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Cervical (Carotid or Vertebral) Artery Dissection

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What is cervical artery dissection?

There are four main arteries that supply blood flow to the brain. Two carotid arteries and two vertebral arteries. The carotid arteries can be felt on each side of the lower neck, immediately below the angle of the jaw. The vertebral arteries are located in the back of the neck near the spine and cannot be felt on physical exam.

The artery walls are made up of three layers of different types of tissue, each with a specific function. Dissection occurs when a tear in the artery wall allows blood to leak between the layers and separate them. The effect has been described as what happens to a piece of plywood that gets wet.

Cervical artery dissection is a dissection of any of the arteries in the neck. It can involve a carotid or vertebral artery and sometimes multiple arteries can be involved.

What causes cervical artery dissection?

Certain medical conditions such as Marfan or vascular Ehlers-Danlos syndromes (https://my.clevelandclinic.org/health/articles/marfan) – types of genetic connective tissue diseases – fibromuscular dysplasia (https://my.clevelandclinic.org/health/articles/fibromuscular-dysplasia) or atherosclerosis (https://my.clevelandclinic.org/health/articles/arterial-disease) (the accumulation of fatty plaque in the artery walls) put individuals at risk for developing cervical artery dissection. Cervical artery dissection in these patients is called "spontaneous," meaning that it occurs without trauma to the head or neck.

Cervical artery dissection also can occur in the general population as a result of blunt trauma injury to the neck, such as a high speed car accident or a fall, with chiropractic manipulation, or from hyperextension of the neck in sports or exercise. Cervical artery dissection has also been reported after heavy weight lifting.

High blood pressure (https://my.clevelandclinic.org/health/articles/hypertension-high-blood-pressure) and smoking (https://my.clevelandclinic.org/health/articles/smoking-heart-health) increase the risk of cervical artery dissection. Some cases of

cervical artery dissection also have been reported after invasive diagnostic procedures.

How does cervical artery dissection develop?

Cervical artery dissection begins as a tear in one layer of the artery wall. Blood leaks through this tear and spreads between the layers of the wall. As the blood collects in the area of the dissection, it forms a clot that limits blood flow through the artery. If the clot is large enough to completely block blood flow, this can result in a stroke (https://my.clevelandclinic.org/health/articles/stroke). Equally dangerous, pieces of the clot can break off and travel up through the bloodstream, limit the blood flow to the brain and cause a stroke.

Depending on where the dissection occurs in the artery, it may cause the artery to bulge in the area where the blood is pooling. This bulging, blood-filled area is called a pseudoaneurysm. If within the brain, these can be fragile and carry a risk of breaking and causing bleeding around the brain (called a subarachnoid hemorrhage); however if in the neck, these rarely break, though they may produce symptoms by pressing on surrounding structures. Sometimes pseudoaneurysms can form after the initial artery dissection.

Symptoms & Diagnosis

What are the symptoms of cervical artery dissection?

Sometimes a stroke is the first sign of cervical artery dissection and emergency treatment is required. More commonly, symptoms develop over a period of hours or days, even in patients who have traumatic injuries. Symptoms are general rather than specific and include headache (https://my.clevelandclinic.org/health/articles/overview-of-headaches-in-adults), neck and face pain (especially pain around the eyes), vision disturbances such as double vision or a droopy eyelid, a pulsatile "whooshing" sound in one of the ears, known as pulsatile tinnitus, or a sudden decrease in sense of taste and/or weakness on one side of the body.

Stroke can develop hours, days or even a week after these symptoms begin. This is the most serious risk of cervical artery dissection.

How is cervical artery dissection diagnosed?

When a patient comes to the doctor's office or the emergency room with any of the symptoms described above, the doctor may suspect cervical artery dissection. To accurately diagnose this condition, the doctor can choose from several different imaging technologies to see how well blood is flowing through the carotid and vertebral arteries and if there is a tear present.

Helical computed tomography angiography (CTA) is becoming the gold standard for use in patients with symptoms of cervical artery dissection. This is a noninvasive type of imaging that uses computed tomography (CT) (https://my.clevelandclinic.org/health/articles/computed-tomography-ct-scan) technology and a contrast dye to provide an accurate, three-dimensional picture of the arteries on a computer screen.

Magnetic resonance angiography (MRA) is another, very accurate, noninvasive imaging technique that can be used for diagnosing cervical artery dissection. MRA uses a magnetic field and radio waves to provide pictures of the carotid and vertebral arteries and can be performed without or with a special type of contrast material.

In addition to blood flow, these technologies can show changes in the dimension of the carotid and vertebral arteries, blood in the wall of the artery, whether or not there is a pseudoaneurysm, and changes to structures surrounding the blood vessel. CTA is especially useful because it can create cross-sectional images of the blood vessel that will show separation of the layers of the vessel wall that is characteristic of dissection. These studies can also assess the brain and determine if there has been damage to brain tissue as a result of the dissection.

Doppler ultrasonography (DUS) (https://my.clevelandclinic.org/health/articles/ultrasonography-test-transcranial-doppler) is gaining popularity as a useful tool in identifying cervical artery dissection. This technology is now widely available in the hospital setting. Doppler ultrasound can detect abnormal blood flow in a dissected carotid artery. DUS has the advantages of being fast, noninvasive and easy to use at the patient's bedside. In some situations, however, the dissection may be too high up in the neck or may not be well seen with ultrasound, such as for the vertebral arteries.

As these non-invasive imaging technologies have developed and improved, the use of conventional angiography (https://my.clevelandclinic.org/health/articles/angiography-test) for diagnosing cervical artery dissection has decreased.

Conventional angiography uses a contrast dye and X-ray to image the blood vessels. It may not beas accurate as the non-invasive imaging technologies, is invasive and has a 0.5 percent risk of complications, including a procedure-related stroke.

Treatment Options

How is cervical artery dissection treated?

In some cases, cervical artery dissection is not diagnosed until after a stroke has developed. In those patients, treating stroke to prevent lasting effects is the goal.

When a patient comes into the doctor's office or the emergency room with symptoms of cervical artery dissection without stroke, preventing stroke is the primary treatment goal. Appropriate treatment for an individual patient depends on whether the patient has an underlying disorder such as fibromuscular dysplasia (https://my.clevelandclinic.org/health/articles/fibromuscular-dysplasia) or vascular Ehlers-Danlos or Marfan syndrome or has experienced trauma, where and how the injury occurred and if the patient has other injuries or medical conditions.

First-line treatment for cervical artery dissection usually is antiplatelet agents (such as aspirin) or anti-coagulation to prevent the formation of blood clots. Antiplatelet drugs (https://my.clevelandclinic.org/health/articles/stroke) such as aspirin or clopidogrel may used alone or in combination. Alternatively, heparin given intravenously (through the vein) or an injectable (shot) form followed by warfarin (https://my.clevelandclinic.org/health/articles/anticoagulant-medication-warfarin-coumadin) can also be used. These medications prevent blood clot formation and thus can help protect against stroke. There is no definite

evidence yet that one class of drugs is better than the other for preventing clot formation in patients with carotid or vertebral artery dissection. They usually are prescribed for three to six months, but some patients may require longer treatment.

Those patients who are unable to take either anticoagulants or antiplatelet agents, or those who continue to have symptoms (such as vision disturbances or weakness) despite good blood thinners, or those who have very low blood flow to the brain due to dissection may need a procedure to try and correct the process of dissection. Normally, these are minimally invasive treatments that are performed through the blood vessels. Angioplasty (repairing the dissected section of artery with inflation of a special balloon) or placement of a stent (https://my.clevelandclinic.org/health/articles/carotid-stenting) (a mesh-like device that holds the artery open) are two endovascular procedures that are used to treat cervical artery dissections. They frequently are used together to provide the longest-lasting treatment. Cleveland Clinic interventional cardiologists, neurointerventionalists, and vascular surgeons perform over 200 endovascular procedures every year on patients with carotid artery disease.

What is the outlook following cervical artery dissection?

For spontaneous cervical artery dissection, the mortality is less than 5 percent. The risk for lasting neurological impairment from the disease is considerably higher. More than half of patients with spontaneous cervical artery dissection develop a stroke, sometimes delayed by hours or days. Even so, an estimated 75 percent of patients with spontaneous cervical artery dissection make a good recovery.

Following the first incidence of cervical artery dissection, patients have a 1 percent risk of recurrence per year over the next 10 years. Risk of recurrence is higher in the first few weeks after the initial event and in younger patients than older patients, but younger patients also respond better to treatment and have a better outlook. Some patients have reported persistent headache after cervical artery dissection, lasting years after the event.

People who have had cervical artery dissection should see a vascular or neurology specialist for a CTA, MRA or other imaging to assess the severity and extension of the dissection. This imaging is normally repeated several months later to have the dissection re-evaluated for either progression, resolution or stability of the injury.

Your doctor may recommend that you modify some of your activities, such as your exercise program, to avoid activities that may increase the risk of future events (such as heavy lifting). Patients who have had a cervical artery dissection may need to be checked for vascular disease in other parts of the body.

How can I prevent cervical artery dissection?

If you have an underlying disease that increases your risk of cervical artery dissection, such as fibromuscular dysplasia or vascular Ehlers-Danlos syndrome, it is important that you are under the care of a vascular specialist and follow your doctor's instructions. For other individuals, following the same steps that reduce your risk of heart disease – healthy eating (https://my.clevelandclinic.org/health/articles/heart-health-diet), blood pressure control, weight management (https://my.clevelandclinic.org/health/articles/weight-management-patient-education), exercise (https://my.clevelandclinic.org/health/articles/exercise-

basics) and smoking cessation (https://my.clevelandclinic.org/health/articles/quitting-smoking) – can reduce your risk of cervical artery dissection by improving the health of your blood vessels.

Doctors Who Treat

Patients with cervical artery dissection may be treated by neurologists, neurosurgeons, or vascular medicine or vascular surgical specialists, often in a multidisciplinary fashion.

Doctors vary in quality due to differences in training and experience; hospitals differ in the number of services available. The more complex your medical problem, the greater these differences in quality become and the more they matter.

Clearly, the doctor and hospital that you choose for complex, specialized medical care will have a direct impact on how well you do. To help you make this choice, please review our outcomes:

- Miller Family Heart and Vascular Institute Outcomes (https://my.clevelandclinic.org/services/heart/about-heart-vascular-institute/outcomes-and-stats).
- Neurological Institute Outcomes (https://my.clevelandclinic.org/departments/neurological/medical-professionals/publications)

Cleveland Clinic medical professionals work together to provide the best care to our patients. Choosing a doctor to treat your vascular disease depends on where you are in your diagnosis and treatment.

Heart and Vascular Institute:

Section of Vascular Medicine (https://my.clevelandclinic.org/services/heart/departments-centers/specialty-centers-and-clinics/vascular): for evaluation, medical management or interventional procedures to treat vascular disease. In addition, the Non-Invasive Laboratory (https://my.clevelandclinic.org/health/articles/testing-vascular-disease) includes state-of-the art computerized imaging equipment to assist in diagnosing vascular disease, without added discomfort to the patient. The specialists in our FMD (https://my.clevelandclinic.org/services/heart/disorders/fibromuscular-dysplasia) and SCAD Clinic (https://my.clevelandclinic.org/health/articles/spontaneous-coronary-artery-dissection) specialize in the treatment of patients with cervical artery dissection. Call Vascular Medicine Appointments, toll-free 800.223.2273, extension 44420 or request an appointment online.

Department of Vascular Surgery (https://my.clevelandclinic.org/services/heart/departments-centers/departments/vascular-surgery-department): surgery evaluation for surgical treatment of vascular disease, including aorta, peripheral artery, and venous disease. Call Vascular Surgery Appointments, toll-free 800.223-.2273, extension 44508 or request an appointment online (http://my.clevelandclinic.org/WebContact/WebAppointment).

Neurological Institute:

Cleveland Clinic's Cerebrovascular Center (https://my.clevelandclinic.org/departments/neurological/depts/cerebrovascular) offers a multidisciplinary team of specialists including neurologists, neurosurgeons, neuroradiologists, neurointensivists and rehabilitation specialists, who work together to provide expert diagnosis and medical, endovascular and surgical management (https://my.clevelandclinic.org/health/articles/surgical-endovascular-services) of cervical artery dissection and all other cerebrovascular conditions. To make an appointment for an evaluation in the Cerebrovascular Center please call toll-free 866.588.2264 or request an appointment online (http://my.clevelandclinic.org/WebContact/WebAppointment).

You may also use our MyConsult (http://my.clevelandclinic.org/online-services/myconsult) second opinion consultation using the Internet.

Resources & Patient Info

Contact

If you need more information,click here to contact us (https://my.clevelandclinic.org/departments/heart/appointments-locations), chat online with a nurse (http://my.clevelandclinic.org/departments/heart/appointments-locations#resource-nurse-tab) or call the Miller Family Heart and Vascular Institute Resource & Information Nurse at 216.445.9288 or toll-free at 866.289.6911. We would be happy to help you.

Becoming a Patient

- Make an appointment (https://my.clevelandclinic.org/departments/heart/appointments-locations)
- Plan Your Visit (https://my.clevelandclinic.org/patients/travel)
- Billing & Insurance (https://my.clevelandclinic.org/patients/billing-insurance)
- Visitor Amenities (https://my.clevelandclinic.org/patients/visitor-information)

Treatment Options

Additional information about vascular treatment options can be found at:

- Vascular Surgery Services (https://my.clevelandclinic.org/departments/heart/depts/vascular-surgery)
- Aorta Surgery (https://my.clevelandclinic.org/health/articles/aorta-surgery)
- Carotid Artery Disease Treatments (https://my.clevelandclinic.org/health/articles/carotid-artery-disease-treatments)
- Peripheral Artery Disease Treatments (https://my.clevelandclinic.org/health/articles/pad-treatments)
- Venous Disease Treatments (https://my.clevelandclinic.org/health/articles/venous-disease-treatments)
- IVC Filters for Blood Clot (https://my.clevelandclinic.org/health/articles/ivc-filter-retrieval)
- Visceral (Abdominal) Artery Disease Treatments (https://my.clevelandclinic.org/health/articles/intestinal-pad-visceral-artery-aneurysm-surgery)

Treatment Guides

- Aortic Aneurysm (http://pages.clevelandclinic.org/aortic-aneurysm-index.html)
- May Thurner Syndrome (http://pages.clevelandclinic.org/may-thurner-syndrome-index.html)
- Thoracic Outlet Syndrome (http://pages.clevelandclinic.org/thoracic-outlet-syndrome-index.html)
- Vein and Vascular (http://pages.clevelandclinic.org/veintreatment-index.html)
- All Miller Family Heart & Vascular Institute Treatment Guides (https://my.clevelandclinic.org/departments/heart/patient-education/treatment-guides)

Diagnostic Tests

Diagnostic tests are used to diagnose your abnormal heartbeat and the most effective treatment method.

- Diagnostic testing (https://my.clevelandclinic.org/departments/heart/diagnostics-testing)

Webchats

Our webchats and video chats give patients and visitors another opportunity to ask questions and interact with our physicians.

- Vascular Disease, Peripheral Arterial Disease & Thrombosis (https://my.clevelandclinic.org/departments/heart/patient-education/webchats/vascular-disease-pad) webchats and video chats
- All Miller Family Heart & Vascular Institute webchats (https://my.clevelandclinic.org/departments/heart/patient-education/webchats)

View a calendar of events (http://chat.clevelandclinic.org/) and register (http://chat.clevelandclinic.org/) for future chats. Check the calendar for topics that interest you!

Videos

- Vascular Disease and Treatments Videos (https://my.clevelandclinic.org/departments/heart/patient-education/videos/vascular-disease-treatments-videos)
- All Miller Family Heart & Vascular Institute Videos (https://my.clevelandclinic.org/departments/heart/patient-education/videos)

Interactive Tools

- Miller Family Heart & Vascular Institute Interactive Tools (https://my.clevelandclinic.org/departments/heart/patient-education/interactive-tools)

Resource Links

- Recovery at home (https://my.clevelandclinic.org/departments/heart/patient-education/recovery-care)

- Support Groups and Information (https://my.clevelandclinic.org/departments/heart/patient-education/support-groups)
- Visit Health Essentials (http://health.clevelandclinic.org/topics/health-a-z/health-vascular-health/vascular-pad/) - Read articles on vascular disorders and healthy living on Health Essentials
- Follow Heart & Vascular Institute webchats and news stories on Twitter (http://twitter.com/ClevClinicHeart)
- Subscribe to Heart and Vascular eNews (http://www.clevelandclinic.org/lp/hvi-enews-signup/index.html)
- American Stroke Association (http://www.strokeassociation.org/STROKEORG/) *
- American Heart Association (http://www.heart.org/HEARTORG/) *
- Vascular Cures (http://vascularcures.org/index.php)*
- VascularWeb (http://www.vascularweb.org/Pages/default.aspx) - Resources for Vascular Disease and Treatment*

**A new browser window will open with this link.*

The inclusion of links to other websites does not imply any endorsement of the material on those websites nor any association with their operators.

Surgical Outcomes

Why choose Cleveland Clinic for your care?

Our outcomes (https://my.clevelandclinic.org/departments/heart/about/outcomes-stats) speak for themselves. Please review our facts and figures and if you have any questions don't hesitate to ask.

- Download Heart & Vascular Outcomes (https://my.clevelandclinic.org/-/scassets/files/org/outcomes/2015/outcomes-hvi.ashx?la=en)

This information is provided by the Cleveland Clinic and is not intended to replace the medical advice of your doctor or healthcare provider. Please consult your healthcare provider for advice about a specific medical condition.