Cancer Survivorship
Patient Education on Post-Treatment Care

Radiation-Induced Carotid Artery Stenosis

by John Werning, MD, DMD

What is it?
The carotid arteries are the main arteries in your neck that supply blood to your brain. The carotid artery can become narrowed by the accumulation of a substance called plaque, a disease process known as atherosclerosis. Narrowing of the carotid artery is known as carotid artery stenosis. Radiation treatments to the neck can increase the thickness of the wall of the carotid artery and accelerate atherosclerosis of the carotid artery, resulting in radiation-induced carotid artery stenosis. Insufficient blood flow to the brain, resulting from carotid artery stenosis, can result in a transient ischemic attack or a stroke. A transient ischemic attack, or TIA, occurs when the blood flowing to an area of the brain stops for a brief period of time. A stroke is a "brain attack" resulting from loss of blood supply to a region of the brain, which frequently results in permanent disability such as weakness or paralysis of an arm or leg, loss of ability to speak, and/or impairment of memory or thought processes.

How common is it among head and neck cancer patients?
Carotid artery stenosis occurs more frequently in those patients who are treated with radiation therapy. Approximately 3 out of 10 individuals who receive radiation therapy are diagnosed with carotid artery stenosis, and one of them will have a high-grade stenosis that decreases blood flow by at least 70%. The likelihood of a TIA or stroke after radiation therapy is approximately 10% in patients less than 60 years of age, whereas the risk of TIA or stroke is greater than 30% in individuals older than 75.

What are the signs/symptoms?
Radiation-induced carotid artery stenosis can first start affecting survivors many years after the completion of treatment. The progression of the narrowing can also slowly develop over the course of several years until signs and symptoms become present. The signs and symptoms of a TIA are similar to a stroke and are a serious warning sign that you may be at risk of a stroke.

Remember the **F-A-S-T** warning signs and symptoms:
F: Face Drooping-Is the smile uneven or is one side of the face numb?
A: Arm Weakness-Is one arm weak when both arms are raised or is one arm numb?
S: Slurred Speech-Is the individual difficult to understand or unable to speak?
T: Time to call 9-1-1

How is it diagnosed?
Carotid artery stenosis is diagnosed by performance of a non-invasive carotid artery duplex scan which uses two different types of ultrasound. This test provides an accurate assessment of the extent of atherosclerosis and thickening of the wall of the carotid artery, and will also quantify the blood flow through the carotid arteries to your brain. These test results can be used to predict your risk of a future TIA or stroke.

How is it treated?
Treatment for carotid artery stenosis is usually not necessary unless there is high-grade stenosis that decreases blood flow by at least 70%. When treatment is required, there are two main approaches: minimally invasive carotid artery stenting and carotid endarterectomy, which is a surgical procedure. Several factors must be considered by your physician to determine which treatment option is preferred.

Cancer Survivorship
Patient Education on Post-Treatment Care

When should I call my doctor?

Contact your doctor to obtain a baseline carotid artery duplex scan which will provide valuable information about the presence and extent of carotid artery stenosis, and will help you and your doctor to determine the need for follow up testing and treatment. Call 9-1-1 if you develop any of signs or symptoms of a stroke.

Where can I learn more?

https://www.strokeassociation.org/en/about-stroke/stroke-symptoms

https://www.brainandlife.org/disorders-a-z/disorders/app/detail/stroke

https://www.strokeassociation.org/en/about-stroke

https://www.mayoclinic.org/tests-procedures/carotid-angioplasty-and-stenting/about/pac-20385111