

Chapter 1 : CAD: Bifurcation Blockage | Cleveland Clinic

Carotid surgery is only advised when the FLOW rate (in mm/sec) is increased (indicating a narrowing of the artery). Describing the bifurcation in millimeters is of little relevance. An internal or external carotid artery of mm diameter, however, is INCREDIBLY small.

Print Carotid Artery Disease Diagnosis Imaging procedures are often used to diagnose carotid artery disease. In these tests, the radiologist primarily wants to determine what is going on at the carotid bifurcation where the carotid arteries divide in the neck. Imaging modalities visualize flowing blood differently. In x-ray, it is not visible at all. In CT scan, the slightly increased density within large arterial structures e. Ultrasound to Diagnose Carotid Artery Disease The carotid arteries are small and focused and are located close to the skin. In some cases, the bifurcation is located at the angle of the jaw and be almost impossible to image, but in most cases it is perfectly accessible. Plaque that is narrowing the artery is especially visible if it is new and uncalcified, but as the clot grows, it begins to degenerate. More often than not, parts of the clot begin to harden and calcify i. In ultrasound, however, sound waves often bounce right back when they hit these hard calcium deposits. Such calcified plaque often makes it quite difficult to see the bifurcation well enough for diagnostic purposes. With ultrasound you can almost "see" flowing blood. Large veins look as dark as water in a dark basinâ€”slowly flowing blood, no turmoil, no turbulence. The walls contract and relax in a slow rhythm. It is completely different in the arteries, through which the blood is pumped at high speeds. For diagnostic purposes the radiologist must first determine if there is a narrowing, and then determine just how much narrowing is present. This is where the Doppler ultrasound comes in. The radiologist directs a fine sound wave toward the carotid bifurcation, aimed right in the middle of the vessel where the red blood cells are flowing. Flowing cells cause a change in what the receiver sees in the reflected beam. The machine analyzes the difference and calculates the velocity of the flowing blood. The Doppler signal, also, gives information about the degree of turbulence in the flowing blood, which is a distinctive sign of significant narrowing or stenosis. Now we are able to direct finely focused sound waves into a vessel and determine how fast the red cells are moving during the entire cardiac cycle. Stenosis is measured by measuring the velocity of red cells going into the bifurcation and the velocity of red cells coming out, just like radar traps can sample the speeds of the cars coming by. So now we have a test that shows us what is going on with the bifurcation and shows the percent of stenosis with good reliability. However, ultrasound is very dependent on the experience of the technologist and patients with very poor heart strength experience slow blood flow and are therefore not good ultrasound subjects. In borderline situations, more information is needed for diagnosis. In magnetic resonance imaging MRI , the arteries appear as flow void, which present as black holes on cross sectional scans. If the plane of the image is redirected from cross-sectional to say frontal down the front , all these black holes would line up into a black tube. Using various electronic tools to sharpen the image, the radiologist produces a magnetic resonance angiogram MRA. The radiologist waits for the dye to circulate, then gets multiple images when the dye is most concentrated in the carotids. The computer takes the data and reconstructs it into a frontal or side plane so that the vessels are visible. As with MRA, the pictures are often quite good. With both modalities, radiologists often prefer to study the myriad of cross-sectional images than count too heavily on a computer generated "reconstruction. In some cases, the catheter is advanced into the main artery in the chestâ€”the aorta. This test is called thoracic aortogram. The dye fills in the various parts of the thoracic aorta, as well as all its branches, among which are the two carotid arteries. Usually the one on the left comes off the aorta directly, the one on the right usually comes from the innominate artery that arises from the aorta. Digital subtraction is a special technique to take away bone and other confusing shadows so the dye in the vessels is even more visible. In other circumstances, the catheters are inserted directly into the carotid arteries. Carotid arteriography does increase the risk to the patient. Carotid arteriography is a very safe test with complication rates under 1 percent in most medical facilities. However, even when performed by an experienced radiologist with experienced technologists, it carries some significant risk.

Chapter 2 : Carotid Artery Disease | National Heart, Lung, and Blood Institute (NHLBI)

Carotid artery disease occurs because of damage to the inner lining of the artery. This is a gradual process that is associated with smoking, high blood pressure, high cholesterol levels, and poorly controlled diabetes.

Structure[edit] The carotid sinus is the reflex area of the carotid artery, consisting of various nerve receptors for baroregulation pressure regulation of the body in sync to external conditions. This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. February Learn how and when to remove this template message The carotid sinus contains numerous baroreceptors which function as a "sampling area" for many homeostatic mechanisms for maintaining blood pressure. The carotid sinus baroreceptors are innervated by the sinus nerve of Hering, which is a branch of cranial nerve IX glossopharyngeal nerve. The glossopharyngeal nerve synapses in the nucleus tractus solitarii NTS located in the medulla oblongata of the brainstem. The NTS indirectly modulates the activity of sympathetic and parasympathetic vagal neurons in the medulla and pons through the hypothalamus. These neurons then regulate the autonomic control of the heart and blood vessels. Clinical significance[edit] It is a sensitive site of the body because stimulation can drive large-scale reflex effects throughout the body. This can be used therapeutically in treatment of resistant hypertension [2] by baroreflex activation. Physical assault at this point, producing massive baroreflex activation can cause dramatic falls in blood pressure and cerebral ischemia. This classically presents as a patient who has "fainted" actually a presyncope on several occasions while shaving, or in some other way coming into contact with their carotid sinus. Carotid sinus syndrome is a temporary loss of consciousness that sometimes accompanies convulsive seizures because of the intensity of the carotid sinus reflex when pressure builds in one or both carotid sinuses. A pacemaker-like device can be implanted to electrically stimulate the receptors chronically, which is found to lower blood pressure by mmHg. Czermak-Hering test Massage of the carotid sinus, carotid sinus massage is used to diagnose carotid sinus syncope and is sometimes useful for differentiating supraventricular tachycardia SVT from ventricular tachycardia. Like the valsalva maneuver , it is a therapy for SVT. Carotid sinus reflex death has been pointed out as a possible cause of death in cases of strangulation , hanging and autoerotic strangulation , but such deductions remain controversial. However, medical literature is replete with studies examining the use of carotid sinus massage as a diagnostic and therapeutic examination tool. In studies of thousands of uses on elderly patients, there were no complications of death or bradycardic events requiring treatment or resuscitation, even though this age group is more likely to be symptomatic from carotid sinus stimulation. This could lead to any number of life-threatening effects, including stroke.

Carotid stenosis (carotid artery disease) Overview. Carotid stenosis is a narrowing of the carotid arteries, the two major arteries that carry oxygen-rich blood from the heart to the brain.

Carotid Artery Disease What Is Carotid artery disease is a disease in which a waxy substance called plaque builds up inside the carotid arteries. You have two common carotid arteries, one on each side of your neck. They each divide into internal and external carotid arteries. The internal carotid arteries supply oxygen-rich blood to your brain. The external carotid arteries supply oxygen-rich blood to your face, scalp, and neck. Carotid Arteries Figure A shows the location of the right carotid artery in the head and neck. Figure B shows the inside of a normal carotid artery that has normal blood flow. Figure C show the inside of a carotid artery that has plaque buildup and reduced blood flow. If blood flow is cut off for more than a few minutes, the cells in your brain start to die. This impairs the parts of the body that the brain cells control. A stroke can cause lasting brain damage; long-term disability, such as vision or speech problems or paralysis an inability to move ; or death. Overview Carotid artery disease is a major cause of stroke in the United States. Over time, plaque hardens and narrows the arteries. This may limit the flow of oxygen-rich blood to your organs and other parts of your body. Atherosclerosis can affect any artery in the body. For example, if plaque builds up in the coronary heart arteries, a heart attack can occur. If plaque builds up in the carotid arteries, a stroke can occur. A stroke also can occur if blood clots form in the carotid arteries. This can happen if the plaque in an artery cracks or ruptures. Blood cell fragments called platelets PLATE-lets stick to the site of the injury and may clump together to form blood clots. Blood clots can partly or fully block a carotid artery. A piece of plaque or a blood clot also can break away from the wall of the carotid artery. This can block blood flow in the artery and cause a stroke. Carotid artery disease may not cause signs or symptoms until the carotid arteries are severely narrowed or blocked. For some people, a stroke is the first sign of the disease. Outlook Carotid artery disease is a major cause of stroke in the United States. Other conditions, such as certain heart problems and bleeding in the brain, also can cause strokes. Lifestyle changes, medicines, and medical procedures can help prevent or treat carotid artery disease and may reduce the risk of stroke. Call 9â€”1â€”1 right away if you have symptoms of a stroke. Do not drive yourself to the hospital. You have the best chance for full recovery if treatment to open a blocked artery is given within 4 hours of symptom onset. The sooner treatment occurs, the better your chances of recovery. Causes Carotid artery disease seems to start when damage occurs to the inner layers of the carotid arteries. Major factors that contribute to damage include: Smoking High blood pressure High levels of sugar in the blood due to insulin resistance or diabetes When damage occurs, your body starts a healing process. The healing may cause plaque to build up where the arteries are damaged. The plaque in an artery can crack or rupture. If this happens, blood cell fragments called platelets will stick to the site of the injury and may clump together to form blood clots. The buildup of plaque or blood clots can severely narrow or block the carotid arteries. This limits the flow of oxygen-rich blood to your brain, which can cause a stroke. Risk Factors The major risk factors for carotid artery disease, listed below, also are the major risk factors for coronary heart disease also called coronary artery disease and peripheral artery disease. Family history of atherosclerosis. People who have a family history of atherosclerosis are more likely to develop carotid artery disease. High blood pressure Hypertension. The mmHg is millimeters of mercuryâ€”the units used to measure blood pressure. Lack of physical activity. Too much sitting sedentary lifestyle and a lack of aerobic activity can worsen other risk factors for carotid artery disease, such as unhealthy blood cholesterol levels, high blood pressure, diabetes, and overweight or obesity. Metabolic syndrome is the name for a group of risk factors that raise your risk for stroke and other health problems, such as diabetes and heart disease. The five metabolic risk factors are a large waistline abdominal obesity , a high triglyceride level a type of fat found in the blood , a low HDL cholesterol level, high blood pressure, and high blood sugar. Metabolic syndrome is diagnosed if you have at least three of these metabolic risk factors. As you age, your risk for atherosclerosis increases. The process of atherosclerosis begins in youth and typically progresses over many decades before diseases develop. Smoking can damage and tighten blood vessels, lead to unhealthy cholesterol levels, and raise blood

pressure. Unhealthy blood cholesterol levels. An unhealthy diet can raise your risk for carotid artery disease. Foods that are high in saturated and trans fats, cholesterol, sodium, and sugar can worsen other risk factors for carotid artery disease. However, if you know that you have one or more risk factors, you can take steps to help prevent or delay the disease. If you have plaque buildup in your carotid arteries, you also may have plaque buildup in other arteries. Screening and Prevention Taking action to control your risk factors can help prevent or delay carotid artery disease and stroke. Your risk for carotid artery disease increases with the number of risk factors you have. Following heart-healthy eating is an important part of a healthy lifestyle. Aiming for a Healthy Weight. Be as physically active as you can. Physical activity can improve your fitness level and your health. Ask your doctor what types and amounts of activity are safe for you. Read more about Physical Activity and Your Heart. If you smoke, quit. Talk with your doctor about programs and products that can help you quit. Other steps that can prevent or delay carotid artery disease include knowing your family history of carotid artery disease. If you or someone in your family has carotid artery disease, be sure to tell your doctor. Take all of your medicines as your doctor advises. Signs, Symptoms, and Complications Carotid artery disease may not cause signs or symptoms until it severely narrows or blocks a carotid artery. Bruit During a physical exam, your doctor may listen to your carotid arteries with a stethoscope. He or she may hear a whooshing sound called a bruit. This sound may suggest changed or reduced blood flow due to plaque buildup. To find out more, your doctor may recommend tests. Not all people who have carotid artery disease have bruits. During a mini-stroke, you may have some or all of the symptoms of a stroke. However, the symptoms usually go away on their own within 24 hours. Stroke and mini-stroke symptoms may include: A sudden, severe headache with no known cause Dizziness or loss of balance Inability to move one or more of your limbs Sudden trouble seeing in one or both eyes Sudden weakness or numbness in the face or limbs, often on just one side of the body Trouble speaking or understanding speech Even if the symptoms stop quickly, call 911 for emergency help. Getting medical care can help find possible causes of a mini-stroke and help you manage risk factors. These actions might prevent a future stroke. A stroke may occur days, weeks, or even months after a mini-stroke. Stroke The symptoms of a stroke are the same as those of a mini-stroke, but the results are not. Most people who have strokes have not previously had warning mini-strokes. Getting treatment for a stroke right away is very important. Call 911 for emergency help as soon as symptoms occur. Make those close to you aware of stroke symptoms and the need for urgent action. Learning the signs and symptoms of a stroke will allow you to help yourself or someone close to you lower the risk of brain damage or death due to a stroke. Diagnosis Your doctor will diagnose carotid artery disease based on your medical history, a physical exam, and test results. Medical History Your doctor will find out whether you have any of the major risk factors for carotid artery disease. Physical Exam To check your carotid arteries, your doctor will listen to them with a stethoscope. He or she will listen for a whooshing sound called a bruit. This sound may indicate changed or reduced blood flow due to plaque buildup. Diagnostic Tests The following tests are common for diagnosing carotid artery disease. If you have symptoms of a mini-stroke or stroke, your doctor may use other tests as well. Carotid Ultrasound Carotid ultrasound also called sonography is the most common test for diagnosing carotid artery disease. This test can show whether plaque has narrowed your carotid arteries and how narrow they are.

Chapter 4 : Carotid Bifurcation | United Biologics

Carotid artery disease is also called carotid artery stenosis. The term refers to the narrowing of the carotid artery. Carotid artery narrowing is usually caused by the buildup of fatty substances and.

Carotid artery The carotid arteries are a pair of blood vessels located on both sides of your neck that deliver blood to your brain and head. Carotid artery disease occurs when fatty deposits (plaques) clog the blood vessels that deliver blood to your brain and head. The blockage increases your risk of stroke, a medical emergency that occurs when the blood supply to the brain is interrupted or seriously reduced. Stroke deprives your brain of oxygen. Within minutes, brain cells begin to die. Stroke is the most common cause of death and the leading cause of permanent disability in the U.S. Carotid artery disease develops slowly. The first sign that you have the condition may be a stroke or transient ischemic attack (TIA). A TIA is a temporary shortage of blood flow to your brain. Treatment of carotid artery disease usually involves a combination of lifestyle changes, medication and sometimes surgery. Signs and symptoms of a stroke or TIA include: Sudden numbness or weakness in the face or limbs, often on only one side of the body; Sudden trouble speaking and understanding; Sudden trouble seeing in one or both eyes; Sudden dizziness or loss of balance; Sudden, severe headache with no known cause. When to see a doctor: Seek emergency care if you experience any signs or symptoms of stroke. Even if they last only a short while and then you feel normal, see a doctor right away. Talk to your doctor if you have risk factors for carotid artery disease. Seeing a doctor early increases your chances that carotid artery disease will be found and treated before a disabling stroke occurs. Request an Appointment at Mayo Clinic Causes Carotid artery disease is caused by a buildup of plaques in arteries that deliver blood to your brain. Plaques are clumps of cholesterol, calcium, fibrous tissue and other cellular debris that gather at microscopic injury sites within the artery. This process is called atherosclerosis. Carotid arteries that are clogged with plaques are stiff and narrow. Clogged carotid arteries have trouble delivering oxygen and nutrients to vital brain structures that are responsible for your day-to-day functioning. Risk factors Factors that increase your risk of carotid artery disease include: Excess pressure on artery walls can weaken them and make them more vulnerable to damage. Nicotine can irritate the inner lining of your arteries. Smoking also increases your heart rate and blood pressure. Diabetes lowers your ability to process fats efficiently, placing you at greater risk of high blood pressure and atherosclerosis. High levels of low-density lipoprotein cholesterol and high levels of triglycerides, a blood fat, encourage the accumulation of plaques. Your risk of carotid artery disease is higher if a relative has atherosclerosis or coronary artery disease. Arteries become less flexible and more prone to injury with age. Excess weight increases your chances of high blood pressure, atherosclerosis and diabetes. Spells of stopping breathing at night may increase your risk of stroke. It contributes to conditions that damage your arteries, including high blood pressure, diabetes and obesity. Complications Ischemic stroke Ischemic stroke occurs when a blood clot blocks or plugs an artery leading to the brain. A blood clot often forms in arteries damaged by the buildup of plaques (atherosclerosis). It can occur in the carotid artery of the neck as well as other arteries. Carotid artery disease causes about 10 to 20 percent of strokes. A stroke is a medical emergency that can leave you with permanent brain damage and muscle weakness. In severe cases, a stroke can be fatal. Carotid artery disease can lead to stroke through: A carotid artery may become so narrowed by atherosclerosis that not enough blood is able to reach portions of your brain. A piece of a plaque may break off and flow to smaller arteries in your brain. The plaque fragment may get stuck in one of these smaller arteries, creating a blockage that cuts off blood supply to part of your brain. Some plaques are prone to cracking and forming irregular surfaces on the artery wall. Your body reacts as if to an injury and sends blood cells that help the clotting process to the area. The result can be a large clot that blocks or slows blood flow to the brain, causing a stroke. Prevention To prevent or slow the progression of carotid artery disease, consider these suggestions: Maintain a healthy weight. Being overweight contributes to other risk factors, such as high blood pressure, cardiovascular disease, diabetes and sleep apnea. Limit cholesterol and fat. Cutting back on saturated fat, in particular, may reduce the buildup of plaques in your arteries. Eat a variety of fruits and vegetables. They contain nutrients such as potassium, folate

and antioxidants, which may protect against a TIA or stroke. Excess salt sodium may increase blood pressure in people who are sensitive to sodium. Experts recommend that healthy adults eat less than 1, milligrams of sodium a day. Exercise can lower your blood pressure, increase your level of high-density lipoprotein HDL cholesterol – the "good" cholesterol – and improve the overall health of your blood vessels and heart. It also helps you lose weight, control diabetes and reduce stress.

Chapter 5 : Carotid sinus - Wikipedia

â€¢ We evaluated duplex ultrasonographic velocity patterns from the common carotid artery in patients with arteriographically verified internal carotid artery disease.

Carotid stenosis carotid artery disease Overview Carotid stenosis is a narrowing of the carotid arteries, the two major arteries that carry oxygen-rich blood from the heart to the brain. Also called carotid artery disease, carotid stenosis is caused by a buildup of plaque atherosclerosis inside the artery wall that reduces blood flow to the brain. Treatment aims to reduce the risk of stroke by controlling or removing plaque buildup and preventing blood clots. Blood supply of the brain To understand carotid stenosis, it is helpful to understand the circulatory system of the head and neck see Anatomy of the Brain. The carotid artery begins at the aorta in the chest as the common carotid and courses up through the neck to the head. Place your hands on either side of your neck, and you can feel your pulse in your carotid arteries. Near the larynx, the common carotid divides into the external and internal carotid arteries. The external carotid arteries supply blood to the face and scalp. The internal carotid arteries supply blood to the brain. The most common location of atherosclerotic plaque buildup is the carotid bifurcation Fig. The common carotid artery divides into the internal and external carotid arteries. The bifurcation green circle is the most common site of plaque buildup. What is carotid stenosis? Carotid stenosis is a progressive narrowing of the carotid arteries in a process called atherosclerosis. Normal healthy arteries are flexible and have smooth inner walls. As we age, hypertension and small injuries to the blood vessel wall can allow plaque to build up. Plaque is a sticky substance made of fat, cholesterol, calcium, and other fibrous material. Over time, plaque deposits inside the inner wall of the artery can form a large mass that narrows the lumen, the inside diameter of the artery. Atherosclerosis also causes arteries to become rigid, a process often referred to as "hardening of the arteries. Atherosclerotic plaque narrows the artery diameter, reducing blood flow. The irregular surface of the artery wall can cause clot formation that blocks the vessel or breaks off, travels downstream, and blocks a smaller vessel. There are three ways in which carotid stenosis increases the risk of stroke: Plaque deposits can grow larger and larger, severely narrowing the artery and reducing blood flow to the brain. Plaque can eventually completely block occlude the artery Fig. Plaque deposits can roughen and deform the artery wall, causing blood clots to form and blocking blood flow to the brain Fig. Plaque deposits can rupture and break away, traveling downstream to lodge in a smaller artery and block blood flow to the brain. What are the symptoms? Most people with carotid stenosis have no symptoms until the artery becomes severely narrowed or a clot forms. Symptoms are most likely to first appear with a mini-stroke, also known as a transient ischemic attack TIA. TIAs result when blood flow to the brain is temporarily interrupted and then restored. The symptoms typically last a couple of minutes and then resolve completely, and the person returns to normal. TIAs should not be ignored; they are a warning that an ischemic stroke and permanent brain injury may be looming. Symptoms of a TIA or an ischemic stroke can include weakness or numbness in an arm or leg, difficulty speaking, a drooping face, vision problems, or paralysis affecting one side of the body. If you or a loved one develops these symptoms, you should call immediately. What are the causes? Atherosclerosis is the major cause of carotid artery disease. It can begin in early adulthood, but it usually takes decades to cause symptoms. Some people have rapidly progressing atherosclerosis during their thirties, others during their fifties or sixties. Atherosclerosis begins with damage to the inner wall of the artery caused by high blood pressure, diabetes, smoking, and high cholesterol â€”specifically "bad" cholesterol or low-density lipoprotein LDL. Other risk factors include obesity, coronary artery disease, a family history of carotid stenosis, and advanced age. Less commonly, carotid aneurysm and fibromuscular dysplasia can cause carotid stenosis. People who have heart disease have an increased risk of developing carotid stenosis. Typically, the carotid arteries become diseased a few years later than the coronary arteries. Older people are more likely to be affected by carotid stenosis. Before age 75, men are more at risk than women. A person who has high cholesterol, has high blood pressure, and smokes is eight times more likely to develop atherosclerosis than a person without these risk factors. How is a diagnosis made? Your doctor will learn as much as possible about your symptoms, current and previous medical problems, current

medications, and family history. He or she will perform a physical exam. The doctor may listen to the carotid artery with a stethoscope to detect a swishing noise called a "bruit. One or more diagnostic tests are performed to detect narrowing of the carotid arteries. Carotid stenosis is diagnosed by either a doppler ultrasound of the neck, a CT angiogram CTA of the neck, magnetic resonance angiography MRA , or a cerebral angiogram. Imaging also can reveal evidence of multiple small strokes. Doctors can make a diagnosis of carotid stenosis if tests show diminished blood flow in one or both carotid arteries. You may be referred to a neurosurgeon for a surgical consultation. Doppler ultrasound of the carotid artery showing a narrowed artery lumen. Doppler ultrasound is a noninvasive test that uses reflected sound waves to evaluate blood flow through a vessel Fig. The ultrasound probe is placed on the neck over the carotid arteries. This test will reveal how much blood is flowing through the artery and to what degree the artery has narrowed i. Computed Tomography Angiography , or a CT angiogram, is a noninvasive X-ray that provides detailed images of anatomical structures within the brain. It involves injecting a contrast agent into the blood stream so that arteries of the brain can be seen. This type of test provides the best pictures of both blood vessels through angiography and soft tissues through CT. It enables doctors to see the narrowed artery and to determine how much it has narrowed. Contrast dye is injected through an IV to illuminate blood vessels in the neck. Cerebral Angiogram is a minimally invasive test that uses X-rays and a contrast agent injected into the arteries through a catheter in the groin. It enables doctors to visualize all arteries in the brain Fig. Angiogram of the carotid artery showing a narrowing of the vessel caused by atherosclerotic plaque red arrow. What treatments are available? The goal of treatment is to reduce the risk of stroke. Treatment options vary according to the severity of the arterial narrowing and whether you are experiencing stroke-like symptoms or not. People who have a medical condition that would increase the risk of surgery also are likely to be treated with medication. Antiplatelet medications aspirin, ticlopidine, clopidogrel thin the blood and prevent clotting in the narrowed arteries, which allows blood to pass through more easily. Cholesterol-lowering statins help reduce plaque formation in atherosclerosis. Antihypertensive medications diuretics, ACE inhibitors, angiotensin blockers, beta blockers, calcium channel blockers, etc. Because high blood pressure is a major risk of stroke, regular blood pressure screenings are recommended. Surgery Surgical treatment is generally recommended for patients who have suffered one or more TIAs or strokes and who have a moderate to high grade of carotid stenosis [2,3]. The aim of surgery is to prevent stroke by removing or reducing the plaque buildup and enlarging the artery lumen to allow more blood flow to the brain. Carotid endarterectomy is an open surgery to remove the plaque. A skin incision is made in the neck and the carotid artery is located. Temporary clamps are placed across the artery above and below the area of stenosis to stop blood flow. During this time, the carotid artery on the other side of the neck carries blood flow to the brain. The surgeon makes an incision in the artery over the blocked area. The plaque buildup is peeled out and removed Fig. The artery is then closed with tiny sutures and the clamps removed to allow blood flow to the brain. A carotid endarterectomy is a surgery to remove plaque from the area of the carotid artery where the internal and external carotid arteries branch. It is performed during an angiogram in a radiology suite. A flexible catheter is inserted in the femoral artery in the groin. It is guided through the blood stream past the heart, and into the carotid artery. Next, a small catheter with an inflatable balloon at the tip is positioned across the plaque Fig. The balloon is opened to dilate the artery and compress the plaque against the artery wall. The balloon is then deflated and removed. Finally, a self-expanding mesh-like tube called a stent is placed over the plaque, holding open the artery. During angioplasty, a balloon-tipped catheter is placed within the narrowed vessel. The balloon is inflated compressing the plaque and opening the artery. The balloon is removed and a self-expanding mesh stent is placed over the plaque to hold open the artery. The stent remains in the artery permanently. Carotid artery bypass is a surgery that reroutes the blood supply around the plaque-blocked area. A length of artery or vein is harvested from somewhere else in the body, usually the saphenous vein in the leg or the ulnar or radial arteries in the arm. The vessel graft is connected above and below the blockage so that blood flow is rerouted bypassed through the graft.

Chapter 6 : Carotid Artery Screening

Carotid artery disease is a disease in which a waxy substance called plaque builds up inside the carotid arteries of the neck. Learn more about causes, risk factors, screening and prevention, signs and symptoms, diagnoses, and treatments for carotid artery disease, and how to participate in clinical trials.

Abstract Carotid artery revascularization has shown better outcomes for carotid artery disease management when compared to medical therapy alone, particularly for symptomatic patients. However, we still debate whether revascularization is beneficial for asymptomatic patients in the setting of contemporary medical therapy. Earlier trials showed favorable outcomes for CEA versus CAS, but more recent data with contemporary devices and more operator experience suggest equivalent outcomes. Whether symptomatic or asymptomatic, a patient-centered approach should consider medical management, CAS and CEA as complementary to each other. Medical therapy only was previously found inferior to CEA for symptomatic and asymptomatic patients. However, the benefit of carotid revascularization in asymptomatic patients is being revisited in this era of improved medical therapy [3]. Of note, these trials have systematically excluded patients with higher risk profiles, which on subsequent assessments revealed mortality rates about three times greater with CEA than reported [10]. CAS is now considered a viable alternative to CEA, and this article intends to focus and review the evolution of CAS as a treatment option for extra-cranial carotid artery disease, and the future of this therapy. Risk Profile and Percutaneous Revascularization 4. High Risk High risk features for CEA is based on various factors considered in randomized trials and it comprises of many clinical and anatomic variables. Studies of high-risk patients have grouped symptomatic and asymptomatic patients together and the trial eligibility was based on exclusion criteria from prior CEA trials. These adverse event rates were lower than prior registries study populations ranged from approximately to of carotid stenting with distal EPDs, suggesting CAS a safe and effective option among high risk surgical patients []. Standard Risk The role of CAS in standard-risk patients is yet to be conclusively determined, and the evidence base has limitations. There was no statistically significant difference in the primary outcome up to 4 and 10 years after carotid revascularization [22,23]. During the periprocedural period, though the incidence of the primary end point was similar with carotid- artery stenting and CEA 5. The rate of post procedural ipsilateral stroke also did not differ between groups [23]. Class I, Level of Evidence: Class IIb, Level of Evidence: CAS patients will be on dual antiplatelet therapy for 1-month post-procedure. The primary endpoint is the proportion of patients who experienced any stroke or death within 44 days of randomization or ipsilateral ischemic stroke thereafter up to 4 years [26]. This trial is expected to be completed in , and it may dictate the future treatment strategy for asymptomatic patients with carotid disease. Due to reimbursement restrictions, not only is there a growing lag in innovation for CAS the only update in recent years is trans carotid stenting , but also compromise of operator experience. Nonetheless, there are few recent developments to overcome the challenges with CAS, most notably being trans carotid stenting and proximal embolic protection devices. Catheter manipulation of the aortic arch in patients at high risk for traditional CEA adds to the risk of stroke among CAS patients. This procedure provides protection against embolization by avoiding endovascular manipulation within the aortic arch via surgical CCA access and also by providing flow reversal in advance of any manipulation of the lesion and throughout the stenting procedure. By hierarchical analysis, the all-stroke rate in the pivotal group was 1. In addition to flow reversal it facilitates management by operators less comfortable with navigating arch and using embolic protection devices. Proximal embolic protection devices provide another tool to prevent embolization while undergoing CAS. In 14 European centers, patients were enrolled in a prospective registry. Protected carotid stenting was performed with the Mo. MA device, prospective registry, enrolled subjects from September to February The day major adverse cardiac and cerebrovascular events rate was 2. No symptomatic patient suffered a stroke during this trial [29]. One may also need to move beyond using symptomatic status and percent carotid stenosis as the sole determinants of need for revascularization. Finally, CAS, CEA, and medical therapy should be considered as complementary therapeutic modalities for the treatment of patients with carotid disease.

Chapter 7 : update on percutaneous management of carotid bifurcation disease

Carotid artery disease occurs when fatty deposits (plaques) clog the blood vessels that deliver blood to your brain and head (carotid arteries). The blockage increases your risk of stroke, a medical emergency that occurs when the blood supply to the brain is interrupted or seriously reduced.

However, the thickness of the innermost layers of the carotid artery walls is an independent marker for atherosclerosis. According to the Society for Vascular Medicine and the American Society for Echocardiography ASE , the use of carotid IMT US is most useful for refining the risk for cardiovascular disease in patients who are at intermediate risk for developing the disease. According to the ASE, the test may also be considered for individuals: You should consult with your doctor to determine which screening tests for carotid artery disease are appropriate for you. For most ultrasound exams, you will be positioned lying face-up on an examination table that can be tilted or moved. Patients may be turned to either side to improve the quality of the images. A clear water-based gel is applied to the area of the body being studied to help the transducer make secure contact with the body and eliminate air pockets between the transducer and the skin that can block the sound waves from passing into your body. The sonographer ultrasound technologist or radiologist then places the transducer on the skin in various locations, sweeping over the area of interest or angling the sound beam from a different location to better see an area of concern. When the examination is complete, you may be asked to dress and wait while the ultrasound images are reviewed. What are the benefits and risks of carotid screening? Carotid Ultrasound Most ultrasound scanning is noninvasive no needles or injections. Occasionally, an ultrasound exam may be temporarily uncomfortable, but it should not be painful. Ultrasound is widely available, easy-to-use and less expensive than other imaging methods. Ultrasound imaging is extremely safe and does not use any ionizing radiation. Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images. Ultrasound may allow early detection of and intervention for cardiovascular disease. If a carotid ultrasound exam shows narrowing of one or both carotid arteries, treatment can be taken to restore the free flow of blood to the brain. Many strokes are prevented as a result. Risks For standard diagnostic ultrasound , there are no known harmful effects on humans. In nearly 50 years of experience, carotid ultrasound has proved to be a risk-free procedure. False positive results can occur. The ultrasound test may produce results suggesting blockages when there are none. Carotid IMT US is dependent on both the expertise of the sonographer and the resolution of the ultrasound machine being used. If your carotid artery screening reveals that you have narrowing of the carotid arteries, hence are at risk of a stroke or other cardiovascular issue, your doctor may recommend one of the following therapies, depending on the severity of blockage in your arteries. Treatments for carotid artery disease may include medication to reduce cholesterol levels and high blood pressure, lifestyle changes including healthy diet, exercise, and no smoking and interventional procedures such as angioplasty and stenting or surgical procedures such as carotid endarterectomy to restore adequate blood flow to the brain. In angioplasty and vascular stenting, a balloon catheter is inserted to open the artery and a metal mesh tube called a stent is placed at the site of the blockage to keep the artery open. In carotid endarterectomy, plaque buildup is surgically removed. For more information, see the Angioplasty and Vascular Stenting procedure page. Where can I find more information about carotid artery screening? You can find more information on carotid artery screening at:

Chapter 8 : Carotid artery disease - Symptoms and causes - Mayo Clinic

Common carotid artery intima-media It has been shown that approximately 80% of strokes are ischemic and due to atherosclerotic disease in the carotid bifurcation.

Chapter 9 : Diagnosis of Carotid Artery Disease - Carotid Artery Disease - blog.quintoapp.com

Carotid artery stenosis is a narrowing or constriction of any part of the carotid arteries, usually caused by

atherosclerosis.