A 62-year-old man presents with painful cramps in his left lower leg that began about 6 months earlier and have recently become more frequent. The cramps occur with vigorous walking and cease when he stops for several minutes. He has experienced them during the active aspects of his work as a deli owner and when walking uphill while playing golf. He does not have cramps at night while asleep. He has no chest pain or symptoms of congestive heart failure.

HISTORY
The patient has mild hypertension that is well controlled by low doses of a β-blocker. His blood glucose level has on occasion been in the "borderline diabetes" range but has always normalized with weight loss. He has smoked 1 or more packs of cigarettes a day for at least 30 years and has 1 alcoholic drink daily.

PHYSICAL EXAMINATION
This well-appearing man has normal vital signs, including a blood pressure of 132/76 mm Hg. Head, ears, eyes, nose, and throat are normal. Carotid pulses are strong and symmetrical without bruits. Chest is clear; heart rate is 64 beats per minute and regular, without murmurs or gallops. Abdomen is soft, without masses or organomegaly. Extremities are of normal color and temperature bilaterally, with symmetrical hair distribution. Femoral pulses are strong and symmetrical bilaterally, without bruits; however, the left popliteal pulse is diminished compared with the right popliteal pulse and also compared with the left dorsalis pedis and posterior tibial pulses.

LABORATORY RESULTS
A hemogram is normal, as are the results of a serum chemistry panel. A random blood glucose measurement is 98 mg/dL. The total cholesterol level is 220 mg/dL, with a low-density lipoprotein cholesterol level of 167 mg/dL and a high-density lipoprotein level of 45 mg/dL.

Which of the following is the most appropriate next step?
A. Initiate aspirin, 325 mg/d, and clopidogrel, 75 mg/d.
B. Obtain an MRI study of the lumbosacral spine.
C. Order Doppler ultrasonography of the leg veins and a plasma D-dimer assay.
D. Perform pressure measurements and calculate the ankle-brachial index.

(Correct answer on next page.)
CORRECT ANSWER: D

This patient's symptoms—specifically, intermittent claudication—suggest peripheral arterial disease. He is one of the approximately 20% of patients who present with "classic" symptoms of deep leg muscle pain that is relieved within minutes by rest. Most patients present less typically with any of a variety of complaints, such as "leg tiredness" and difficulty in walking.1,2

Diagnosis of intermittent claudication. The recommended initial screening test for peripheral arterial disease is the calculation of the ankle-brachial index (choice D). This test is performed by measuring systolic blood pressures in the arm and leg and then calculating the ratio of the highest ankle pressure to the highest brachial pressure. Ratios above 0.90 are normal, and any value less than this confirms peripheral arterial disease. Disease severity can also be gauged from the ankle-brachial index:

- 0.71 to 0.90, mild disease.
- 0.41 to 0.70, moderate disease (most patients with claudication have values in this range).
- 0.00 to 0.40, severe disease.3

A number of more invasive procedures provide more detailed physiological and anatomical information. These include computed tomographic angiography/ magnetic resonance angiography.
and the gold standard, digital subtraction angiopathy, which requires the use of contrast. These studies are usually reserved for patients in whom the diagnosis is uncertain and for those in whom surgical intervention is being contemplated.\(^2\),\(^3\) Claudication-like symptoms, particularly in elderly patients, can be the presenting complaints of spinal stenosis. The preferred diagnostic technique for this condition is MRI of the lumbosacral spine (choice B). However, spinal stenosis usually causes effort-related discomfort in the buttocks, hips, and thighs. Moreover, symptoms are often elicited, not just by exercise, but also by standing—in contrast to intermittent claudication, in which walking and exercise are required to elicit symptoms. Thus, spinal stenosis is less likely in this patient.

Doppler ultrasonography and a plasma d-dimer assay (choice C) are used in the diagnostic evaluation of deep venous thrombosis (DVT). Although the physical findings in DVT can be variable, one would expect some warmth, redness, and dependent edema, none of which are present here. Also, it would be extremely rare for DVT to evolve over a course of several months without resolving or—more likely—worsening into a more ominous condition.

**Treatment of peripheral arterial disease.** Therapy for peripheral arterial disease initially includes risk-factor modification, an exercise program, and antiplatelet therapy. This patient is a very good candidate for risk-factor modification. He is a heavy smoker and should be helped to quit. His lipid levels are suboptimal and need to be lowered by a combination of diet and pharmacotherapy (eg, statins). If he indeed has diabetes, good glycemic control is needed.

Antiplatelet therapy is indicated in patients with peripheral arterial disease; it reduces the risk of death from all vascular causes (eg, myocardial infarction, stroke) by 25%.\(^4\),\(^5\) Aspirin is usually the first-choice agent, but clopidogrel is also quite effective. However, current data do not show an additional benefit from use of the 2 agents together (choice A), and there is a consensus that such therapy is not appropriate.

A variety of surgical techniques are available. These include percutaneous transluminal stenting and full surgical bypass grafting. Surgery may be tried when medical therapy has failed or when symptoms significantly interfere with a patient’s job and lifestyle.

**Outcome of this case.** The patient's ankle-brachial index was 0.60, confirming the diagnosis of peripheral arterial disease with intermittent claudication. Aspirin, 325 mg/d, and simvastatin, 20 mg/d, were started. Dietary modification resulted in a prompt 20-lb weight loss, and after 2 months levels of all metabolic markers had markedly improved. The patient also started an exercise program. He still experiences claudication, but less often. Family members have assumed some of his work responsibilities, and medical management remains his choice at this time.

**References:**


**Links:**

[1] [http://www.diagnosticimaging.com/authors/ronald-n-rubin-md](http://www.diagnosticimaging.com/authors/ronald-n-rubin-md)