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Thoracic Aortic Aneurysms Backgrounder

Endovascular Innovations

Thoracic Aortic Aneurysms

The aorta is the largest artery in the body. It's the primary vessel that carries oxygen-rich blood from the heart to the rest of the body. The section of the aorta that runs through the chest is the thoracic aorta. If this segment of the aorta weakens, the vessel wall may expand or bulge with the high force of the blood pumped through it by the heart. The dangerous result of weakness and bulging in this arterial segment is called a thoracic aortic aneurysm (TAA).

Causes and Consequences

TAA's often result from hardening of the arteries (atherosclerosis), high blood pressure (hypertension) or birth defects (congenital disorders such as Marfan's syndrome). An increasingly common condition affecting the aorta, TAA's can be long and narrow (fusiform) or balloon-like and more contained (saccular). Other conditions affecting the aorta include penetrating ulcers and tears (dissections) in the aortic wall. The eventual outcome of an untreated TAA is typically rupture, an emergency situation in which the artery bursts, causing extensive internal bleeding that usually leads to death.

Prevalence and Comparisons

In the United States, approximately 10 out of every 100,000 older people have a TAA, and data suggest the prevalence is increasing steadily. While an estimated 60,000 Americans may have a TAA, only about half are ever diagnosed, due to the lack of symptoms. In total, upwards of 47,000 people in the United States die each year from all types of aortic disease. That's more than from breast cancer, AIDS, homicides or motor vehicle accidents.ⁱⁱ

Risk Factors

While aortic aneurysms are widely thought to primarily affect men, studies show that women are nearly as likely as men to have a TAA. People who smoke (or smoked) or are overweight, as well as those with high blood pressure, cholesterol and a family history of cardiovascular disease, are at greatest risk for TAA's.

Diagnosis

Early diagnosis of a TAA is critical, but discovering the condition often happens coincidentally due to the lack of obvious signs or symptoms. Since most TAA's are asymptomatic at the time of discovery, they are usually found incidentally on chest

X-rays or other imaging studies conducted for another reason. Diagnoses of TAAs are most commonly confirmed through computed tomography (CT) scans. The larger the TAA, or the faster it grows, the more likely it is to rupture. The risk of rupture increases when the aneurysm is larger than about twice the normal diameter of a healthy aorta.

Treatment

The traditional, open surgical approach for treating TAAs is done through an incision made in the side between the ribs. This procedure removes the diseased portion of the aorta and replaces it with a graft, a synthetic material put in place to restore uninterrupted blood flow through the aorta and all branch vessels. However, the close proximity of the thoracic aorta to the heart and the high pressure of blood flowing through it can make surgery extremely risky. As a result, physicians have begun using an alternative technique known as endovascular aortic repair (EVAR), a minimally invasive procedure.

In contrast to open surgery, EVAR involves a keyhole procedure in which a stent graft - a tube of woven polyester reinforced with a wire skeleton - is compressed on a delivery catheter, allowing it to be threaded through an artery in the groin and expanded at the site of the aneurysm. Once in place, the stent graft creates a new path for blood flow, reducing pressure on the aneurysm and the risk of rupture.

References:

i"Thoracic Aortic Aneurysms," St. Luke's - Roosevelt. 4 Oct. 2010
<<http://www.slrcsurgery.com/Thoracic%20aortic%20aneurysms.htm>>

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<http://my.clevelandclinic.org/heart/disorders/aorta_marfan/aorticaneurysm.aspx>

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