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Heart To Heart Talk

with Philip S. Chua, M.D.

Carotid Arteries and Stroke

What are Carotid Arteries?

Carotid Arteries are blood vessels (one on each side of the neck) that transport blood from the heart to the brain. When you put your fingers on one side of your neck by the jaw and feel a beating, thumping or pulsatile sensation, that is the carotid artery.

How large are the Carotid Arteries?

The Carotid Artery, on average, is about 8 to 10 millimeters in diameter (about the size of the little finger of an average adult). It is about 4 to 5 inches in length outside of the skull (from the collar bone to the base of the jaw below the ear).

What veins are the counterpart of the Carotid Arteries?

Arteries have 'partner" veins. In the case of the Carotid Arteries, the counterpart veins are the Jugular Veins, one on each side of the neck. The Carotid Arteries bring blood from the heart to the brain, the Jugular Veins transport "used" blood from the brain back to the lungs for oxygenation and to the heart for recirculation.

Do the Carotid Arteries get blocked also?

Yes, the Carotid Arteries, like any arteries in the body, are not immune to hardening (arteriosclerosis) of the arteries. Hardening of the Carotid Arteries could lead to blockage of artery, eventually leading to a stroke. This condition is one of the most common causes of stroke in the world.

How do hardening of the arteries develop?

There are various risk factors, like smoking, high blood pressure, lack of physical exercise, overweight condition, eating high cholesterol diet (red meats, like pork and beef), stress and anxiety, hereditary, diabetes, and not knowing how to relax. These risk factors lead to a hypercoagulable state (thickening of the blood), making the person very prone to blood clot formation. As the thickened blood passes through the arteries, it "paints" or "coats" the inner tubing wall of the arteries. If the blood is thickened, one

could imagine how this "coats" the inner wall. As years go by, this constant "painting or coating" of the wall builds up, making the caliber or diameter of the artery smaller and tighter, leading to blockage in the circulation to the part of the body involved. In the case of the Carotid Artery, the brain suffers, leading to a stroke.

What happens next?

The hardening of the arteries starts with the abnormally thick blood coating the inner wall of the arteries as blood circulates through them. The thickened blood "painted" against the wall builds up, and gradually transforms to jelly-like consistency, becomes harder, then becomes like a scar, and eventually becomes as hard as our teeth or bones (calcification). This is evolution of arteriosclerosis, which is actually a more complex process.

How does blockage of the Carotid Arteries cause stroke?

Like blockages in any other arteries, obstruction in the Carotid Arteries cuts off or severely reduces the blood that goes to that part of the brain. The brain is very sensitive to lack of oxygen (which is being carried by blood) and when the amount of blood to the brain is significantly reduced (usually when the artery is blocked more than 50%), oxygen deficit occurs (called cerebral ischemia) and stroke develops.

How can one detect blockage of the Carotid Arteries?

A physical examination by a physician who listens to the Carotid Artery (in the neck) with a stethoscope will reveal an abnormal hissing sound (carotid bruit), which denotes reduction in the caliber of the artery and blood is going through a tight portion of the artery. It is like pinching a hose while air or water is going through it, a similar high-pitched hissing sound is heard.

When Carotid bruit is heard, what is the next test needed?

A Doppler Ultrasound of the Carotid Arteries, a non-invasive and painless test, can detect, with about 80% to 90% accuracy, if a significant blockage is present in the Carotid Artery. If there is any doubt, a Carotid Angiogram is performed.

What test confirms the presence or absence of blockages in the artery?

The final test, the "Supreme Court" if you will among all these tests, is the Angiogram or Arteriogram. It is a dye test that will give the final verdict as to the presence or absence of a blockage, its location, the degree of obstruction, the extent of the blockage, and if other arteries are involved. Dye is injected into the Carotid Artery

through a tiny "spaghetti" catheter that is passed into the groin artery and advanced into the upper chest segment of the main artery (Aorta), where the Carotid Arteries attached to, and dye is injected. This is followed by a rapid multiple, serial, X-ray filming, recording the flow of the dye inside the artery. This test is safe and most helpful in making the diagnosis and the choice of treatment.

If I suspect I could have this condition, what do I do?

Obviously, you need to see your physician, who will take your history and examine you. He will then prescribe whatever tests he decides you need. If he suspects a Carotid Artery blockage, he might order a Doppler Ultrasound of the Carotid Arteries, and/or a Carotid Arteriogram depending on his findings, realizing that if you have a significant blockage in you Carotid Arteries, you would need the blockages removed by surgery (called Carotid Endarterectomy) to prevent a stroke. Stroke is largely preventable.

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Our readers are invited to send their medical question for possible inclusion in future issues of this column. Mail your questions to Heart To Heart Talk c/o Cebu Cardiovascular Center, Cebu Doctors' Hospital, Osmena Boulevard, Cebu City, Philippines, or email it to heart@chua.net

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