

**Financial Disclosure**

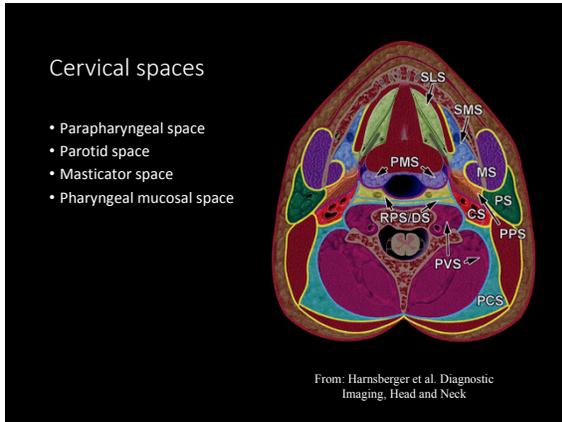
No conflict of interest relevant to this topic

**Acknowledgments**

- Wendy Smoker MD
- Deborah Reede MD
- Samir Noujaim MD

**Learning objectives**

- Review normal carotid space anatomy and related structures
- Review critical differential diagnosis and common pitfalls.



**Structures**

- Internal carotid artery
- CN IX, X, XI, XII
- Sympathetic ganglion
- Internal jugular vein
- Internal jugular lymph node chain

## Differential diagnosis

- Congenital
- Inflammatory
- Vascular Lesions
- Neoplastic

## Congenital

## Second Branchial Cleft Cyst

- Most common branchial anomaly
- Located anterior to the SCM
- Present after Upper respiratory infection.

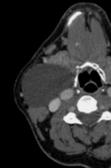


## Bailey Classification

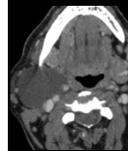


Type I  
Superficial cysts lying anterior and adjacent to the SCM muscle.

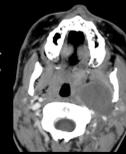
Deep to platysma muscle and the anterior lateral surface of sternocleidomastoid muscle.



Type II is more medial than type I, along the anterior surface of the sternocleidomastoid muscle, lateral to carotid space and posterior to the submandibular glands, arising on a line between the skin of the lateral neck and the ipsilateral faucial tonsil.

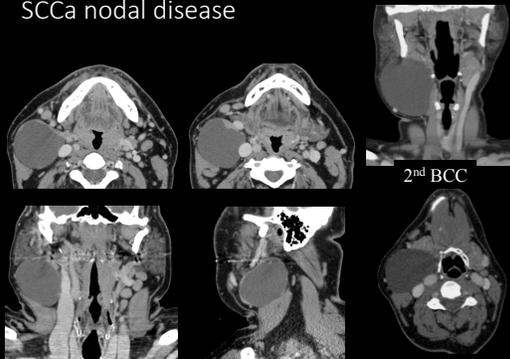


BCCs extend farther medially between the internal carotid artery and external carotid artery at the carotid bifurcation. Visualization of the cyst's extension or "tail" between the internal carotid artery and external carotid artery has been considered pathognomonic for type III BCCs

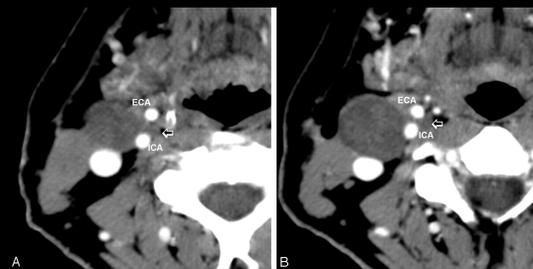


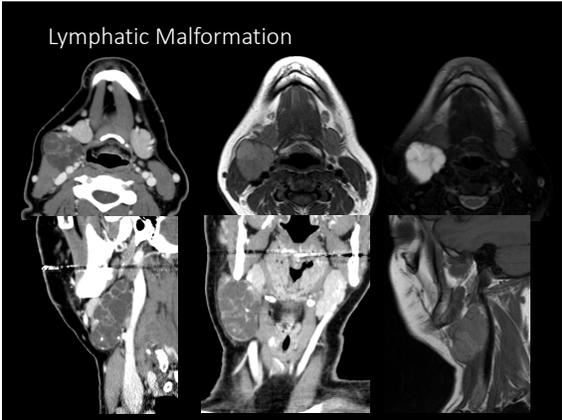
The least common and arises against the pharyngeal mucosal space just deep to the palatine tonsil, often extending upward from tonsil toward the skull base

## SCCa nodal disease

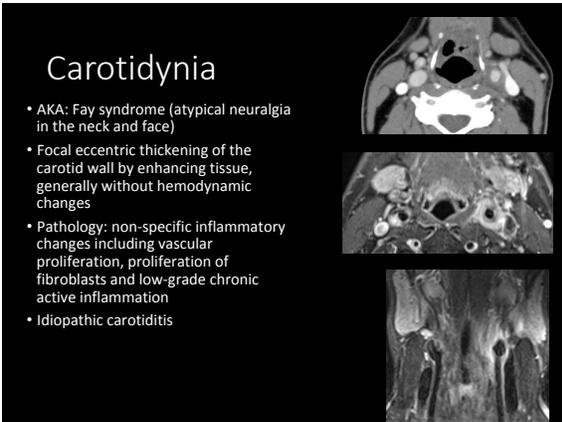
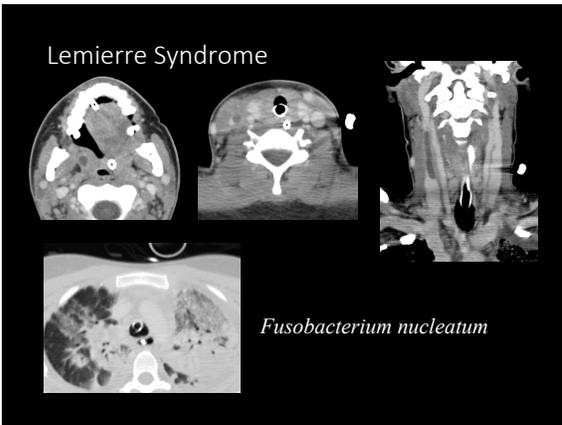
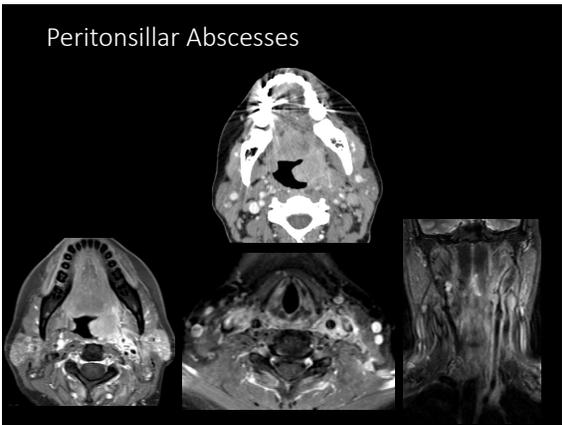


## Cystic schwannoma





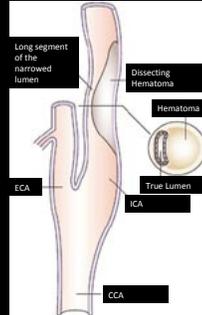
Inflammatory



Vascular lesions

## Cervicocephalic arterial dissection

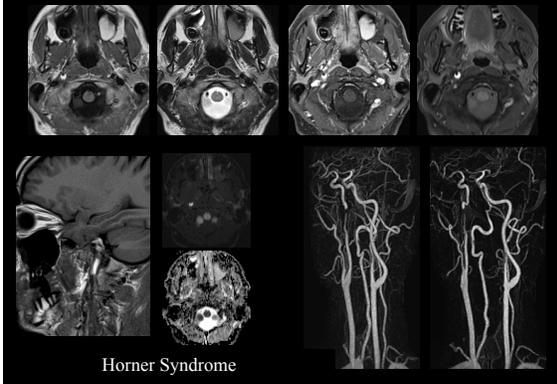
- Term dissection refers to hemorrhage within the wall of the artery, regardless of the etiology;
- Predisposing factors for spontaneous dissection: Hypertension, underlying arteriopathy (Fibromuscular dysplasia), cystic medial necrosis, Marfan syndrome, Type IV Ehlers-Danlos.



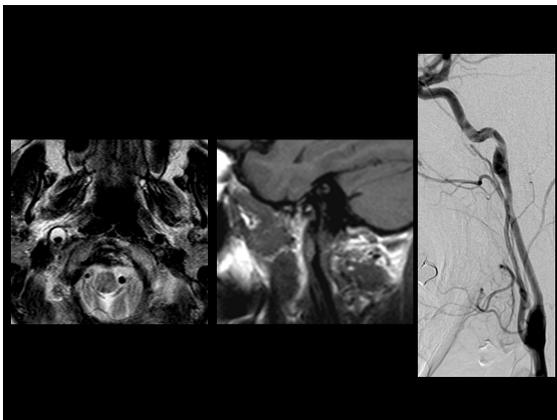
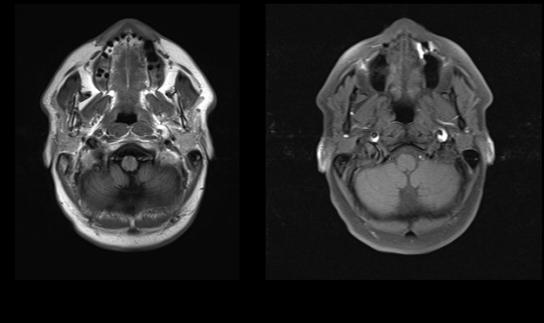
## Dysplastic ICA Aneurysm



## ICA Dissection



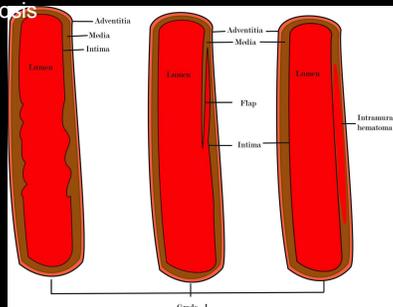
## Bilateral Carotid Dissection



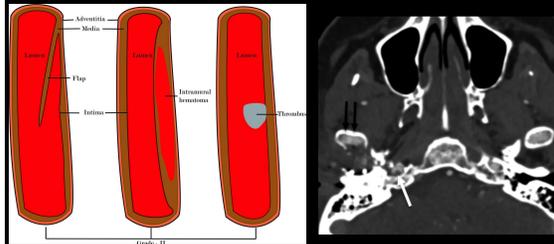
## BCVI

- Blunt injury of the carotid and vertebral arteries (collectively termed blunt cerebrovascular injury [BCVI]) is an injury in patients caused by blunt trauma.
- Stroke is one of the most feared outcomes of BCVI, with a reported overall incidence of 10%–13% in recent literature.
- Modified Denver Criteria being the most accepted

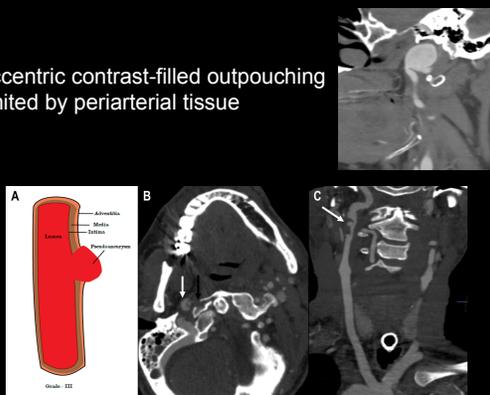
Nonstenotic luminal irregularity  
Intimal flap or wall thickening with 25% stenosis



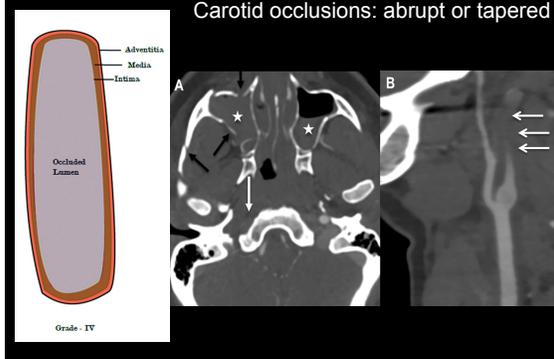
Luminal hypodensity (thrombus)  
Intimal flap or wall thickening with 25% stenosis



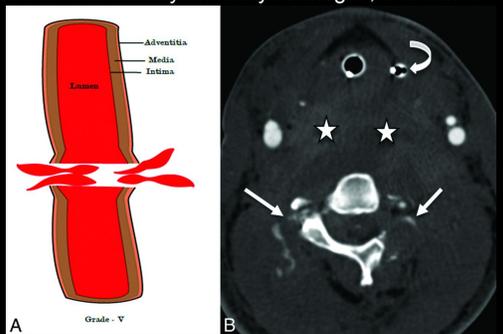
Eccentric contrast-filled outpouching  
limited by periarterial tissue



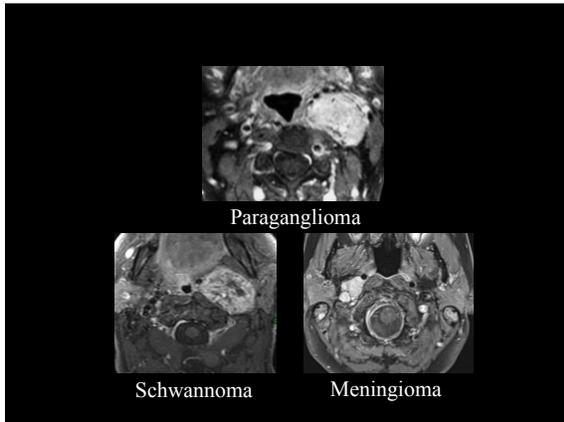
Lack of any intraluminal enhancement  
Carotid occlusions: abrupt or tapered



Irregular extravascular collection of contrast, not  
limited by periarterial tissue  
Increases in density on delayed images, if obtained



Neoplasms

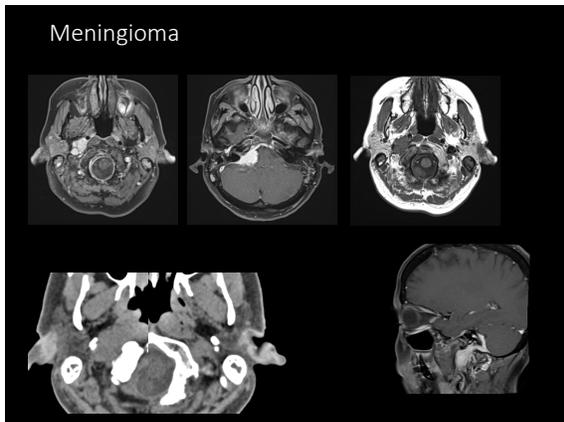
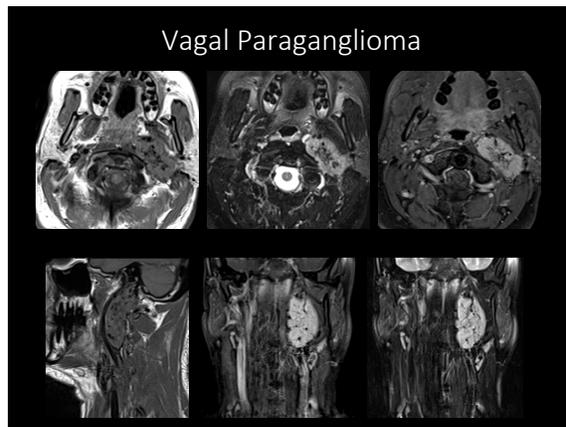


### Paragangliomas

- Tympanic (Middle ear)
- Jugular
- Vagal
- Carotid Body

### Vagal Paragangliomas

- Located below skull base,
- Usually lie entirely within carotid space
- As vagus nerve lies dorsal to ICA, these tumors usually displace ICA anteriorly
- Permeative erosive changes with amputation of the jugular spine demonstrated on CT



### Schwannomas

- Arises from Schwann cells wrapping around CNs IX-XII. CN X most common (50%)
- Typically asymptomatic but may have Horner syndrome, VCP, dysphagia, sore throat
- Well-circumscribed; Vagal schwannomas displace ICA and PPS anteriorly
- CT: CS enhancing mass, solid, +/- cystic component
- MRI: T1: iso to hyperintense; T2: hyperintense; enhance. No flow voids

