PERIPHERAL VASCULAR COMPLICATIONS

Peripheral vascular disease (PVD) is the clinical term for atherosclerosis of the large arteries of the leg. Risk factors for PVD are the same as those for atherosclerosis of the coronary arteries, i.e. hypertension, diabetes, smoking, hyperlipidemia, older age, and family history. Due to atherosclerosis in the peripheral vasculature (specifically, the iliac, femoral, and popliteal arteries), PVD causes decreased blood flow to the lower extremities and can lead to intermittent claudication. Often referred to as “angina of the legs”, claudication involves lower extremity muscle pain during times of high metabolic demand (such as walking); the decreased blood flow is not able to provide the adequate oxygen and nutrients that the hard-working muscles require. Unless severe PVD exists, claudication is typically relieved by rest, which lowers the muscles’ metabolic requirements.

More information about the peripheral vascular complications of diabetes is discussed in the following articles:


History:
A patient with PVD will often present with exercise-induced pain or tightness in muscles of the lower limb, i.e., claudication. Often patients can quantify the amount of walking required to bring on pain by the number of blocks walked when the pain arises. Symptoms usually occur in the calf, but may be as high as the thigh or even buttock. For unclear reasons, the upper extremities are not usually affected by PVD. Patients with PVD may also complain of foot ulcers that do not heal. Because of atherosclerosis, the amount of blood flow to the ulcerated region is inadequate to heal the ulcer.

Physical Exam:
Inspection alone can be very telling in PVD: the decreased blood flow to the lower extremities may lead to selective loss of leg hair, causing the skin to appear shiny. In addition, there may be ulcers that do not heal over time.

Finally, another result of the decreased blood flow is that peripheral pulses will be diminished.

Tests:
A history indicating exercise-induced pain in the muscles of the leg, which is relieved by rest, is generally a reliable indicator of PVD. However, measurement of the ankle-brachial index, comparing resting and post-exercise systolic blood pressures in the ankle and arm, can confirm the diagnosis.

If revascularization is being considered to treat a patient’s PVD, an arteriogram of the arteries supplying the lower extremities may be ordered to guide the intervention. (Compare the narrowed iliac artery in Figure 1 to the same artery after stent placement in Figure 2.)

Treatment:
Because PVD is highly correlated with cardiovascular disease, the use of aspirin may be warranted to protect against cardiac events. Unfortunately, aspirin does not decrease the symptoms from claudication. A medication that has been shown to decrease claudication symptoms is cilostazol (a phosphodiesterase inhibitor).

Since atherosclerosis is the underlying cause of PVD, improving control of modifiable risk factors – hypertension, hyperlipidemia, smoking, and of course, diabetes – can be quite beneficial.

If none of the above treatments improves the patient’s claudication, or if there is pain at rest, gangrene, or persistent foot ulcers that fail to heal, revascularization may be indicated. This may be done by either angioplasty or surgery (with use of artificial bypass grafts).
Self Assessments:
Which of the following would be LEAST LIKELY to occur in a patient with peripheral vascular disease?

A. Exercise-induced pain in the calf
B. Exercise-induced pain in the buttock
C. Loss of leg hair
D. Loss of arm hair
E. Non-healing foot ulcers

Explanations:
A. Incorrect. This pain results from ischemia due to the compromised blood flow to the region.
B. Incorrect. This pain results from ischemia due to the compromised blood flow to the region.
C. Incorrect. With compromised blood flow, hair cells can no longer obtain adequate nutrients to stay alive.
D. Correct! Since peripheral vascular disease affects mainly the lower extremities, ischemia-induced hair loss in the upper extremities is not expected.
E. Incorrect. Because of atherosclerosis, the amount of blood flow to the ulcerated region is inadequate to heal the ulcer.

Revascularization:

A. Is a first-line treatment for peripheral vascular disease
B. May involve an arteriogram of the affected artery
C. Is indicated only if the patient complains of leg pain at rest

Explanations:
A. Incorrect. Unless there are serious warning signs, such as rest pain, gangrene, or non-healing foot ulcers, risk factor management and pharmacologic intervention should be tried prior to revascularization
B. Correct! An arteriogram indicates the area and severity of blockage, thus providing critical knowledge to the doctors performing an angioplasty.
C. Incorrect. Revascularization is indicated if there is: pain at rest, gangrene, or persistent foot ulcers that fail to heal.