

Understanding Peripheral Artery Disease (PAD) and Venous Disease

Peripheral artery disease (PAD) is a common but often underdiagnosed circulatory condition that affects millions of people worldwide. While PAD can significantly impact quality of life, many people may not recognize the symptoms or understand the potential consequences. Another consideration is venous disease, which has distinct considerations apart from PAD.

In this article, Jamil Matthews, MD, a vascular and endovascular surgeon with Salinas Valley Health, discusses the causes, risk factors, signs to watch for, and the importance of early diagnosis and treatment in managing these progressive diseases.

Key Difference Between PAD and Venous Disease

Peripheral artery disease and venous disease both affect the body's blood vessels but involve different systems. Arteries carry oxygen-rich blood from the heart to the body's tissues, while veins return oxygen-depleted blood back to the heart. PAD specifically refers to a condition affecting the arteries, where a buildup of atherosclerotic plaque or calcium narrows the vessels and reduces blood flow to the limbs, potentially impairing tissue function.

"This can result in a wide spectrum of presentations. You can have pain with walking, which we call claudication, pain at rest in really severe circumstances where the tissue is so choked of blood because of the disease that even without activity you start to feel pain," explains Dr. Matthews. "In the worst situations, you can develop wounds, which can often lead to amputation."

Venous insufficiency occurs when the valves in the veins—especially those in the lower legs—don't function properly, allowing blood to flow backward instead of returning to the heart. Since blood must travel upward against gravity, the body relies on calf muscle contractions and one-way valves to assist this movement. When the valves fail, blood pools in the legs, leading to symptoms like swelling, varicose or spider veins, skin discoloration, and, in severe cases, ulcers or even amputation.

Important Risk Factors

Smoking is one of the most significant risk factors for PAD, as it triggers inflammation in the blood vessels through repeated exposure to harmful particulates, ultimately contributing to plaque buildup and reduced blood flow. Other key risk factors include high cholesterol, hypertension, diabetes, end-stage renal disease (both of which can lead to vessel calcification and stiffness), as well as age and genetic predisposition.

"Often, my patients will come in either with PAD or venous insufficiency and will tell me they have family members who have had similar symptoms or have undergone the treatments I'm recommending," notes Dr. Matthews.

What Are the Symptoms of PAD and Venous Disease?

While a medical diagnosis is essential, patients play a vital role in recognizing their own symptoms early. In PAD, one of the most common signs is the claudication mentioned above—pain in the calves, thighs, or buttocks that occurs with walking and eases with rest. This pain results from the muscles' increased need for oxygen during activity, which damaged arteries can't supply. As PAD progresses, symptoms can

worsen to include rest pain—a more serious condition marked by numbness or pain in the toes even when not active, indicating severely reduced blood flow.

“It's the last stop on the subway train, right? It's the last spot where the blood is going to make it to, and that area is being choked of blood, even at rest. So, the basic metabolic requirements that those toes need at rest cannot be fulfilled by what the blood vessels are able to provide at that time,” shares Dr. Matthews. “Then, the most severe case means you're not only feeling pain, but now you can't even keep the tissue alive. You start to form ulcers and wounds and gangrene of the toes. In those situations, amputation is the only answer.”

Venous disease also exists on a spectrum. In mild cases, it may present as varicose veins—often due to discomfort or cosmetic concerns. As venous reflux worsens, symptoms can progress to leg swelling (edema), fatigue, pain and itching. A classification system called CEAP helps describe these stages.

In more advanced cases, patients may develop skin discoloration—particularly above the ankles—caused by iron deposits from pooled blood. At its most severe, the condition can lead to skin breakdown and leg ulcers due to prolonged swelling and poor circulation.

How Are These Diseases Diagnosed?

A thorough physical exam and patient history are essential for diagnosing peripheral artery and venous disease, making it important to see a vascular specialist. Understanding when symptoms occur, such as with walking, helps guide the evaluation.

Noninvasive imaging techniques—especially duplex ultrasound—play a key role in diagnosis. For arteries, ultrasound shows narrowing or blockages and helps plan treatment. For veins, it can detect reflux or compression. Additional tests like angiograms and ankle-brachial indices (ABI) may be used to further assess blood flow and guide care.

“What it tells us is several things. Does this patient have peripheral artery disease? Is it significant? And, it helps us determine if the issue requires further studies to figure out the best treatment,” states Dr. Matthews.

How Are PAD and Venous Disease Treated?

Many patients see significant improvement with conservative, non-surgical treatments, making it essential to work with a vascular specialist who understands both the procedures and the underlying causes of arterial and venous disease. For PAD, initial treatment often involves lifestyle changes—quitting smoking, eating a heart-healthy diet, and engaging in at least 25 minutes of daily cardiovascular activity—along with optimizing medications like aspirin and statins. If symptoms persist, more advanced interventions such as angiograms or surgery may be needed.

For venous insufficiency, treatment typically begins with compression therapy, which helps reduce swelling, relieve symptoms, and promote wound healing. “That together is very important in the patient's progression and making them feel better following treatment. What we have found is that if you put a patient on a physician-monitored, medically-appropriate compression trial for three months, a large portion of those patients will not require any further treatment,” assures Dr. Matthews.

Advancements in Vascular Surgery Ensure Optimal Outcomes

One of the most significant advancements in vascular surgery is the rise of endovascular procedures. Treatments that once required lengthy open surgeries can now often be performed in a catheterization lab, dramatically reducing risk—especially for patients with heart or lung conditions who may not tolerate general anesthesia well.

In venous disease, minimally invasive options like radiofrequency ablation and medical glue have transformed care. This allows patients to be treated in outpatient settings, with procedures lasting around 30 minutes and minimal recovery time.

“There are a large number of devices that receive FDA approval every year, which allow us to do these minimally invasive procedures much more quickly and efficiently than before,” concludes Dr. Matthews. “Ultimately, I think it's important for patients to understand they are their best advocate. If you notice symptoms, especially the symptoms described here, make sure you see a vascular specialist immediately.”

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