CONDITION

Buerger's disease

Learn how Buerger's disease affects blood flow to the hands and feet, including symptoms, diagnosis, tobacco cessation, treatment, and when to seek urgent care.

WHAT IT IS
Rare inflammatory blood vessel disease of the limbs

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Limb pain, cold fingers or toes, skin color changes, nonhealing sores

WHAT CAUSES IT
Unknown, with immune involvement

HOW IT IS DIAGNOSED
Blood vessel imaging and exclusion of other conditions

MAIN TREATMENT
Complete tobacco cessation

CAN IT BE CURED?
No, cessation can prevent further attacks

IS IT AN EMERGENCY?
Sometimes, with sudden severe loss of blood flow

LONG-TERM OUTLOOK
Quitting greatly reduces amputation risk, but advanced disease may require amputation

Overview

Buerger's disease is a rare condition in which blood vessels in the arms and legs become inflamed and blocked. Its medical name is thromboangiitis obliterans . It usually affects small and medium-sized arteries, which carry blood to tissues, and veins, which return blood to the heart.

The blocked vessels reduce the supply of oxygen-rich blood to the fingers, hands, toes, and feet. This can cause pain, skin changes, sores that do not heal, and tissue damage. The disease may affect more than one limb and can move between different areas over time.

Buerger's disease is strongly linked to tobacco exposure. Most people diagnosed with it currently use or previously used cigarettes or another tobacco product. Continued exposure can allow the disease to progress. Completely stopping tobacco is the most important step for

protecting the affected limbs.

The condition differs from the more common peripheral artery disease caused by a buildup of fatty plaque, called atherosclerosis. Buerger's disease often develops at a younger age and mainly affects vessels farther from the center of the body.

Symptoms

Symptoms depend on which blood vessels are blocked and how much blood flow has been reduced. They may develop gradually or worsen during periods of active inflammation.

Common symptoms include:

Some people develop Raynaud phenomenon . This means the fingers or toes change color and may become numb or painful in response to cold temperatures or stress.

Another possible sign is superficial thrombophlebitis , an inflamed clot in a vein close to the skin. It may appear as a tender, red, firm area that seems to move from one location to another.

Severely reduced blood flow can cause skin and deeper tissues to die. This is called gangrene . The area may become dark, numb, painful, or foul-smelling, particularly if infection is present.

These symptoms can also result from many other blood vessel, nerve, joint, or skin conditions. A medical evaluation is needed to identify the cause.

- Pain or cramping in the feet, calves, hands, or forearms during activity
- Burning, tingling, or numbness in the fingers or toes
- Pain in a foot, hand, finger, or toe while resting
- Fingers or toes that feel unusually cold
- Pale, red, or bluish skin color
- Painful sores on the fingers or toes that heal slowly
- Sensitivity to cold

Causes and risk factors

The exact biological cause of Buerger's disease is not fully understood. The immune system appears to contribute to inflammation and clot formation inside affected blood vessels. Genetic and environmental factors may also influence who develops the disease.

Tobacco exposure is the main established risk factor. Buerger's disease has been associated

with cigarettes, cigars, pipes, chewing tobacco, and other tobacco products. Even a small amount may keep the disease active in someone who has it.

Nicotine can narrow blood vessels. For this reason, vaping and nicotine-containing smoking-cessation products may not be appropriate for some people with Buerger's disease. A clinician can recommend a cessation plan that avoids ongoing nicotine exposure when necessary.

People should also tell their clinician about cannabis use. Cannabis-related blood vessel disease has been reported, particularly with smoked cannabis, although the relationship is less clearly defined than the link with tobacco.

Buerger's disease has historically been diagnosed most often in men younger than 45 to 50. However, it can occur in women and in people outside that age range. It is more common in regions where tobacco use is widespread.

Diabetes, high cholesterol, and high blood pressure are major risk factors for atherosclerotic artery disease. They are not considered causes of Buerger's disease, but they may affect overall blood vessel health and influence the diagnostic evaluation.

Diagnosis

There is no single blood test that confirms Buerger's disease. Diagnosis is based on the pattern of symptoms, tobacco exposure, examination findings, blood vessel imaging, and the exclusion of other conditions.

A clinician will ask when symptoms began, which limbs are affected, and whether symptoms occur with activity or at rest. The history should include all forms of tobacco, nicotine, cannabis, and other substance exposure.

During the examination, the clinician may check skin color and temperature, look for sores, and feel pulses in the arms and legs. Tests may compare blood pressure at different points in a limb. A normal ankle-to-arm blood pressure comparison does not always rule out Buerger's disease because the blockages may be limited to vessels in the hands, feet, fingers, or toes.

An ultrasound can show blood flow through arteries and veins. More detailed imaging may include CT angiography, MR angiography, or catheter angiography. Angiography creates pictures of the blood vessels after contrast material is given. Buerger's disease may produce segmental blockages and small, winding vessels that form alternate routes around an obstruction. These findings support the diagnosis but are not unique to this condition.

Blood tests are commonly used to look for other causes of reduced circulation, including:

A heart evaluation may be needed if there is concern that a clot traveled from the heart into a limb. Clinicians may also consider atherosclerosis, an injury, medication or drug effects, and other forms of vasculitis, meaning blood vessel inflammation.

Removing a tissue sample for examination, called a biopsy, is not routinely required. It may be considered when the diagnosis remains uncertain or the clinical pattern is unusual.

- Autoimmune diseases that inflame blood vessels
- Blood-clotting disorders
- Diabetes
- Abnormal blood cell counts
- Certain infections

Treatment and management

Complete tobacco cessation is the central treatment. It can prevent further attacks and greatly reduce the risk of amputation. Simply cutting down is not enough to reliably stop disease activity.

A cessation plan may include counseling, a structured quit program, support from family or peers, and non-nicotine prescription medicines when medically appropriate. Because nicotine may continue to narrow blood vessels, people with Buerger's disease should discuss nicotine patches, gum, lozenges, and vaping with their clinician before using them.

Avoiding secondhand tobacco smoke is also reasonable. Continued symptoms after quitting may prompt a careful review for hidden tobacco or nicotine exposure and for another possible diagnosis.

Daily limb care helps prevent minor injuries from becoming larger wounds. Helpful measures include keeping the hands and feet clean, checking the skin each day, wearing well-fitting shoes, and treating cuts promptly. Heating pads and hot water can burn numb skin, so affected limbs should be warmed gently. Cold exposure should be limited because it can tighten blood vessels.

Physical activity may support circulation and function, but the safest type depends on pain, wounds, and the severity of reduced blood flow. A vascular specialist or rehabilitation clinician can provide appropriate guidance.

Medicines may be used to manage pain, treat infection, improve blood flow, or reduce specific symptoms. An intravenous medicine called iloprost has shown benefits for rest pain and ulcer healing in some studies, but its availability and use vary. Evidence for many other medicines is

limited, and medication does not replace complete tobacco cessation.

Antibiotics like amoxicillin or doxycycline are used when a wound has a bacterial infection. They do not treat the underlying blood vessel inflammation. Routine blood-thinning treatment is not automatically helpful for every person with Buerger's disease; its use depends on the individual situation and whether another reason for it is present.

Procedures to restore blood flow may be difficult because Buerger's disease often blocks very small vessels. Bypass surgery or a catheter-based procedure may be considered when imaging shows a suitable target, but many people are not candidates.

Other procedures, such as interrupting certain nerves to reduce vessel tightening or using spinal cord stimulation for pain, are sometimes considered in specialist care. Their benefits are less certain.

If tissue is permanently damaged, severely infected, or causing uncontrolled pain, removal of a toe, finger, or larger part of a limb may be necessary. Early tobacco cessation and wound care are intended to prevent this outcome.

Complications

The main complications result from a prolonged lack of blood flow. They include chronic pain, limited walking or hand use, nonhealing ulcers, and repeated wound infections.

Gangrene can develop when tissue no longer receives enough oxygen to survive. Dead or infected tissue may require surgery. In advanced disease, amputation can become necessary.

Pain and reduced mobility can also affect sleep, work, independence, and emotional health. Rehabilitation, pain management, and mental health support may be useful parts of care.

Buerger's disease usually affects the limbs. Involvement of blood vessels supplying internal organs is uncommon but has been reported.

Follow up

Follow-up is usually coordinated with a vascular specialist. Visits may include an examination of pulses, skin temperature, color, wounds, pain, and walking or hand function. Blood-flow testing may be repeated if symptoms change.

Routine follow-up is important even after tobacco has been stopped. A clinician can monitor healing, support continued abstinence, adjust pain management, and address other factors that affect circulation.

Contact a healthcare professional promptly if a new sore develops, an existing wound becomes larger, or pain begins occurring at rest. New redness, warmth, swelling, drainage, or fever may indicate an infection and deserves same-day medical advice.

Seek emergency care for signs of a sudden, severe loss of blood flow, including:

Emergency assessment is also appropriate for confusion, fainting, severe shortness of breath, or chest pain. These symptoms are not typical routine features of Buerger's disease and may have another serious cause.

- Abrupt and intense limb pain
- A hand, foot, finger, or toe that suddenly becomes pale or cold
- New loss of feeling
- Sudden weakness or inability to move the affected area
- Rapidly spreading discoloration

Sources

- Olin JW. Thromboangiitis obliterans (Buerger's disease). The New England Journal of Medicine . 2000;343(12):864-869. doi:10.1056/NEJM200009213431207.
- Piazza G, Creager MA. Thromboangiitis obliterans. Circulation . 2010;121(16):1858-1861. doi:10.1161/CIRCULATIONAHA.109.871012.
- Rivera-Chavarría IJ, Brenes-Gutiérrez JD. Thromboangiitis obliterans (Buerger's disease). Annals of Medicine and Surgery . 2016;7:79-82. doi:10.1016/j.amsu.2016.03.028.
- Cacione DG, Baptista-Silva JCC, Macedo CR. Pharmacological treatment for Buerger's disease. Cochrane Database of Systematic Reviews . 2020;5:CD011033.
- Mayo Clinic. Buerger disease: Symptoms and causes; diagnosis and treatment. Mayo Foundation for Medical Education and Research.
- Centers for Disease Control and Prevention. How to quit smoking. National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.