The Vascular Education Foundation was established to increase awareness of the dangers and severity of vascular disease through the education of both the community and healthcare professionals.

The VEU

The Vascular & Endovascular Update

Spring 2021

Buerger's Disease: What Physicians Need To Know

It took 56 years after pathologist and surgeon Leo Buerger identifed smoking and tobacco products as deadly for the Surgeon General to release a warning about their health effects.

Over 7,000 biomedical literature articles had already made the connection, but oddly, many in the medical community were still endorsing and recommending cigarettes as a stress reliever in the 1950s and 1960s.

Finally, in 1969, health warnings on tobacco products were mandated by law. These warnings stated that smoking was a cause of lung and laryngeal cancer in men, lung cancer in women and the most important cause of chronic bronchitis.

Who is the Surgeon General who released the 1964 report on the health effects of smoking? Follow our social media for the answer!

In 1908, Leo Buerger studied the similarities of eleven amputation cases at Mount Sinai Hospital in New York. He noted that all of the amputee patients were heavy smokers and determined that the tobacco use was the root cause of their ailments. From the dermal system to respiratory, from cardio and pulmonary to neuro to renal, Buerger determined that tobacco use wreaks havoc on the human body.

Today, 113 years after Buerger's research, most patients still immediately think of lung cancer as the most likely health effect of smoking.

The health community, however, has known for decades that tobacco use, whether that be smoking, chewing, or just sucking on the end of a cigar, has a negative effect on every system in the human body.

In the United States, about 12 to 20 people per 100,000 are affected with Buerger's disease also known as thromboangiitis obliterans. It is more common in countries where cigarette smoking is heavier such as in Asia and the Middle East.

Buerger's disease is a non-atherosclerotic inflammatory disorder that affects small and medium sized vessels of the extremities. Although the exact etiology is unknown, a strong association with smoking has been noted. Buerger's disease typically affects men between 25 and 45 years of age; however, some recent studies have reported an increase in the prevalence of the disease in women ranging from 11-23%.

The underlying pathophysiology of Buerger's disease appears to involve endothelial injury from the carbon monoxide and nicotine contained within cigarettes. This injury to the endothelium results in vasospasm, hyperplasia and eventual thrombosis of the medium and small vessels of the extremities. This resultant obliteration of the vessel lumen leads to arteritis and ischemia. Not only are the arteries and veins of the extremity involved, but it is nerve involvement that typically results in the pain patients present with.

Consider Buerger's Disease when

your patient describes pain, often severe, in their hands and feet that sometimes radiates. This pain may occur whether they are walking or at rest. Especially when the patient is a heavy tobacco user, Buerger's Disease may be the diagnosis.

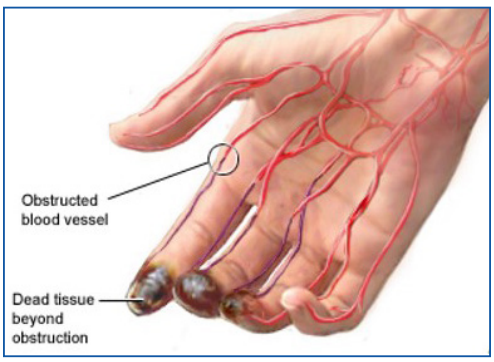
How Tobacco Attacks The Body

Aside from the 70 chemicals in tobacco that are known to cause cancer, cigarettes also contain toxins like carbon monoxide, tar and nicotine. Tar is the sticky brown residue that builds up on a smoker's lungs, fingers and teeth.

Nicotine is a highly addictive chemical that attacks the lungs and reduces a person's breathing capacity, causing diseases such as emphysema.

Carbon monoxide and nicotine both cause narrowing of blood vessels by thickening arterial walls, resulting in less oxygenated blood traveling through the body. This reduced circulation makes it more difficult to take deep breaths, and more difficult for the heart to pump blood – especially to the hands and feet.

Decreased circulation and less oxygen throughout the body causes blood clots in the legs and arms, resulting in tissue damage, and a myriad of other harmful side effects like pulmonary emboli, severe pain in the hands and feet, and cardiac events.



Symptoms

In addition to pain and numbness in the hands and feet, your patient might also exhibit any of the following:

- Pale, reddish, or blue hands or feet
- Hand, arm or calf claudication and/or pain at rest
- Fingers or toes that turn pale when cold (Raynaud's phenomenon)
- Painful open sores on their hands and feet

Risk Factors

Patients diagnosed with Buerger's are likely to have one or more of these risk factors:

- Male gender
- Smoke more than 1 and a half packs of cigarettes each day
- Roll their own, no-filter cigarettes with raw tobacco
- From Mediterranean, Middle East or Asian regions
- Less than 45 years of age
- Have a history of chronic gum disease

Diagnosis of Buerger's Disease

Because Beurger's disease can be mimicked by a wide variety of other diseases that cause diminished blood flow to the extremities, aggressive evaluation to rule out other causes of the patient's symptoms are necessary.

Rheumatologic blood testing is necessary to rule out autoimmune diseases such as scleroderma, CREST syndrome, lupus, rheumatoid arthritis, antiphospholipid antibody syndrome and a variety of other forms of vasculitis. Often, a hypercoaguable workup is necessary.

An echocardiogram should be done to rule out cardioembolic sources. Presence of diabetes and atherosclerotic peripheral artery disease should also be evaluated.

If Beurger's disease is being considered, an angiogram is performed of the affected and unaffected extremities.

Because Buerger's disease is a diagnosis of exclusion, several diagnostic clinical criteria have been established with the Olin Criteria being commonly used. These criteria include:

- age less than 45
- current or recent history of tobacco use
- presence of distal extremity ischemia or gangrene
- exclusion of autoimmune diseases, hypercoagulable states and diabetes
- exclusion of proximal source of emboli
- angiographic findings consistent with medium to small vessel segmental occlusion with the presence of "corkscrew collaterals"

Treatment

Discontinuation of tobacco and nicotine use is the only definitive therapy for Buerger's disease. The use of even a few cigarettes a day may result in continued disease progression. Of patients who continue to smoke, progressive disease leading to gangrene and subsequent amputation can be as high as 40 to 50%.

Conversely, patients who discontinue smoking have a much lower risk of amputation (5-6%). Surgical revascularization is not usually necessary nor feasible in patients with Buerger's disease

because of the distal and diffuse nature of the disease.

Patients who do undergo revascularization tend to have extremely poor results. Additional therapies include vasodilators such as iloprost, bosentan, calcium channel blockers, alpha blockers and sildenafil. However, only iloprost has been studied prospectively demonstrating a reduction in need for amputation. Bosentan demonstrated early promising results but has not been studied on a large scale. Epidural spinal cord stimulation has been shown to improve regional perfusion in some patients with this disease.

Peripheral sympathectomy can be occasionally considered for patients with refractory pain and digital ischemia, but this treatment method remains controversial.

Patient education on the effects of continued tobacco and nicotine on their disease is paramount. Individualized strategies for smoking cessation need to be developed including inpatient and outpatient treatment in specialized institutions with multidisciplinary teams if possible.

Adjunctive measures to assist patients in smoking cessation should play a central role in their treatment plan. Pharmacotherapy using non-nicotine replacement therapy using bupropion (Wellbutrin) or vareniciline (Chantix) should be partnered with patient involvement in smoking cessation groups, acupuncture or hypnotherapy. Counseling of the patient's family and support network is important to maintain compliance.

In some instances, urinary nicotine/cotinine levels may need to be checked if the disease continues to progress despite claims of smoking cessation.

Your Patient's Buerger Disease Team Should Include:

- Vascular specialist/surgeon
- Rheumatologist to treate inflammation
- Wound care specialist
- Nicotine independence counselor

Without aggressive smoking cessation and treatment efforts, Buerger's disease leads to severe pain, tissue damage and gangrene. Prompt and proper treatment will preserve your patient's limbs and quality of life.

Educate your patients about Buerger's by supplying an informational bookmark when you see a patient who may be at risk. Email your mailing address to vascular.edu.foundation@gmail.com. We'll send you a free packet of 50 bookmarks to help you provide exceptional patient care.

About the author, Dr. Sanjeev Pradhan

Board-certified in both vascular and endovascular surgery, **Dr. Sanjeev Pradhan** earned Vascular and Endovascular Fellowships at Yale University School of Medicine in New Haven, Connecticut.

Dr. Pradhan is the first surgeon in Chicagoland to use fenestrated stents to treat abdominal aortic aneurysms. He also designed a unique hybrid vascular surgery suite that integrates advanced imaging techniques with a traditional operating room setting.

When you have questions about Buerger's disease or any vascular condition for your patients, please reach out to Dr. Sanjeev Pradhan at 815-824-4406.

Inside:
What Is The Most Common Risk Factor For Buerger's Disease and How Is It Best Treated?

You're invited to LEA-UP
Lower Extremity Amputation and Ulcer Prevention

LEA-UP meets quarterly to learn from experts in the fields of podiatry, infectious disease, primary care, nephrology, vascular surgery and more.

Wednesday, August 11, 2021, 6:30 pm

Discussing

"Non-Atherosclerotic Disease"

CME CREDIT OFFERED

Reserve your seat and get location confirmation by emailing Jacky!
jdelreal.vascular.edu.fdn@gmail.com

VASCULAR EDUCATION FOUNDATION
vasculareducationfoundation.org
8505 - 183rd Street, Suite A
Tinley Park, IL 60487