

History and Physical Examination in Diagnosis of Peripheral Artery Disease



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KEYWORDS

• PAD • Physical exam • Diagnosis

KEY POINTS

- Peripheral artery disease (PAD), a disease of the arteries of the extremities caused by artery obstruction, may be silent or present with an assortment of symptoms and signs suggesting peripheral artery ischemia.
- Peripheral vascular disease includes PAD and disorders of the peripheral venous system and lymphatic system.
- Generally, PAD is synonymous with arteries of the limbs and pelvis, but it can be expanded to include the renal arteries, carotid arteries, mesenteric arteries, and the aorta.
- It is imperative to recognize and treat PAD early, as appropriate management of PAD can help avoid devastating complications such as limb amputation and death.

INTRODUCTION

Peripheral artery disease (PAD), defined as obstructive disease of the arteries of the extremities, may be silent or present with an assortment of signs and symptoms suggesting peripheral artery ischemia. In patients presenting with PAD in 1 vascular territory, 35% had disease in another territory, and 50% had cerebrovascular or coronary heart disease¹ and 3% had nonfatal myocardial infarction rate.¹ Both asymptomatic PAD and symptomatic PAD are independent risk factors for increased mortality.² The worldwide prevalence of PAD is between 3% and 12%. It is imperative to recognize and treat PAD early to avoid devastating complications like limb amputation and death. Peripheral vascular disease (PVD) includes PAD and disorders of the peripheral venous system (PeVD) and lymphatic system. Generally, PAD is synonymous with arteries of the limbs and pelvis but can be expanded to include the

renal arteries, carotid arteries, mesenteric arteries, and the aorta (which are discussed in detail in elsewhere in this issue of *Interventional Cardiology Clinics*).

PATIENTS AT RISK FOR PAD

The most common etiology is atherosclerosis (collection of lipid fibrous material with or without calcification between the intima and media of large and medium-sized arteries causing focal or diffuse obstruction), although other disease processes like inflammatory, immune, and hypercoagulable disorders can cause signs and symptoms of arterial insufficiency. A multidisciplinary approach involving the primary care provider, podiatrist, vascular interventionalist, and/or vascular surgeon and plastic surgeon is ideal for the comprehensive care of the PAD patients. A thorough history and physical examination are important for identifying PAD, which is a very treatable condition. When

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recognized early and appropriately managed, complications that lead to limb loss can be minimized. All patients should have a comprehensive history taken and be examined for PAD, but patients with the risk factors shown in **Box 1** should be specifically examined for PAD.

SYMPTOMS

Symptoms of PAD depend upon the location and severity of stenosis and can be completely absent or range from mild extremity pain with moderate-to-severe exertion to limb- or life-threatening ischemia. Asymptomatic PAD usually is benign; however, the disease can progress rapidly, especially in smokers, hypertensive patients, diabetics, and patients with hyperlipidemia or chronic kidney disease.⁴

Claudication

The patient may complain of fatigue, aching, numbness, weakness, or heaviness in muscles,

Box 1
Risk factors for peripheral artery disease

Age³

- Age ≥70 years
- Age 50–69 years with a history of smoking or diabetes
- Age 40–49 with diabetes and at least 1 other risk factor for atherosclerosis

Race: African Americans (men and women) and Hispanic American women^{2,4}

Family history of a first-order relative with an abdominal aortic aneurysm or PAD

Smoking: most powerful risk predictor of PAD^{5,6}

Coronary artery disease

Carotid artery disease

Renal artery disease

Diabetes and impaired glucose tolerance^{5,6,8}

Hypertension^{5,6}

Hyperlipidemia^{5,6}

Hyperhomocysteinemia⁶

Metabolic syndrome

Chronic kidney disease, especially end-stage renal disease^{5,7}

Elevated C-reactive protein

Leriche syndrome

Cardiac arrhythmias

Hypercoagulable states

or pain of lower extremities with exertion. The primary and secondary sites of discomfort in the buttock, thigh, calf, or foot should be recorded, as well as the amount of exertion. Claudication strongly suggests PAD.

Rest Pain

Any pain of the extremities at rest and its association with the upright or recumbent positions should be carefully evaluated. Ischemic rest pain is suspected if pain at rest occurs in the foot, toes, or instep and is aggravated by extremity elevation and improved by a dependent position. Almost always, ischemic rest pain worsens with leg exercise. Usually it does not present as nocturnal pain or cramps, but sometimes the pain is worse at night and relieved by sleeping in a chair with legs in a dependent position. Rest pain strongly suggests PAD.

Ulcers

Ulcers are any poorly healing or nonhealing wounds of the legs or feet. These can be caused by PAD or PVeD.

Complaints of Skin Changes

Thin, shiny, and brittle skin; thick opaque nails; hair loss on legs; and bluish/black discoloration of the extremities may be caused by PVeD or PAD.

Impotence

Severe symptomatic bilateral aortoiliac PAD almost always causes erectile dysfunction in men. Leriche syndrome is the triad of claudication, absent or diminished femoral pulses, and erectile dysfunction.

Other Symptoms

Edema of the symptomatic extremity may be caused by PAD, PVeD, or lymphatic disorders.

Complaints of paleness on leg elevation are suggestive of PAD.

Pain, tenderness, redness, and warmth in the extremities are suggestive of deep vein thrombosis (DVT) or thrombophlebitis.

Discoloration of the skin and ankles, swelling of the legs, and feelings of dull aching pain, heaviness, or cramping in the extremities may suggest venous insufficiency.

DIFFERENTIAL DIAGNOSIS OF CLAUDICATION

The Edinburgh Claudication Questionnaire has 91% specificity and 99% sensitivity for diagnosing PAD in symptomatic patients.⁶ If the patient has pain when walking either in the calves (typical

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