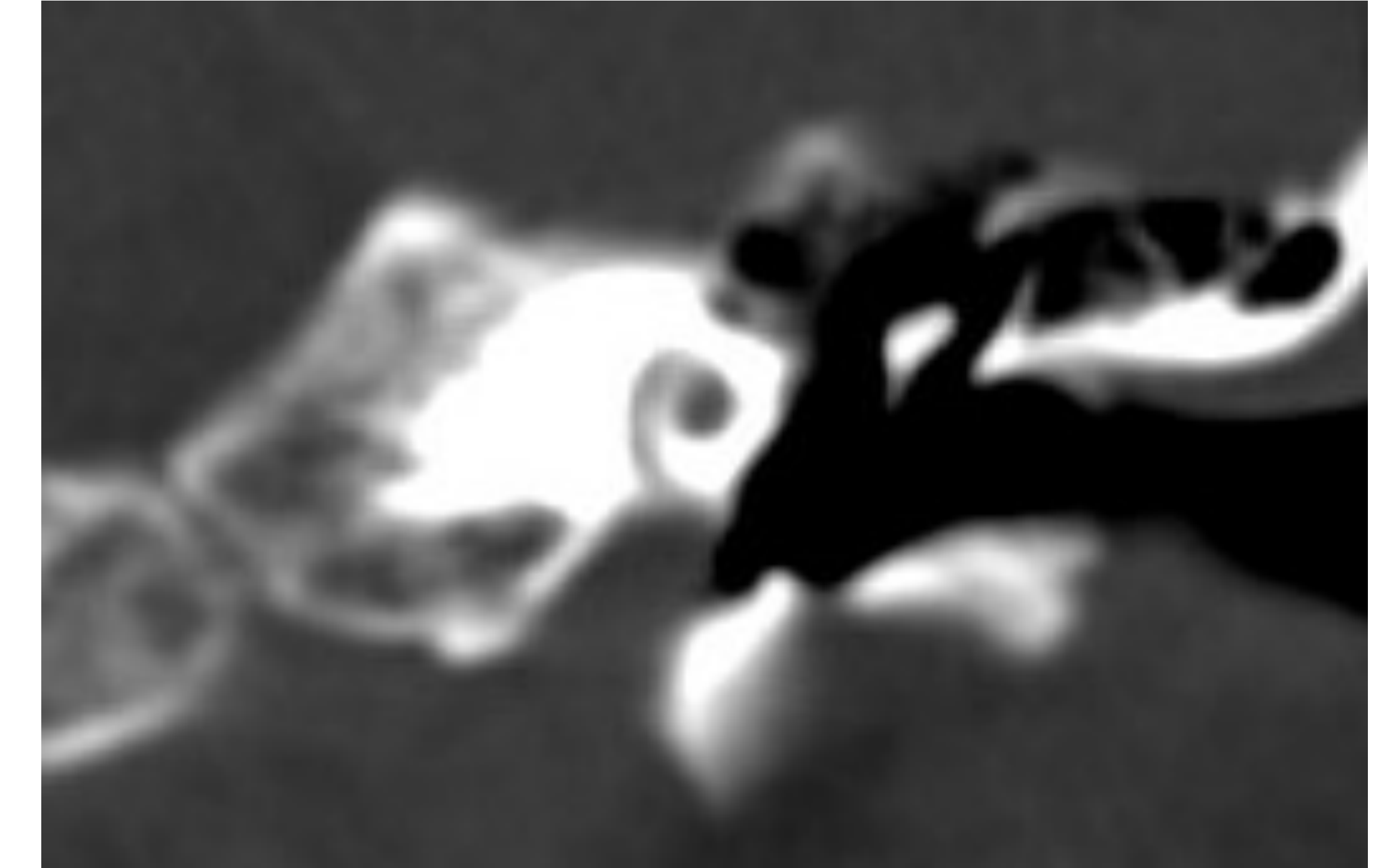


Figure 2a. CTA Coronal Left Cochlea
 Carotid cochlear dehiscence located at the basal turn of the cochlea

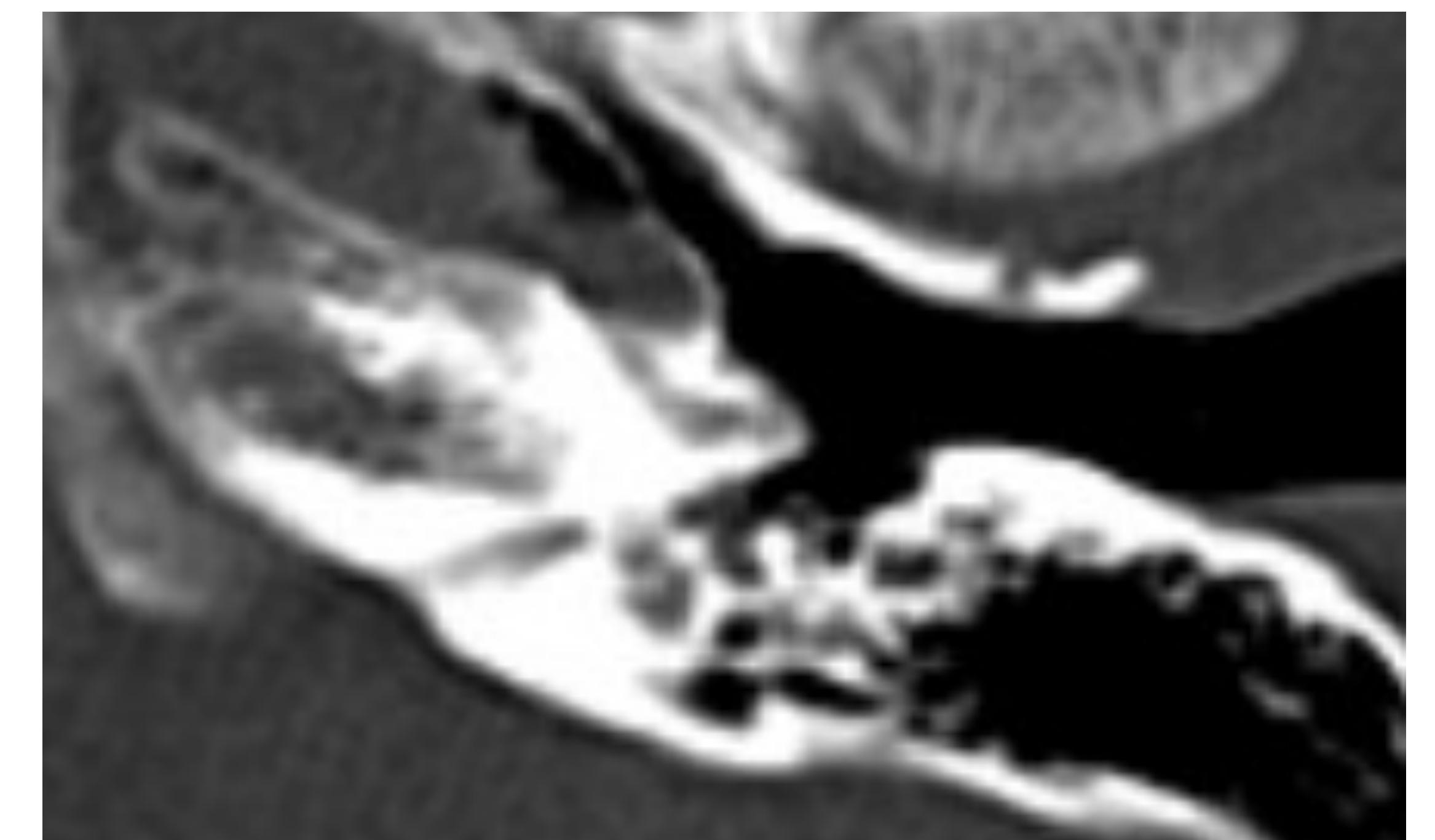


Figure 2b. CTA Coronal Left Cochlea
 Lateralization of the left carotid artery

Conclusion

Carotid cochlear dehiscence is a rare anatomic anomaly that arises from dehiscence of carotid cochlear bony plate in the petrous segment of the temporal bone. In this case, abnormal lateralization of the internal carotid artery further reduced the width of the carotid cochlear bony separation at the basal turn of the cochlea, resulting in potential for carotid cochlear dehiscence bilaterally.

Given the significant risk of inadvertent impact to the internal carotid artery during surgical intervention, the majority of patients with CCD are treated with observation

- In cases of debilitating vertigo, surgical and chemical labyrinthectomy may be performed³

References & Acknowledgements

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