Transcatheter Aortic Valve Replacement

A common cause of heart disease is buildup of calcium in the aorta that causes narrowing and stiffness of the aortic heart valve (aortic stenosis). Transcatheter aortic valve replacement (TAVR) is a procedure to replace the aortic heart valve by going through an individual's larger blood vessels (for example, arteries located in the groin or neck or under the clavicle). It is an alternative for people that might do poorly if they have open heart surgery.

When planning for TAVR, precise measurements of the dimensions of the person's aorta, at the location of the heart valve, are important for picking the right size and shape of the artificial valve. Measurements of the aorta and connected arteries are also important to figure out if blood vessels are big enough for the artificial valve to go through and to select the path with lowest risk. CT angiography (CTA) (https://www.radiologyinfo.org/en/info/angioct) with intravenous contrast is recommended to show blood vessels of the chest, abdomen, and pelvis. CTA data reduce the chance of complications with the procedure.

CTA without contrast is not good enough for planning TAVR. In people with CT contrast allergy, ultrasound (echocardiography) of the heart can measure the size of the aorta but is not good enough for planning the TAVR. For these individuals, MR angiography (MRA) (https://www.radiologyinfo.org/en/info/angiomr) with contrast is a better alternative. MRA is limited in showing the amount of calcium and cannot be used in people with some implants, claustrophobia, or irregular heart rhythms.

— By Søren Meibom, PhD, and Bruno Policeni, MD, MBA. This information originally appeared in the Journal of the American College of Radiology.

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