Neuroimaging Localization in Vocal Cord Paralysis: Central and Peripheral Causes

Presented by

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Case 1:

Figure 1: Woman in her 50s presented with hoarseness and found to have vocal cord
paralysis on laryngoscopy. CT neck with IV contrast was performed.

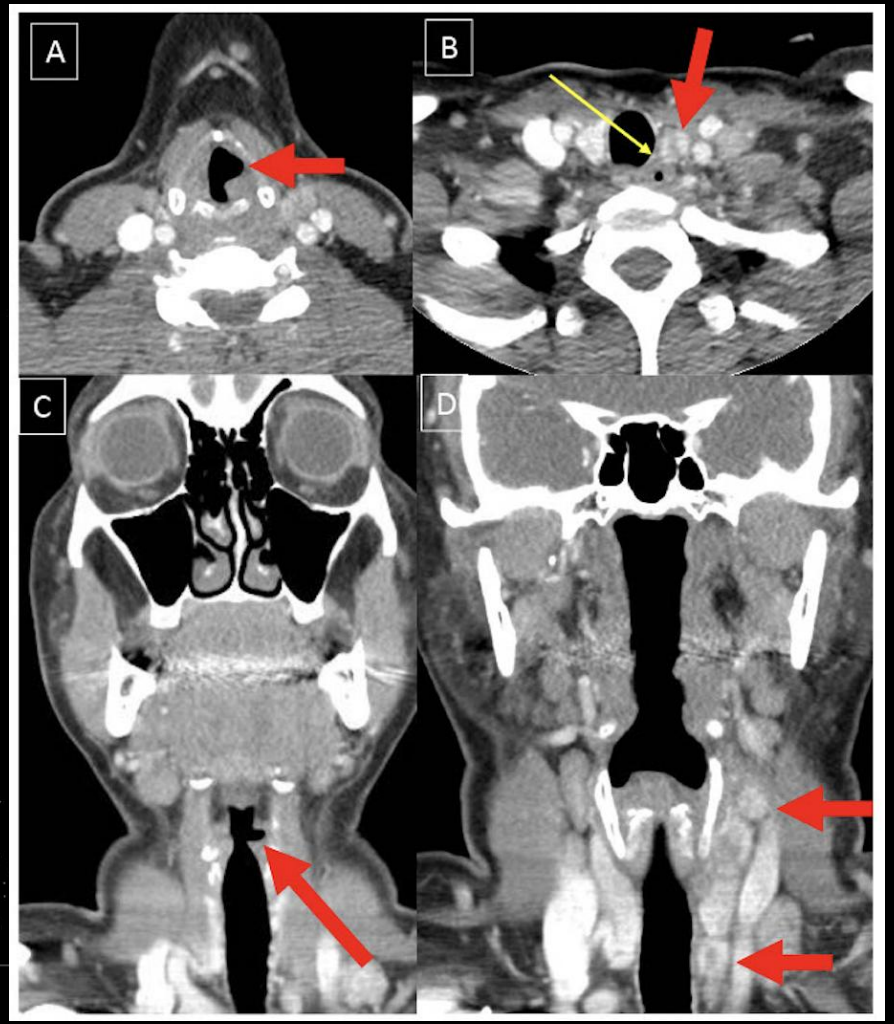

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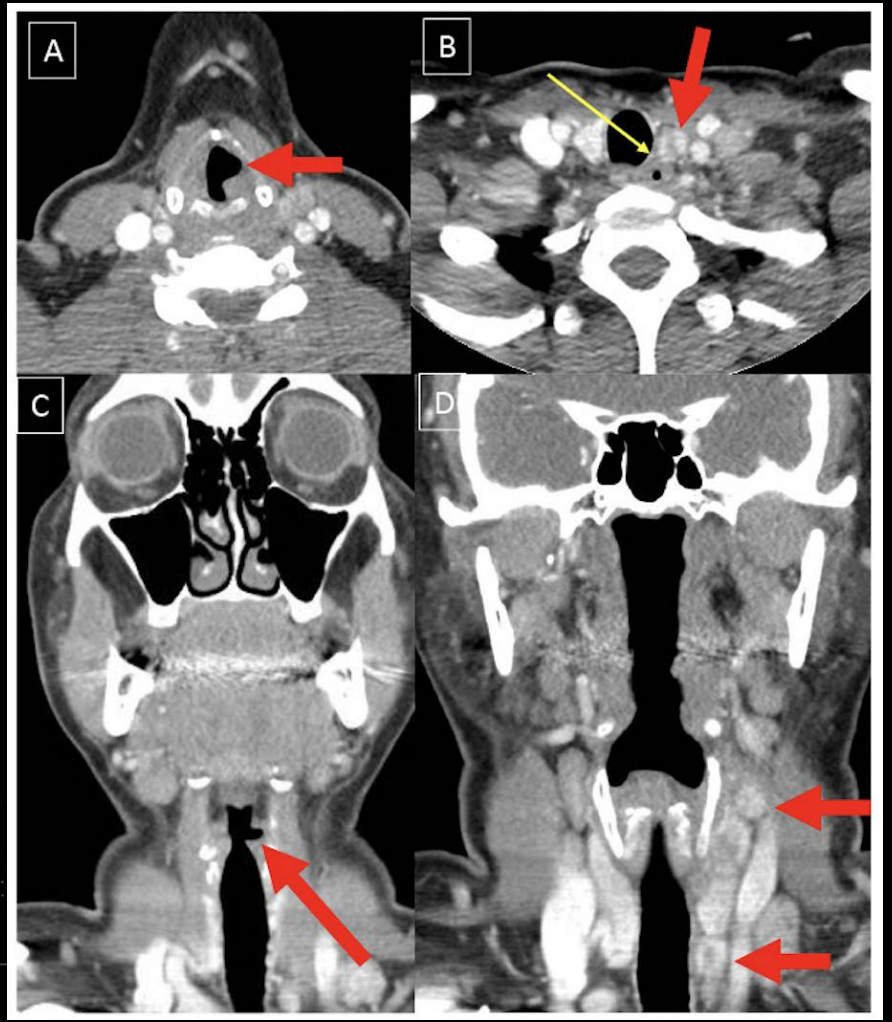
Figure 1: Woman in her 50s presented with hoarseness and found to have vocal cord
paralysis on laryngoscopy.

CT neck with IV contrast was performed.
A, C - Axial and
coronal images at the level of vocal cords demonstrates dilation of left laryngeal ventricle.

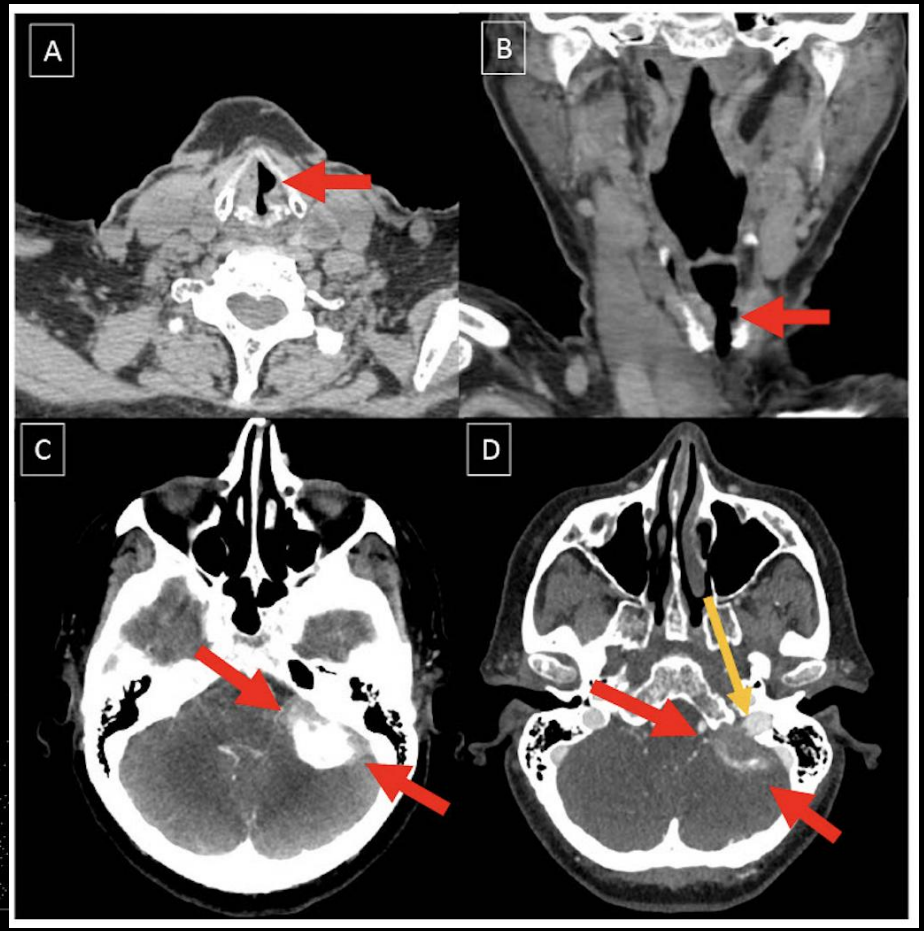
B- Axial image at level of thyroid reveals heterogenous lesion in the left thyroid upper
pole (red arrow), extending towards the tracheoesophageal groove (yellow arrow).

D-Coronal images demonstrates left cervical lymphadenopathy. Pathology revealed papillary carcinoma.



Case 2:

Figure 2: Woman in her 80s presented with hoarseness and dysphagia. Postcontrast CT neck was performed.

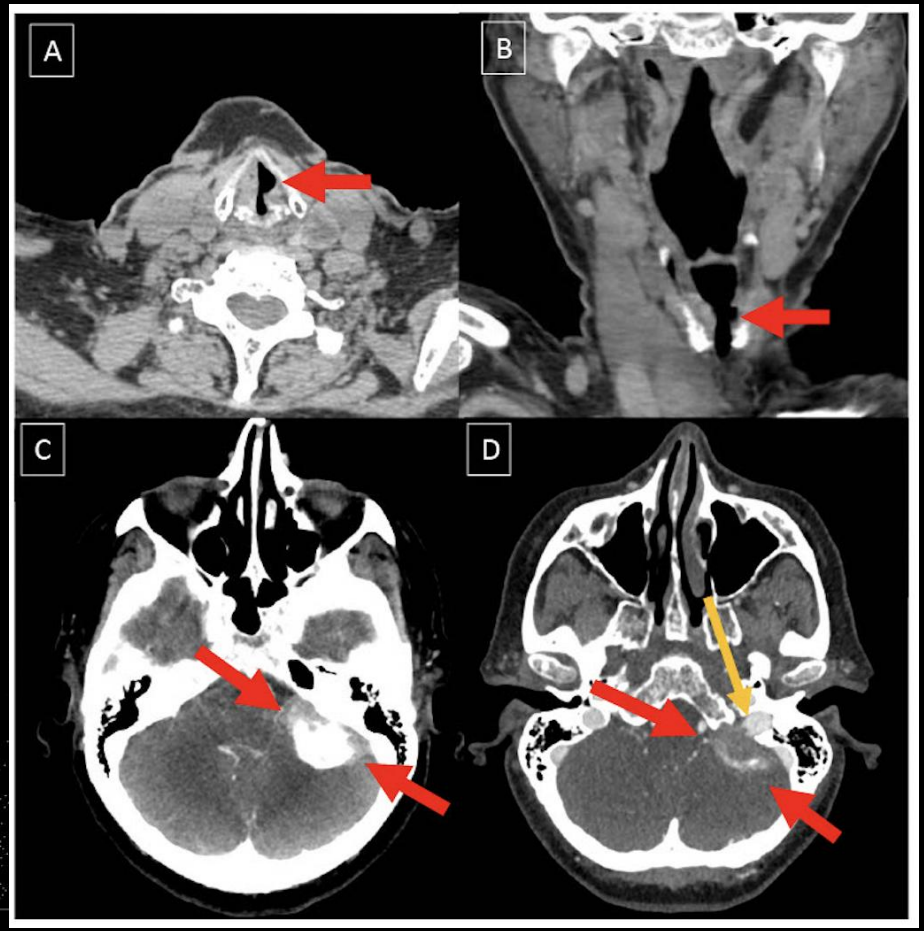


Case 2:

Figure 2: Woman in her 80s presented with hoarseness and dysphagia. Postcontrast CT neck was performed.

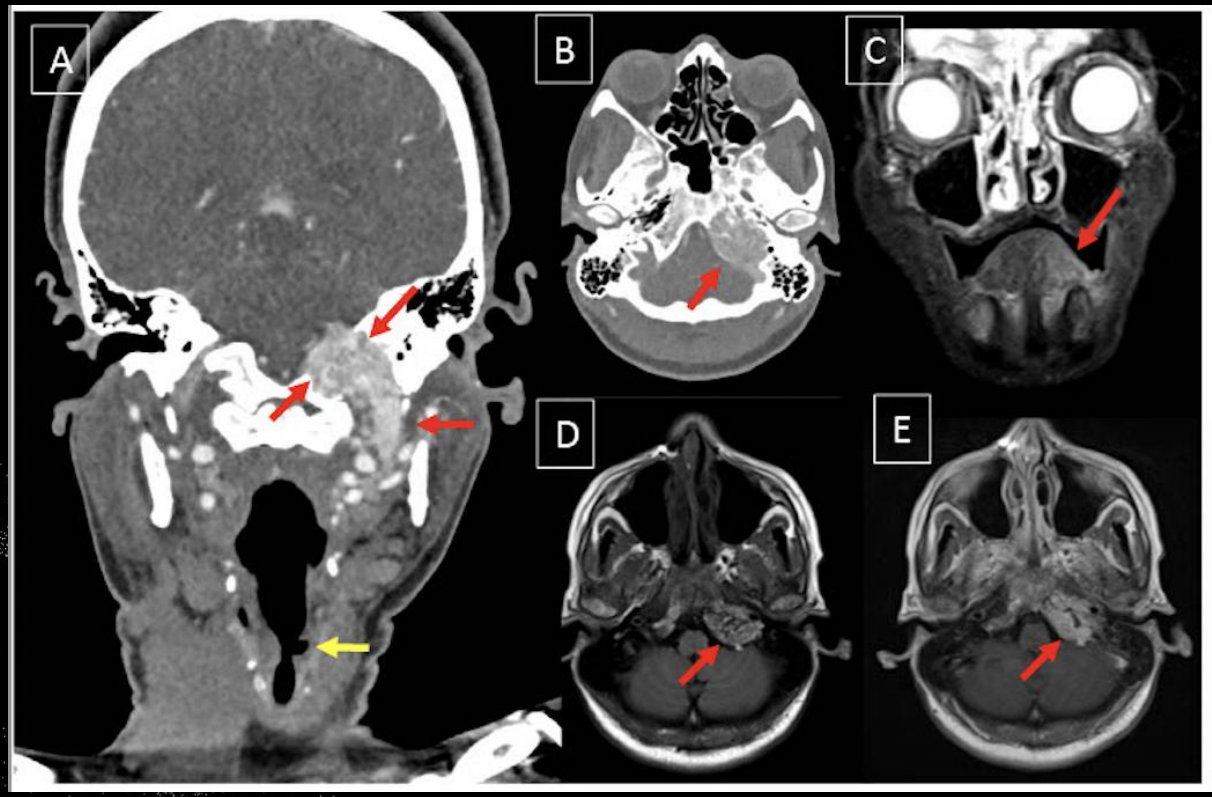
A - Axial and coronal images at level of vocal cords demonstrates left laryngeal ventricle dilatation.

C, D - Axial images through the posterior fossa reveals a partially calcified extra-axial mass along the left petrous bone (red arrows) extending towards the jugular fossa, likely with mass effect upon CN IX, X, and XI (orange arrow).



Case 3:

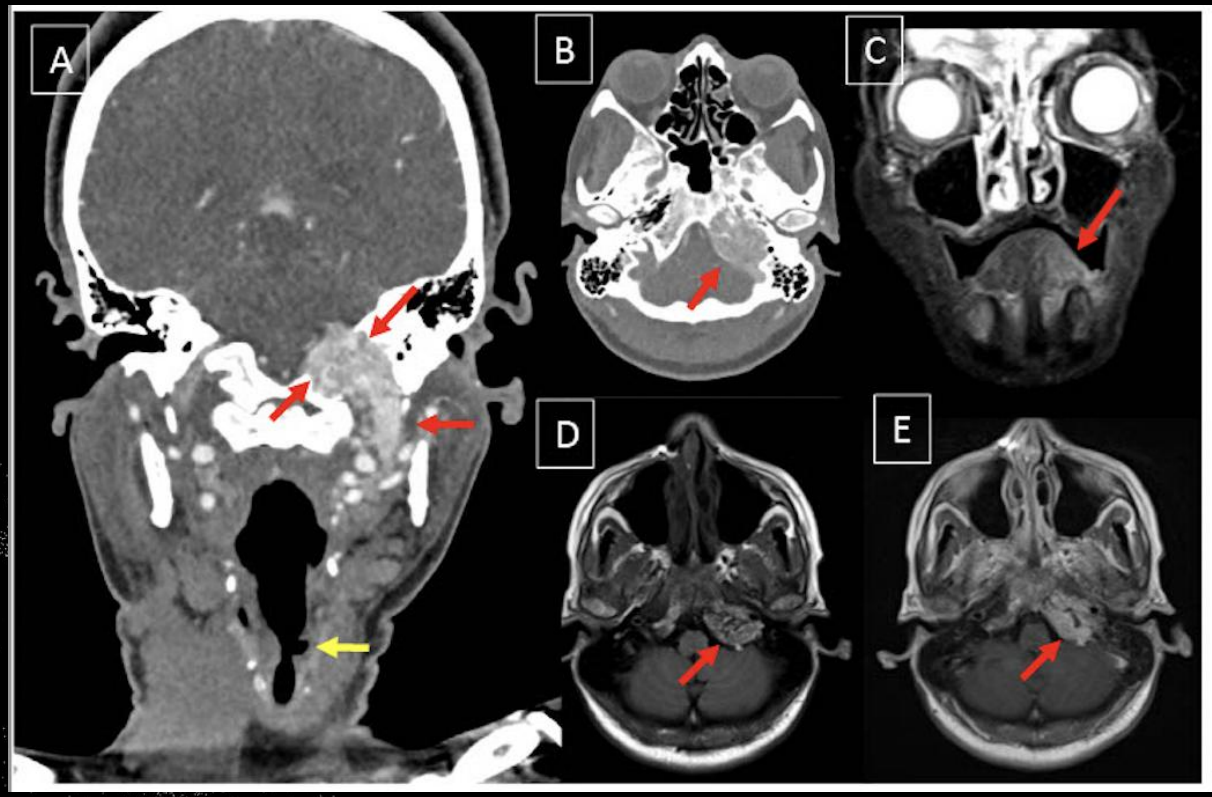
Figure 3: Woman in her 50s presented with headache and hoarseness. CTA head and neck was performed.



Case 3:

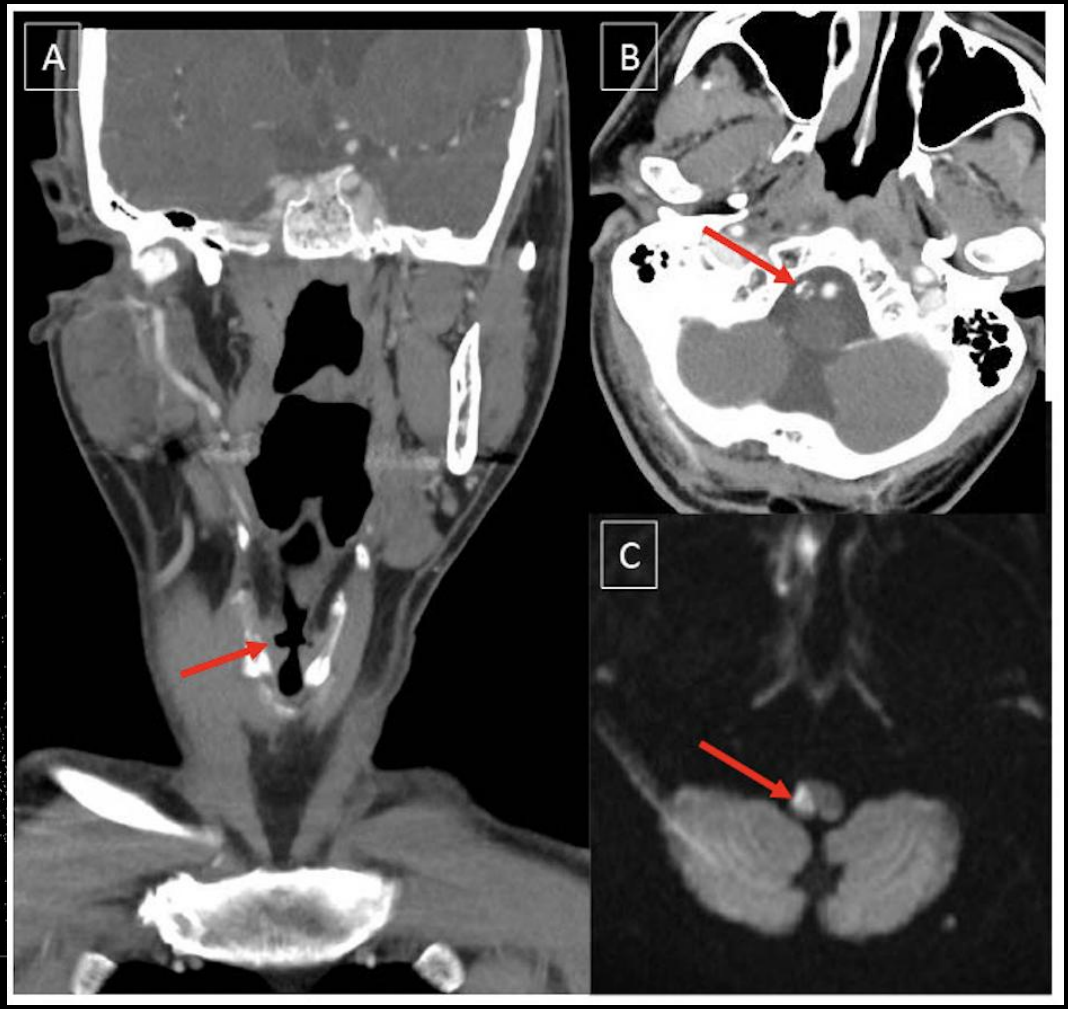
Figure 3: Woman in her 50s presented with headache and hoarseness. CTA head and neck was performed.

A - Coronal CA image demonstrates left laryngeal ventricle dilatation suggestive of vocal cord paralysis (yellow arrow), and a destructive lesion involving the left jugular fossa.
B - Axial CA image through the posterior fossa again shows destructive lesion at the left jugular fossa. MRI
neck with contrast was subsequently performed.
C - Coronal STIR image reveals left hemi-tongue
edema.
D, E - Pre and Post contrast axial T1 images show internal foci of intrinsic T1 hyperintensity within the left jugular fossa lesion, as well as post contrast enhancement.



Case 4:

Figure 4: Man in his 50s presented with acute onset hoarseness, dysphagia and facial palsy.



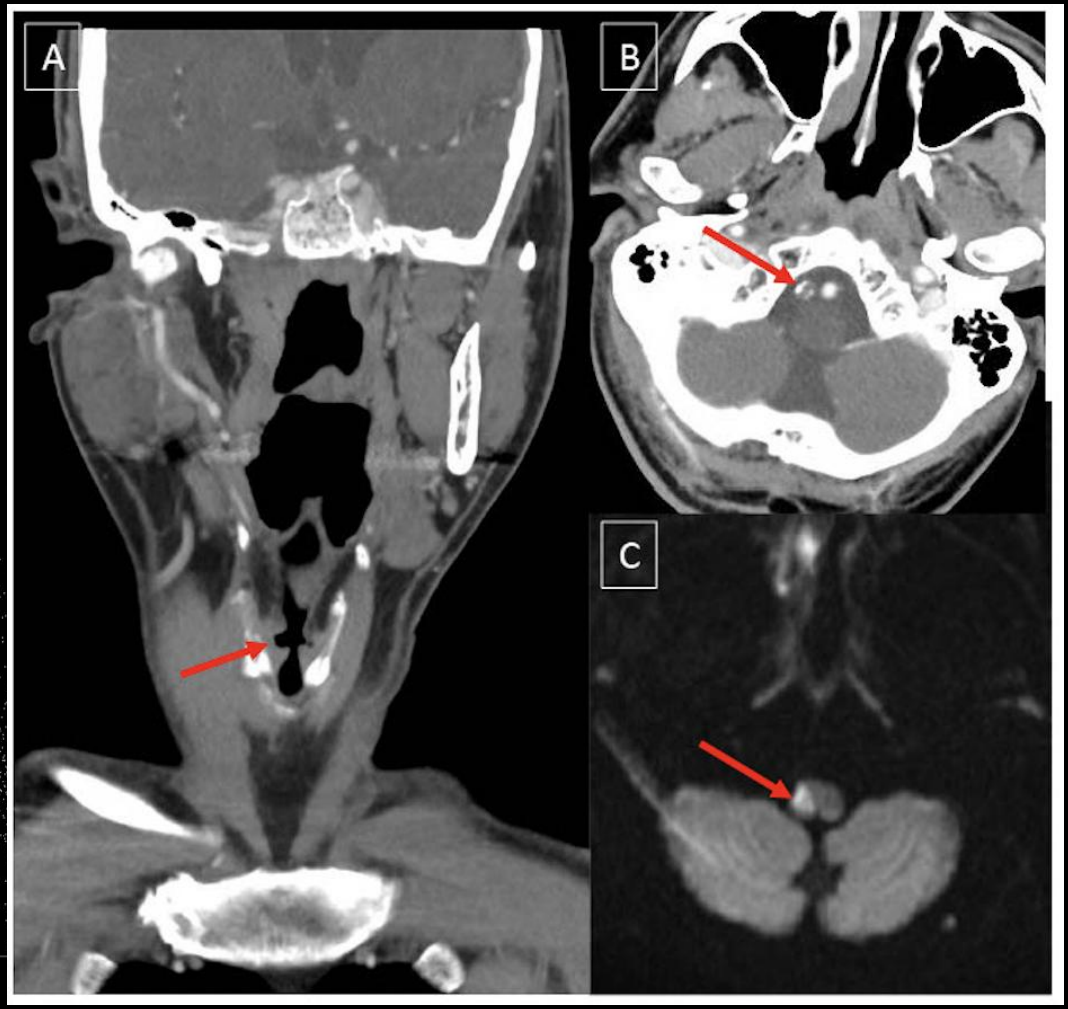
Case 4:

Figure 4: Man in his 50s presented with acute onset hoarseness, dysphagia and facial palsy.

A- Coronal CTA image reveals right laryngeal ventricle dilatation.

B - Axial CTA
image shows occlusion of the right intracranial vertebral artery.

C - Axial WI MR at the
level of the brainstem reveals an acute right medullary infarct.



Case 5:

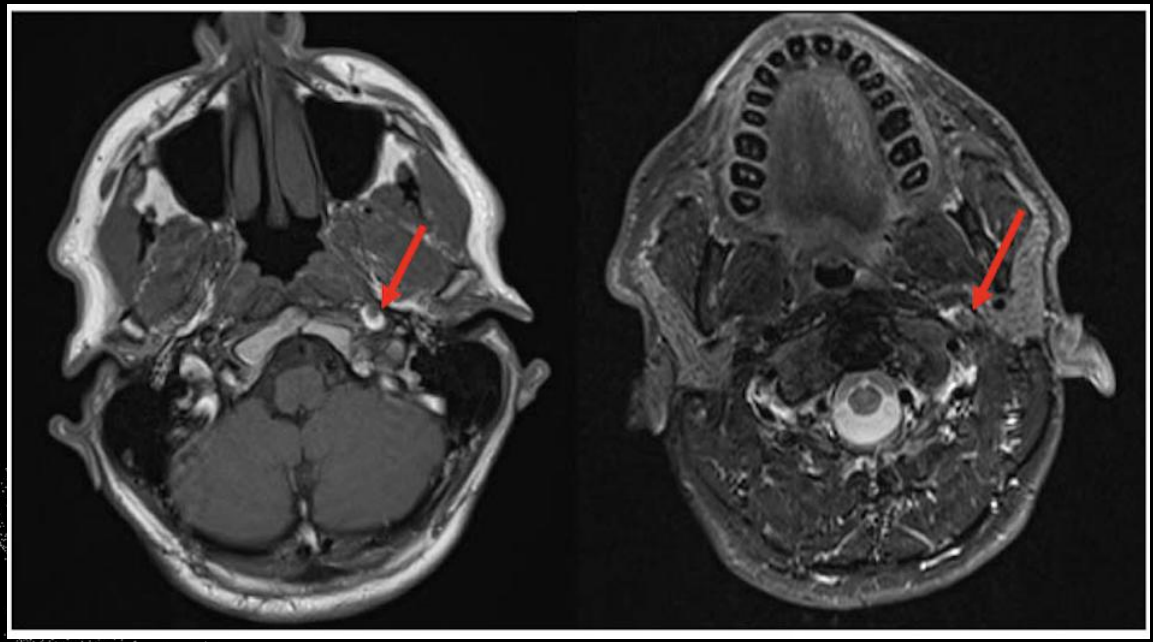


Figure 5: Man in his 50s presented with subacute dysphonia and dysphagia. MRI of the neck was performed.

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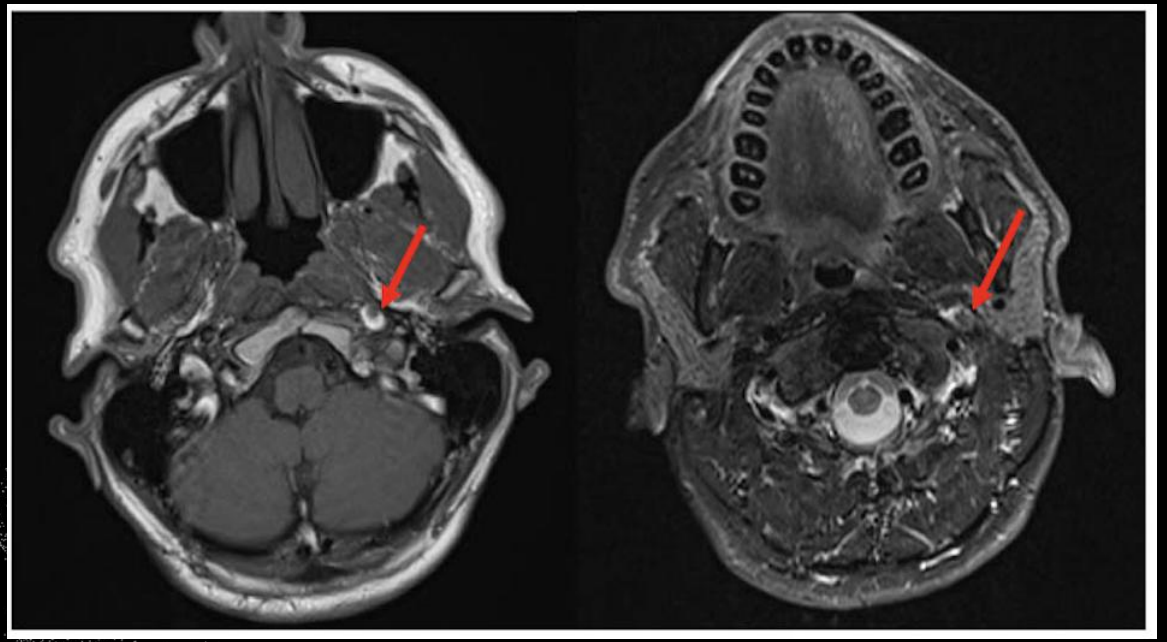

Figure 5: Man in his 50s presented with subacute dysphonia and dysphagia. MRI of the neck was performed.

A - Axial non-contrast T1 image at the level of the skull base demonstrates enlargement of the left cervical ICA with internal T1-hyperintense semi-lunar signal compatible with a dissection with thrombosed false lumen.

B - Axial STIR image show loss of normal flow void in the left cervical ICA. Compression of left CNIX/X/XI by dissecting aneurysm was suspected resulting in patient's symptoms.

Takeaways:

- Hoarseness is an early sign of vocal cord paralysis that may be an indication of a more critical pathology.
- The vagus nerve originates from 3 nuclei (solitary, ambiguous, and dorsal motor) in the medulla oblongata, before traveling through the jugular foramen and giving rise to the recurrent laryngeal nerve which supplies the intrinsic muscles of the vocal cords.
- Vocal cord paralysis can be the result of pathologies anywhere along the course of the vagus nerve, starting upstream from the brainstem to downstream in the mediastinum
- Although vocal cord paralysis from downstream lesions may be more recognized, upstream lesions such as cystic astrocytoma, jugular foramen tumors, acoustic neuromas, vagal schwannoma, and viral neuropathies should not be overlooked.
- Upstream lesions often present in combination with neuropathic signs from cranial nerves 9, 11, and 12.