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The Emperor's Limp

A Serious Disease Condition Seriously Underdiagnosed

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Claudius, the Emperor of Rome from A.D. 41-54, limped, possibly from a birth defect. His name was derived from the Latin "claudicare" meaning "to limp". Claudication has become the medical term for limping, specifically leg pain on walking due to arterial disease.

Peripheral arterial disease, if defined by the presence of atherosclerotic changes in the arteries, is a nearly universal consequence of aging, more in some than others. These changes are often focal and typically most pronounced in arteries supplying the heart, brain, and lower extremities. If atherosclerotic plaque in the lower extremities progresses to the point of restricting blood flow to the muscles, the patient may notice no symptoms at rest but recognizes pain or discomfort (claudication) during exercise, when the need for additional blood supply increases dramatically.

Peripheral arterial disease (PAD) affects a significant portion of our population, particularly those with a history of tobacco use or diabetes. Epidemiological studies indicate up to 4.5% of U.S. adults aged over 40 years old have PAD. The prevalence increases among diabetics (9.5%), non-Hispanic blacks (9.6%) and Mexican-Americans (6.8%). Prevalence of PAD roughly doubles each decade, reaching 12% for all individuals 70–79 years old and 22% among individuals over 80 years old.[1]

But PAD is not always symptomatic. If a noninvasive study, the Ankle/Brachial Index (ABI), is used to define PAD, the overall occurrence was 27% in one general medicine clinical practice.[2] A large study of patients aged 70 years or older or aged 50 through 69 years with history of cigarette smoking or diabetes were evaluated by ABI, and PAD was detected in 29%.[3] Patients with renal insufficiency are more than twice as likely to have PAD as patients with normal kidney function.[4]

The ABI is a simple but useful test for detecting the presence of disease that has reached the point of restricting blood flow to the extremities. If the systolic pressure at the ankles is less than that in the brachial artery the ABI will be less that 1. An index of less than 0.90 is usually considered positive.

While it is a very good test, the ABI does not detect all of those patients with PAD. Calcification of the arterial wall, frequently encountered in diabetic patients, can be so severe the artery becomes incompressible and an ankle pressure cannot be obtained, or the pressure is falsely elevated. And, patients with PVD can have normal ankle pressures at rest but still demonstrate a significant drop in pressures following exercise.

Claudication due to PAD is usually consistent, a similar pain occurring in the same muscle group (calf, thigh or buttocks) at the same distance each time the patient walks. Symptoms are relieved with a few minutes rest. Over time, symptoms may increase and the distance to onset decreases as the disease progresses. "Pseudo-claudication" is a term frequently used when the symptoms are due to neurologic problems such as spinal stenosis. Symptoms due to nerve problems are usually inconsistent, with some "good" days and some "bad". Patients with back problems frequently do better walking with something to lean on while ambulating, such as a shopping cart.

Only half or less of patients with PAD have the classic symptoms of claudication. Sedentary or non-ambulatory patients will not experience claudication, and some patients develop collateral pathways for blood flow that minimize symptoms. Decreased or absent femoral, popliteal, or tibial pulses, a bruit in the abdomen, groin, thigh or popliteal fossa are physical findings that may indicate PAD in patients with or without claudication. Non-healing wounds of the feet or ankles may be another indication. And aorto-iliac disease may result in erectile dysfunction.

The differential diagnosis for pain on walking includes neurological causes; spinal stenosis, radiculopathy, peripheral neuropathy, and musculoskeletal causes; muscle injury, connective tissue disorders, or osteoarthritis, as well as vascular causes. Noninvasive vascular studies, including ankle/brachial indexes before and after exercise, can establish arterial insufficiency as the source of the problem. Duplex imaging can provide specific information regarding severity and location of arterial obstructions. Other diagnostic procedures are magnetic resonance angiography, computed tomography, and digital subtraction angiography.

When symptoms are present, they do not usually progress rapidly over time. In a series of patients with PAD followed for 5 to10 years, over 70% reported either no change or improvement in their symptoms.[5] But PAD is not a benign disease. It can significantly affect quality of life. It can be devastating for occupations that require walking distances. Social activities, such as golf or dancing, may be limited, and

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the decrease in exercise tolerance may lead to obesity and decreased cardiovascular health. Vasculogenic impotence can seriously impact relationships and the patient's sense of well-being.

Risk factors for PAD are the same as for cerebrovascular, aortic, renal and coronary artery disease; age, family history, dyslipidemia, cigarette smoking, hypertension, and diabetes. Modification of risk factors is an important first consideration in treatment. Beyond this, PAD can be treated with exercise, pharmacotherapy, and, if indicated, surgical or percutaneous intervention. Invasive procedures are not always necessary for PAD patients. Particularly for patients that are asymptomatic, or not disabled by their symptoms, a life style change (smoking cessation, exercise program, diet) may have a greater impact on outcome. Combined with blood pressure and cholesterol management, this approach can significantly lower the risk of other cardiovascular problems as well.

Peripheral arterial disease can lead to limb threat or amputation, but the implications of PAD go far beyond that. Atherosclerosis is a systemic disease, and, as a marker for other cardiovascular problems, PAD is very significant. "Patients with PAD are at triple the risk of all-cause mortality and at more than 6 times the risk of death from coronary heart disease as those without the disease, yet PAD is probably the most underdiagnosed and least aggressively managed atherosclerotic disease." [6] The risk for stroke is 2 to 3 times greater.[7] Community-based studies have repeatedly demonstrated that an abnormal ankle-arm index identifies those at high risk for death and cardiovascular morbidity.[8]

The question is not whether the emperor is wearing clothes, but is that limp a source of concern?

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