2023 MID-ATLANTIC CONFERENCE

11th ANNUAL CURRENT CONCEPTS IN

VASCULAR THERAPIES

2023

Hilton Virginia Beach Oceanfront
Virginia Beach, Virginia

APRIL 20-22

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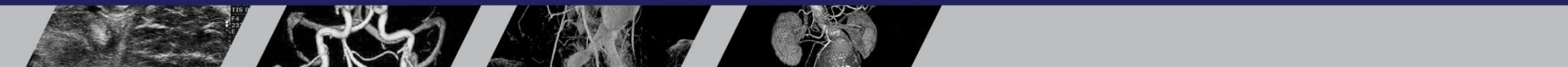
April 21st 2023

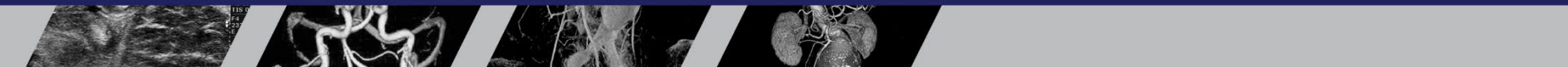
Primary Care Perspective: Who Gets Screened and When to Refer to Vascular Surgery

Disclosures



Outline

- Which patients warrant a carotid ultrasound?
  - History
  - Physical exam
- When is it appropriate to refer a carotid patient to vascular surgery?



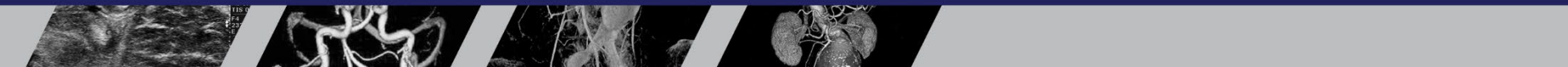
68 yr female presents to your office complaining of sudden onset of tingling and numbness in RUE and RLE 3 weeks ago which resolved after 10 min spontaneously.

Active smoker (1ppd x 30 yrs) and HTN

No anti-platelet agents

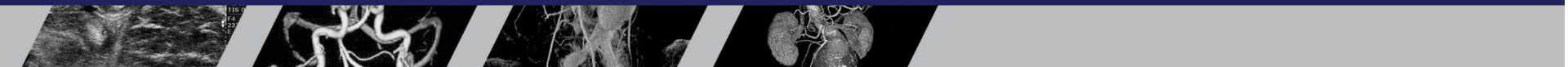
PE: No carotid bruit noted. No Rt sided residual weakness appreciated

YES



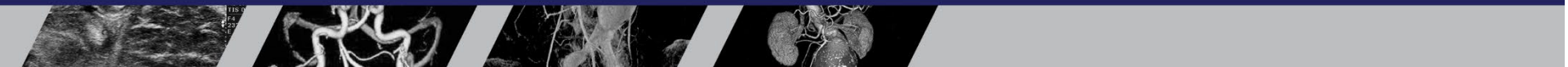
Why?

- This patient had a TIA (Transient Ischemic Attack)
  - Sudden onset of weakness/numbness in arm or leg
    - Loss of balance/coordination, Clumsy hand or leg, Difficulty grasping or holding things (pen, coffee cup)
  - Slurred/Garbled speech
    - Aphasia
  - Amaurosis fugax (Transient Monocular blindness)
    - Pulling a lampshade or curtain down over 1 eye



TIA (Mini-stroke)

- Symptoms of TIA typically last a few minutes but can last up to 24 hours
- TIAs are early warning signs that the patient is at a risk for stroke
  - Analogy
    - Recurrent chest pain prior to MI

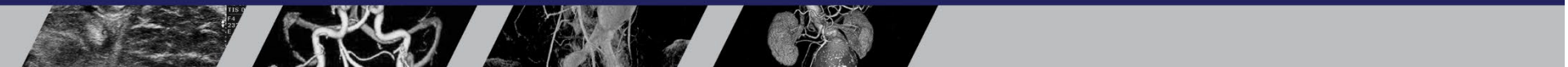


Risk of Stroke after TIA?

- ***Incidence of Transient Ischemic Attack and Association With Long-term Risk of Stroke***

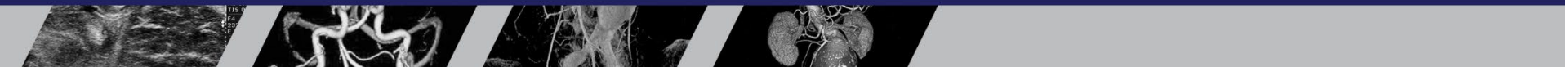
  JAMA. 2021;325(4):373-381

- 2 groups – TIA vs Non-TIA group
  - 435 patients TIA vs 2175 patients Non-TIA (control group)
  - 130/435 with TIA had a stroke – 29.8%
  - 165/2175 without TIA had a stroke – 0.07%



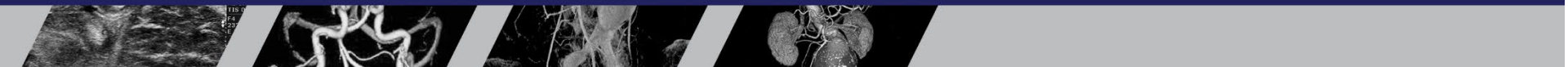
Risk of Stroke after TIA?

- Results
  - Of the 130 patients that had CVA after TIA
  - 21.5% stroke occurred within 7 days from index TIA
  - 30.8% stroke occurred within 30 days from index TIA
  - 39.2% stroke occurred within 90 days from index TIA



Risk of Stroke after TIA?

- Conclusion:
  - The risk of stroke was much higher in the TIA group vs. the control group (Non-TIA group)



79 yr male new patient presents to establish care. He moved from CA to VA and does not have his medical records. He admits to having a CVA 2 year ago. He recalls being admitted and then doing stroke rehab.

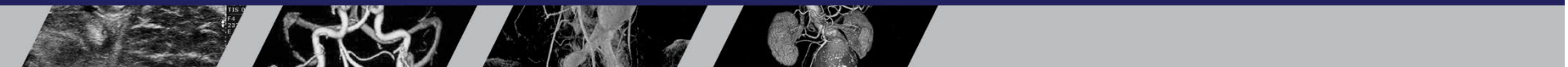
DM, HTN, Hyperlipidemia and Active Smoker

PE: No carotid bruit noted. No residual signs of stroke

YES

Why?

- This patient had a Hx of CVA(Cerebrovascular Accident) and has risk factors for carotid atherosclerosis
  - With a history of CVA, it is appropriate to get a carotid duplex as a baseline study
    - Determine stroke risk
    - Implement preventive measures

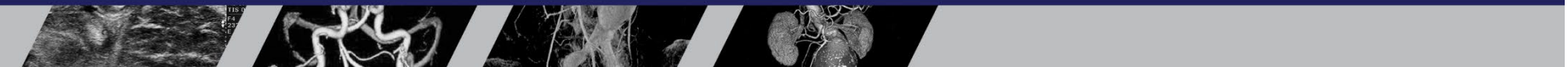


Risk factors for carotid atherosclerosis?

- ***Prevalence and risk factors for atherosclerotic carotid stenosis and plaque***

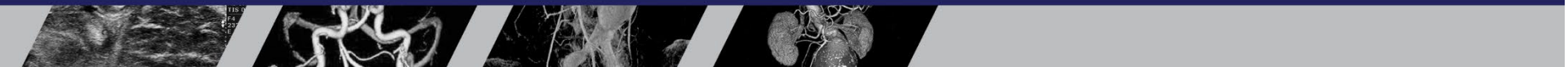
  Medicine 2017 Jan;96(4)

- 3030 patients that all underwent carotid duplex
  - Separated into two categories
    - Carotid plaque – ICA plaque with < 50% stenosis
    - Carotid stenosis – ICA plaque with >50% stenosis



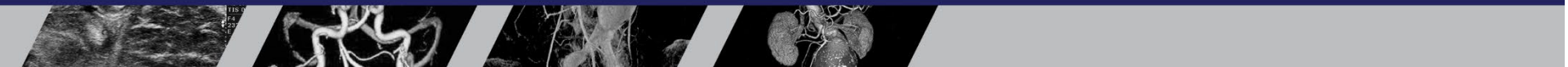
Risk factors for carotid atherosclerosis?

- Results
  - Age > 60
  - Male
  - Hypertension
  - Smoking (active or former)
  - Hyperlipidemia
  - DM



Risk factors for carotid atherosclerosis?

- Conclusion:
  - Independent risk factors for carotid atherosclerosis
    - Age > 60
    - Hypertension (leads to deposition of cholesterol in the arteries)
    - Smoking (active/former) carries 6x higher risk for carotid atherosclerosis



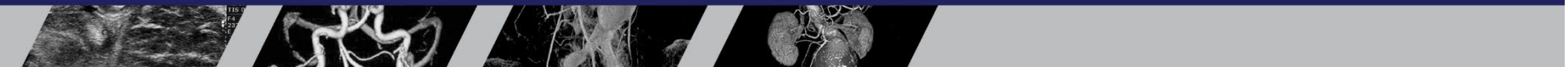
63 yr female presents to the office complaining of a single syncopal episode witnessed by her daughter. She is a nonsmoker and takes no medications.

PE: No carotid bruit noted.

YES

Why?

- This patient had syncope which may be due to carotid stenosis
  - 4 types of syncope
    - Orthostatic, Reflex mediated, Cardiac & Cerebrovascular

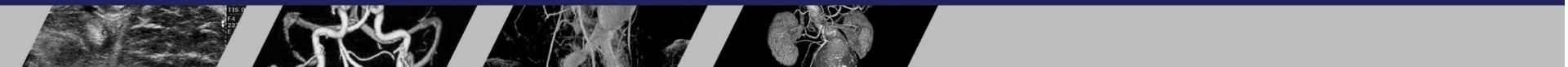


Literature?

- ***Diagnostic Utility of carotid artery ultrasonography in the evaluation of syncope: a good test ordered for the wrong reason***

  European Heart Journal Volume 16, Issue 6, June 2015, Pages 621–625

- Reviewed 495 patients with carotid duplex ordered for syncope

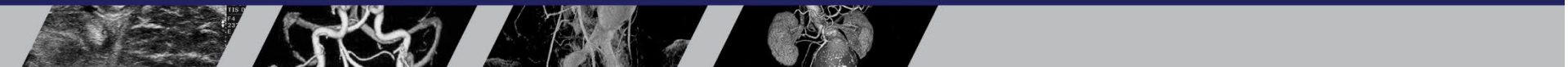


Literature?

- Results:
- 122/495 (24.7%) patients had a normal carotid duplex
- 358/495 (72.3%) patients had ICA stenosis < 70%
- 15/495 (3%) patients had ICA stenosis > 70%

Literature?

- Conclusion:
  - Carotid duplex is a low yield study for evaluation of syncope
  - Carotid duplex is helpful in diagnosis and management of atherosclerotic disease
  - Only appropriate to order carotid duplex for syncope when patients have risk factors for carotid atherosclerosis



58 yr male presents to the office for a yearly check up. He has no complaints. Denies TIA symptoms. Denies Hx of CVA. Denies lightheadedness, tinnitus, vertigo.

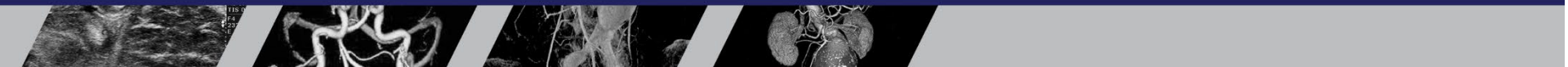
He continue to smoke 1ppd and takes no medications

PE: Harsh Rt carotid bruit appreciated

YES

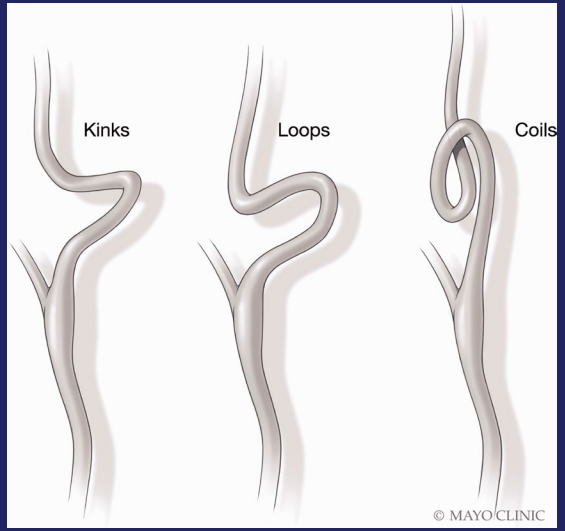
Why?

- This patient has a harsh carotid bruit which may indicate evidence of carotid atherosclerosis and may indicate a hemodynamically significant carotid stenosis



Why?

- Other causes of carotid bruit
  - Aortic valve murmur that radiates to neck
  - Cervical venous hum (turbulent flow in IJ vein due to kinking)
  - Intracranial AVM
  - Carotid artery tortuosity/redundancy

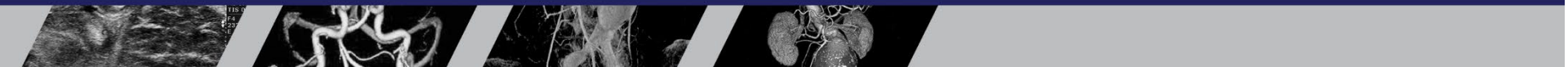


Literature?

- ***Carotid bruit for detection of hemodynamically significant carotid stenosis: The Northern Manhattan study***

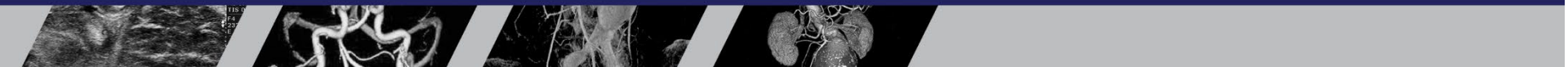
  Neurol Res 2009 Sept; 31(7) 748-752

- Aim of study was to establish a correlation between carotid bruit and diagnostic accuracy for detection of hemodynamically significant carotid stenosis



Literature?

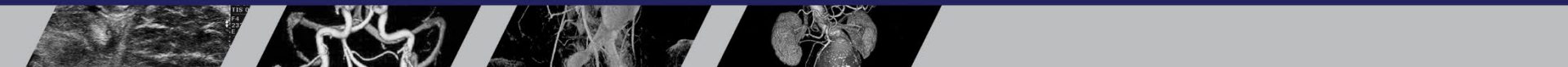
- Conclusions:
  - Patient with carotid bruit on exam have a 25% chance of having > 60% carotid stenosis on duplex.
  - Therefore, finding a carotid bruit should warrant a carotid duplex



74 yr male presents to the office complaining of neck pain and stiffness. He denies DM, HTN, Hyperlipidemia. He denies smoking. He admits that his father had a CVA.

PE: No carotid bruit noted.

NO



Why?

- This patient has no history of TIA or CVA. He has no risk factors for carotid stenosis. No bruit on physical exam and therefore doesn't warrant a carotid duplex
- Family history of stroke is not an indication for carotid duplex

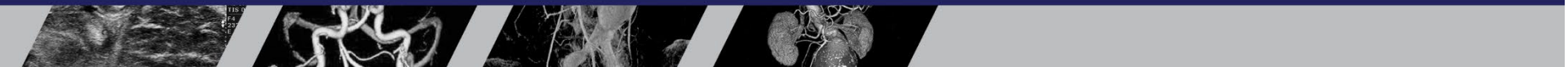
Literature?

- Screening for Asymptomatic carotid artery stenosis

  US Preventive Services Task Force (USPSTP)

  JAMA. 2021;325(5):476-481

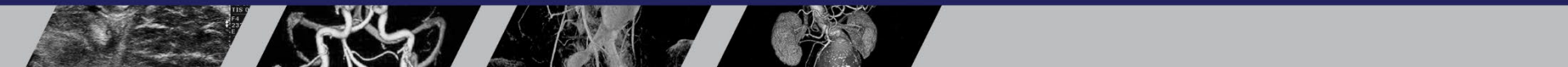
  - Task force looked at reaffirming their 2014 recommendation
  - Adults without any history of TIA, Stroke or neurologic signs or symptoms referable to carotid artery DO NOT warrant a carotid duplex



69 yr male presents to the office. Has Hx of CEA 4 years ago, but never followed up with his vascular surgeon. He is compliant with his medications. Takes ASA and statin. He denies smoking, but admits to hyperlipidemia and HTN

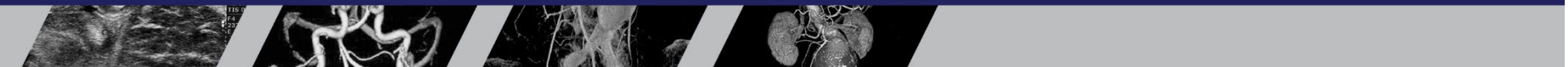
PE: No carotid bruit noted. Well healed CEA scar

YES



Why?

- This patient had a carotid intervention (CEA) and needs carotid surveillance to check for restenosis and contralateral stenosis

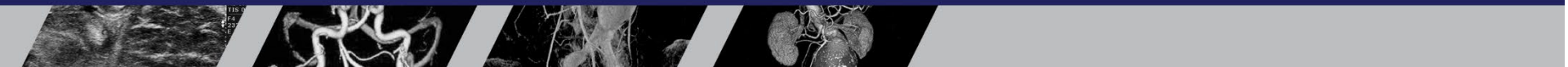


Literature?

- ***Ultrasound surveillance after CEA and CAS: what's the evidence?***

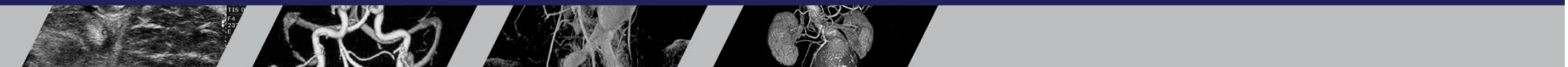
  J Cardiovascular Surg 2014 April 2014 Apr;55:33-41

- RCT that evaluated carotid duplex surveillance intervals and restenosis rates after carotid intervention



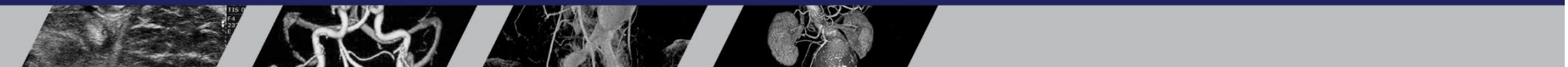
Literature?

- Results:
  - Incidence of carotid restenosis (>50%) after intervention was 1.5% per year
  - Incidence of cerebral ischemic event (TIA/CVA) was 0.5% per year



Literature?

- Conclusion:
  - Very little evidence to support routine carotid surveillance duplex after carotid intervention
  - Recommend carotid surveillance duplex at 1, 6 & 12 months
  - If patients demonstrate carotid restenosis or contralateral stenosis then they require routine surveillance duplex



72 yr male sent to your office from Ophthalmologist for plaque in the retinal artery. Pt hands you a piece of paper that reads “Hollenhorst plaque”.

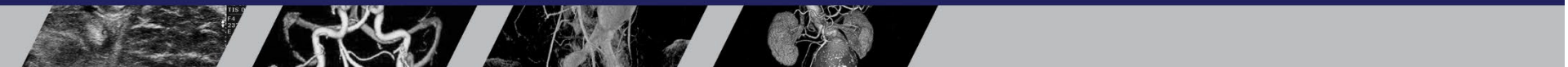
Pt denies TIA, CVA, vision changes. He admits to having HTN, Hyperlipidemia and continues to smoke 1/2ppd

PE: No carotid bruit noted.

YES

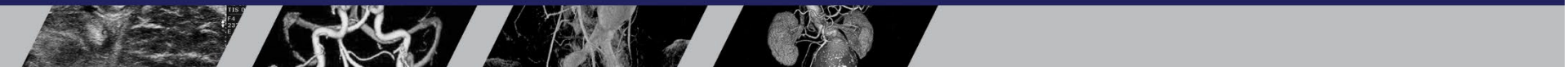
Why?

- This patient has a Hollenhorst plaque which is a cholesterol plaque that has embolized either from carotid artery or thoracic aorta
- They can cause retinal artery occlusion
  - CRAO
    - Symptom – sudden onset of painless vision loss
  - BRAO
    - Usually asymptomatic



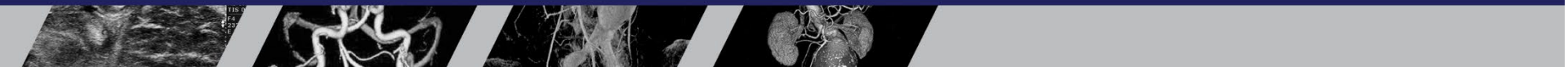
Why?

- Presence of a Hollenhorst plaque serves as a marker of prior embolization
- Therefore, a carotid duplex is indicated to evaluate for carotid stenosis



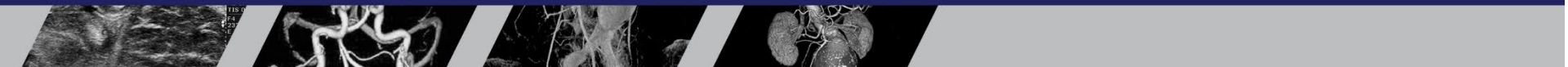
Summarize

- Indications for carotid duplex
  - Symptomatic
    - TIA, CVA, Syncope, Dizziness, Tinnitus
  - Asymptomatic
    - Risk factors for carotid artery atherosclerosis (>2)
    - Age > 60, Hypertension, Smoking (active/former), Hyperlipidemia, DM
  - Bruit on PE



Summarize

- Indications for carotid duplex
  - MISC
    - Preop for CABG patients
    - Patients with PAD, AAA, Renal artery stenosis
    - Patients after CEA or CAS
    - Radiation after head & neck malignancies
    - Trauma causing a carotid dissection
    - If Hollenhorst plaque is noted on retinal exam



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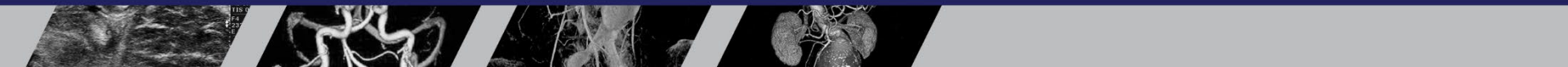
  - ~~Physical exam~~
- When is it appropriate to refer a carotid patient to vascular surgery?



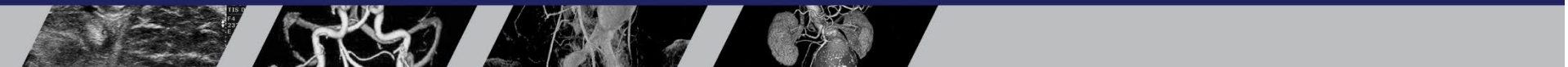
Carotid Duplex

- Results:
  - Normal carotid
  - Plaque with <50% stenosis
  - 50% to 69% stenosis
  - >70 stenosis but less than near occlusion
  - Near occlusion
  - Total occlusion

Carotid Duplex

Degree of Stenosis (%)	Primary Parameters		Additional Parameters	
	ICA PSV (cm/sec)	Plaque Estimate (%)*	ICA/CCA PSV Ratio	ICA EDV (cm/sec)
Normal	<125	None	<2.0	<40
<50	<125	<50	<2.0	<40
50–69	125–230	≥50	2.0–4.0	40–100
≥70 but less than near occlusion	>230	≥50	>4.0	>100
Near occlusion	High, low, or undetectable	Visible	Variable	Variable
Total occlusion	Undetectable	Visible, no detectable lumen	Not applicable	Not applicable

* Plaque estimate (diameter reduction) with gray-scale and color Doppler US.

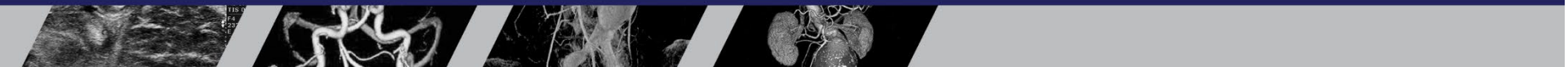


Literature?

- ***Carotid duplex ultrasound: Interpretations and clinical applications***

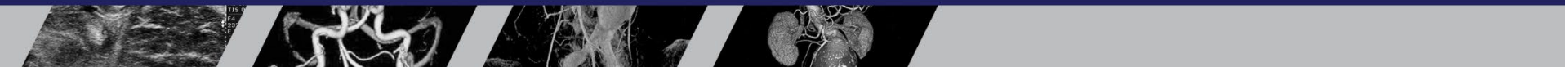
  Ann Clin Neurophyisology 2021; 23(2): 82-91

- Evaluated risk of stroke annually based on percentage of stenosis for asymptomatic patient
  - 1-2% stroke risk per year for 50-79%
  - 2-4% stroke risk per year for 80-89%
  - 4-6% stroke risk per year for 90-99%



Literature?

- What percentage of patients with carotid stenosis on PVL will continue to progress?
  - Typically 25% of patients with carotid stenosis will progress
    - Time is unknown?



Carotid Duplex

- **Normal Duplex or < 50% stenosis** → No carotid surveillance
- **50-69% stenosis** → Yearly carotid surveillance duplex and Optimize medically
- **>70% stenosis or Near Occlusion** → Referral to Vascular surgery for further management

Thank You