

## Carotid Disease

### History:

- Symptomatic: stroke – slurred speech, facial droop, weakness in one sided extremity
- TIA – stroke like symptoms lasting <24 hours, amaurosis fugax
- Asymptomatic: carotid bruit, incidentally noted on other imaging or workup
- PMH or family history of heart disease or stroke, HLD, HTN, history of smoking

### Physical Exam:

- Full neurologic exam
- Full vascular exam, including listening for carotid bruits

### Anatomy:

- Right carotid artery comes off of innominate artery, left comes off of aortic arch directly
- Bifurcation at carotid bulb (has baroreceptors)
- Internal carotid artery has no extracranial branches. First intracranial branches are ACA/MCA
- External carotid artery has extracranial branches – first branch is superior thyroid
- Connected by Circle of Willis in brain

### Imaging:

- Carotid duplex ultrasound: velocity criteria to determine level of stenosis
- CT scan: can measure level of stenosis – different methods (NASCET and ECST). Non-contrast CT scan is the first step in suspected stroke to rule out hemorrhage
- MRI: can overestimate stenosis due to calcifications in the plaque in moderate stenosis. MRI can also be used to evaluate patients in early stroke
- Angiogram: “gold standard”. Rarely indicated these days
- Echocardiogram/EKG: part of workup for other sources

### Treatment:

- Medical management: for asymptomatic patients.
  - o Aspirin, statin, smoking cessation, antihypertensive medications
- Surgical management: for symptomatic patients or severe stenosis in asymptomatic patients
  - o Carotid endarterectomy: removal of plaque from artery with patch closure
    - Intraoperative neuro monitoring: awake, EEG, cerebral oximetry, shunt
    - Possible complications: bleeding, stroke, cranial nerve injury
  - o Carotid stent: radiation induced stenosis, anatomically high/low bifurcation, redo neck surgery, open wounds on neck (tracheostomy, etc.), contralateral vocal cord injury
  - o May delay for 2-4 weeks in patient who has had a large stroke

### Follow up:

- Post surgically, patients are followed with carotid duplex
  - o 1 month, 6 months, then yearly if stable
- Patients managed with medical management are followed approximately every 6 months for one year then every year if they remain stable

### When should you operate?

- Crescendo TIAs (urgent/emergent): worsening/more often TIAs
- NASCET: symptomatic patients with >50% stenosis (15.7% 5-year stroke/death risk vs. 22% with medical management only)
- ACAS: asymptomatic patients with >60% stenosis (5% 5-year stroke/death risk vs. 11% with medical management only)
- Do not operate on occluded carotid arteries