

Peripheral Vascular Disease in the Elderly: Diagnosis, Treatment and Pitfalls

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Disclosures

- ▶ None

Objectives

- ▶ Recognize the prevalence of PVD in the elderly
- ▶ Understand the relation of PVD to other comorbid illnesses in the elderly
- ▶ Discuss non-invasive and invasive modalities used in the diagnosis of PVD
- ▶ Discuss medications as well as non-invasive and invasive techniques to treat PVD
- ▶ Discuss nuances to treatment options in the elderly

Outline

- ▶ Case review
- ▶ Epidemiology of PVD
- ▶ Clinical presentation of PVD
- ▶ Non-invasive and invasive diagnostic tools
- ▶ Medications used in the treatment of PVD
- ▶ Non-invasive and invasive treatment options for PVD
- ▶ Pitfalls in diagnosis/treatment of the geriatric population

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Case review

- ▶ **69 yo Caucasian male presented with right leg pain worse with ambulation**
- ▶ **Past medical history**
 - ▶ HIN
 - ▶ Nephrotic syndrome
 - ▶ Dyslipidemia
 - ▶ Chews tobacco, never smoker, rare ETOH
 - ▶ Paroxysmal atrial fibrillation
 - ▶ Colon cancer s/p hemicolectomy (disease free)
 - ▶ Statin induced myopathy
- ▶ **Cardiovascular meds**
 - ▶ Aspirin 325mg po daily
 - ▶ Flecainide 50mg po bid
 - ▶ Niacin 500mg po daily
 - ▶ Atacand 32mg po daily
 - ▶ Metazalone 2.5mg po daily
 - ▶ Lasix 40mg po bid

Case review continued...

- ▶ **Family history** – diabetes, heart disease, Parkinsons
- ▶ **Physical exam**
 - ▶ BP 150/85, pulse 72
 - ▶ RRR, no r/m/g
 - ▶ No carotid or abdominal bruits
 - ▶ Femoral pulses 2+; Popliteal pulses 1-2+ right, 2+ left; DP 2+ right, 2+ left
 - ▶ BLE warm, no c/c, trace edema
- ▶ **Lab data**
 - ▶ LDL 271, Triglycerides 140, HDL 43
- ▶ **Is this patient considered at risk for PVD?**

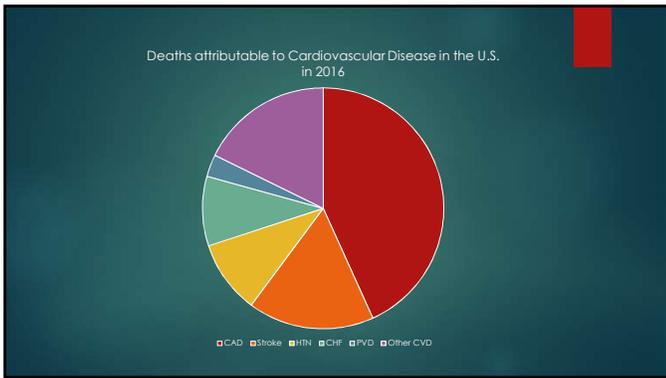
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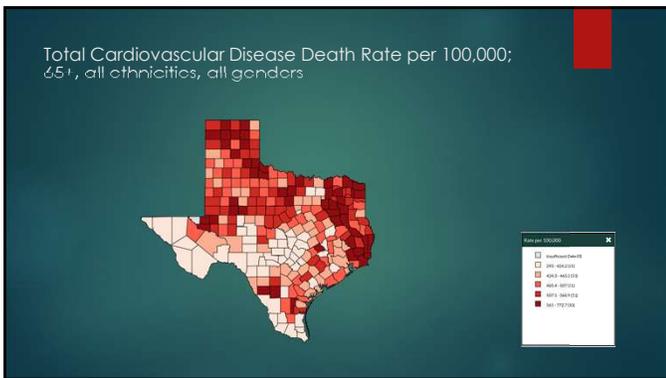
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Epidemiology of PVD

- ▶ Cardiovascular disease is responsible for more deaths per year than all cancers and chronic lower respiratory diseases combined.
- ▶ Between the years 2013-2016, an estimated 121.5 million American adults had some form of cardiovascular disease.
- ▶ In 2013-2016, 57.1% of non-Hispanic (NH) black females and 60.1% of NH black males had some form of cardiovascular disease.
- ▶ Globally, 80% of all cardiovascular related deaths occur in the low to middle income population.
- ▶ Average age at the diagnosis of PVD was 65.6 years for males and 72.0 years for females.
- ▶ Despite these seemingly grim numbers, aggressive targeting of modifiable risk factors has led to a decline in the annual death rate of CV related deaths by 31.8% (period from 2006-2016).

AHA Heart Disease and Stroke Statistics At-a-glance 2019

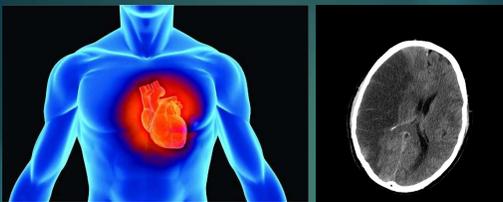




- ### Risk factors for PVD
- ▶ Modifiable
 - ▶ Diabetes
 - ▶ Hypertension
 - ▶ Hypercholesterolemia
 - ▶ Hyperhomocysteinemia
 - ▶ Obesity
 - ▶ Nutrition
 - ▶ Metabolic syndrome
 - ▶ Elevated CRP
 - ▶ Non-modifiable
 - ▶ Family history
 - ▶ Age
 - ▶ Luminal stenosis
 - ▶ Race/ethnicity
 - ▶ Gender

Specific cohorts at risk for PVD

- ▶ Age <50 with diabetes and one additional risk factor
- ▶ Age 50-69 with history of smoking or diabetes
- ▶ Age 70 and older
- ▶ Those patients with known CAD, carotid or renal artery disease
- ▶ Those patients with claudication symptoms or ischemic rest pain
- ▶ Those patients with abnormal lower extremity pulse examination



Patients >65 with PVD have a 4-fold increased risk of fatal MI and 3-fold increased risk of stroke/TIA over 10 years as compared to the general population.

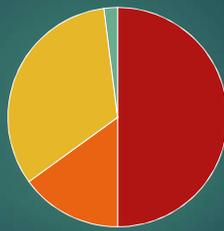
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Case review—Clinical presentation

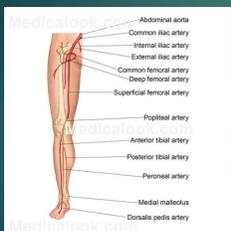
- ▶ Symptoms occurred consistently with prolonged walking; described as cramping, weakness, aching
- ▶ Symptoms relieved with rest after 5-7 minutes
- ▶ Symptoms interfering with his work (construction) and limiting his ability to enjoy camping with his family
- ▶ Has fallen several times due to "ignoring symptoms"
- ▶ No rest pain, night pain or wounds
- ▶ Had seen a chiropractor (thinking it was a back problem)

Clinical Presentations of PVD



- Asymptomatic
- Classic (typical) Claudication
- Atypical Leg Pain (functionally limited)
- Critical Limb Ischemia

Anatomy 101—Lower Extremity Arterial System



- ▶ Common iliac artery
 - ▶ Buttock
 - ▶ Erectile dysfunction
- ▶ External iliac/common femoral artery
 - ▶ Thigh and calf
- ▶ Superficial femoral/popliteal artery
 - ▶ Calf

Urgent Presentations of PVD

- ▶ Critical Limb Ischemia
 - ▶ Ischemic rest pain
 - ▶ Non-healing wound
 - ▶ Gangrene
 - ▶ Symptom duration >2 weeks
- ▶ Acute Limb Ischemia
 - ▶ Symptom duration <2 weeks
 - ▶ Five "Ps"
 - ▶ Pain
 - ▶ Pulselessness
 - ▶ Pallor
 - ▶ Paresthesias
 - ▶ Paralysis
- ▶ Confounding features:
 - ▶ Multi-level disease
 - ▶ Often absent in diabetics
 - ▶ Confused with neuropathy

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Case review

- ▶ Thinking about our patient again...
- ▶ He is complaining of claudication symptoms.
- ▶ Risk factors:
 - ▶ Age
 - ▶ HTN
 - ▶ Dyslipidemia
- ▶ How are we going to evaluate for PVD?



Comprehensive Vascular Exam

- ▶ Blood pressure check in both arms
- ▶ Auscultation of the heart
- ▶ Palpation of the abdomen
- ▶ Auscultation for bruits
- ▶ Examination of the legs and feet

- ▶ Pulse exam: Carotid, radial/ulnar, femoral, popliteal, DP, PT

Ankle Brachial Index (ABI)

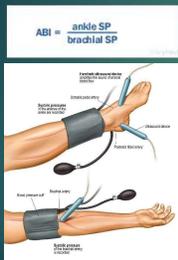


TABLE 1
Diagnostic criteria for the resting ankle-brachial index

VALUE	INTERPRETATION
1.00-1.40	Normal
0.91-0.99	Borderline Perform exercise ankle-brachial index testing if indicated
< 0.90	Abnormal—peripheral artery disease
> 1.40	Noncompressible vessels Obtain toe-brachial index to diagnose peripheral artery disease

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**Use highest arm and highest ankle systolic pressure readings

Potential Pitfalls with ABI testing

- ▶ Elderly patients frequently have non-compressible arteries (especially those with DM, CKD, etc)
- ▶ Resting ABIs may not be sensitive enough to detect mild aorto-iliac occlusive disease
- ▶ ABI values don't always correlate with degree of functional limitation (not a linear relationship necessarily)
- ▶ Normal resting ABI values in symptomatic patients become abnormal after exercise

- ▶ Exercise testing is indicated when testing is normal or borderline, yet symptoms are consistent with claudication.

Screening guidelines

- ▶ The USPSTF does not currently recommend screening in asymptomatic patients (level of evidence I).
 - ▶ Caveat: This recommendation does not include pts with DM, CVD or CKD.
- ▶ ADA Consensus Statement: PVD in pts with DM
 - ▶ Screening ABI should be performed in pts >50 who have diabetes
 - ▶ If normal, repeat q 5 years
 - ▶ Screening ABI should be considered in diabetic pts <50 who have other CV risk factors
 - ▶ Smoking, HTN, dyslipidemia or DM >10 years

Non-invasive Imaging

CT angiography



MR angiography



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Medications

- ▶ Antiplatelet therapy
 - ▶ Aspirin
 - ▶ Clopidogrel
 - ▶ Aspirin/dipyridamole
- ▶ Additional agents studied
 - ▶ Ticagrelor
 - ▶ Vorapaxar
 - ▶ Warfarin
 - ▶ Rivaroxaban plus aspirin
- ▶ Statin
 - ▶ Moderate dose statin is indicated
- ▶ Older agents
 - ▶ Cilostazol
 - ▶ Pentoxifylline

Aspirin in PVD

- ▶ Meta analysis of aspirin use in PVD
 - ▶ 18 trials, 5269 patients
 - ▶ Dose varied from 100mg to 1500mg
 - ▶ CV events RR 0.88 (0.76-1.04 NS)
 - ▶ 36% reduction in non-fatal strokes (p=0.04)
 - ▶ Mortality RR 0.98

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Risk factor modification

- ▶ Lose weight
- ▶ Smoking cessation
- ▶ Limit ETOH intake
- ▶ Good glycemic control A1C <7
- ▶ Blood pressure control
- ▶ Exercise plan

Exercise therapy

- ▶ Multiple studies have shown clear benefits
- ▶ A meta analysis published in JAMA (1995, 2009) demonstrated an increase of 179% (from 125 to 350 meters) to onset of claudication pain and an increase of 122% (from 325-723 meters) to maximal claudication pain (p<0.001)
- ▶ This represents an additional 4 blocks by treadmill.
- ▶ Intermittent ischemia as evidenced by the claudication symptoms help promote collateral circulation and improved blood flow over time.

Revascularization

- ▶ Typically seen as a last resort for patients with lifestyle limiting claudication or chronic limb ischemia
- ▶ Goals of revascularization:
 - ▶ Symptom relief
 - ▶ Improve quality of life
 - ▶ Wound healing
 - ▶ Prevention of amputation
- ▶ Strategy depends on:
 - ▶ Severity of symptoms
 - ▶ Clinical and anatomic characteristics
 - ▶ Patient preference
- ▶ Requires a multi-disciplinary approach to be successful

Revascularization options

- ▶ Surgery
 - ▶ LE bypass
 - ▶ Native vein conduit
 - ▶ PTFE graft
 - ▶ Endarterectomy
- ▶ Angioplasty
 - ▶ Balloon
 - ▶ Cryoplasty
 - ▶ Drug-coated
 - ▶ Cutting/scoring
- ▶ Stenting
 - ▶ Self-expanding
 - ▶ Balloon-expandable
 - ▶ Drug-eluting stents
- ▶ Atherectomy
 - ▶ Laser
 - ▶ Orbital
 - ▶ Rotational

Case review

- ▶ Our patient underwent ABI testing and was found to have value of 0.9 on the RLE. We discussed CTA vs MRA with his nephrologist who advised against the contrast load due to patient's CKD. An exercise regimen was attempted and Plavix was added to his regimen. Unfortunately, patient remained symptomatic and discomfort worsened.
- ▶ He was seen by his cardiologist and underwent LE angiogram with stenting of the right SFA. Symptoms resolved completely and patient continued on aspirin and Plavix.
- ▶ This gentleman has since gone on to have 3 vessel bypass, bilateral carotid endarterectomies, and is currently on dialysis due to worsening renal function. Despite this, his quality of life has been good and he has not re-experienced claudication symptoms.

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Pitfalls in the Elderly

- ▶ Communication barrier
- ▶ Exercise intolerance at baseline
- ▶ Limited mobility
- ▶ ABIs are not always diagnostic (i.e. non-compressible vessels)
- ▶ Risks of antiplatelet, antithrombotic therapy
- ▶ Invasive interventions carry higher risk of complications
- ▶ Contraindications to specific testing, interventions and/or medications
- ▶ Differential diagnosis can be a red herring (spinal stenosis, neuropathy, OA, venous claudication, muscle spasms, RLS)

Conclusions

- ▶ PVD is a common and under-recognized disease associated with increased rates of cardiovascular events. Elderly patients may be completely asymptomatic for reasons discussed previously, so the physician must exercise a high index of suspicion.
- ▶ ABIs at rest and with exercise are the crucial first step in diagnosis. This testing is easily done and does not require any fancy equipment, but results can be misleading in the elderly and they may not be able to exercise.
- ▶ Intermittent claudication should be treated with conservative methods initially (exercise, meds). Revascularization in selective or refractory cases.
- ▶ Critical and acute limb ischemia warrants aggressive intervention to include endovascular or surgical revascularization.

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Thank you!
