A Value-based Approach to Aortic Surveillance

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Editorial

Aortic surveillance is performed for many purposes, both before and after surgery, for screening as well as for follow-up after intervention. Prior to intervention, surveillance maybe performed for aneurysms, stenosis, arteritis, or dissection. Post-operatively surveillance is used to monitor branch patency, valve function, stability of dissections, aneurysm growth, or recurrence of stenosis. Numerous pathologies of the aorta are followed by imaging modalities such duplex ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), conventional angiography, or transesophageal echocardiography. These imaging tests potentially involve ionizing radiation, strong magnetic fields, iodinated contrast, invasive procedures, high costs, and recurring time commitments. Furthermore, surveillance can lead to false-positive findings, potentially subjecting patients to even more testing or invasive procedures. While surveillance of the aorta is often necessary, it is far from benign.

Cost is a major reason that aortic surveillance has received attention from both payers and healthcare agencies. Numerous guidelines exist with recommendations for the frequency and preferred imaging modality for various aortic pathologies. There is always a balance between surveillance and the cost and risks of the surveillance. Guidelines attempt to balance these competing forces and often use additional criteria to justify increased surveillance for certain subgroups at higher risk. But, guidelines may not take into account the concept of value. Value in healthcare is the quality achieved per cost. While cost-efficiency focuses on outcome per cost, value incorporates quality metrics and analyzes from a broader and deeper perspective. A value-based approach to aortic surveillance should be applied alongside surveillance guidelines.

Infrarenal abdominal aortic aneurysms (AAA) are the most common aortic pathology for which surveillance is performed. There are guidelines regarding screening for aneurysms, surveillance of known aneurysms, and post-surgical surveillance [1,2]. There is some general consensus between the guidelines of the various vascular societies, but these guidelines still may not be consistent with the concept of value. Not only does value take into account costs, but it also factors in the quality of outcome. The goal of screening for and treating AAA is to prevent death from a preventable cause. But are our methods of doing so maximizing the value equation?

It is difficult to perform a value-based analysis of screening and surveillance for AAA without first recognizing the discrepancies between population-based and individualized medicine. Screening and surveillance recommendations are based on populations. We understand that a population has a certain prevalence of AAA and certain subgroups of the population are at higher risk. We formulate screening recommendations accordingly. But when we apply a population-based screening system to the individual, we sacrifice the quality of care to that individual. Certainly, if we screened annually every member of the population starting at age 30 for AAA, we would discover more aneurysms and likely prevent death from ruptured AAA. We would also be performing an extraordinary number of screenings with negative results. The value delivered by such a system would be low. This is impractical for a population, but for a physician seeking to do everything possible to prevent one specific patient from dying of a ruptured AAA, it would be effective. The quality of care for that patient would be excellent but the cost would be unjustifiably high. Screening programs will miss AAA in patients believed to be at low risk for aneurysms. In all likelihood some patients will die of undiscovered AAA that go on to rupture, even if they live in a population that is screened in complete compliance with screening guidelines, simply because the guidelines are not designed for outliers. For such unfortunate patients, the value delivered by the healthcare system would be quite low.

Guidelines are designed for populations but they have to be adapted for individual patients. A value-based analysis can help guide care when a patient falls outside of the guidelines. Factors to consider when treating a patient differently than guidelines suggest include the patient's age and comorbidities, her functional status, her work or retirement situation, her quality of life, and her willingness to undergo intervention based on positive tests. Such factors might affect the plans for

surveillance or threshold for treatment. And, a value-based analysis does not always lead to increased surveillance or a lower threshold for treatment. A patient who would be unlikely to agree to surgery may not need frequent or any surveillance, even for a known aortic pathology.

Abdominal aortic aneurysms are only one pathology with guidelines for screening or treatment that should be reevaluated from a value-based perspective. Other pathologies with such guidelines are thoracic aortic aneurysms [3,4] aortic dissections [5,6] coarctation [7,8] thoracoabdominal aneurysms [9], and aortoiliac occlusive disease [10]. No guidelines mentioned here are faulty in their data or recommendations, but these guidelines are not produced with value-based medicine in mind. Value is a relatively new concept to healthcare but one that is receiving increased attention. The focus on value is only likely to increase with time as populations age and health care costs rise. Governments, payers, and patients are all likely to expect increased value for each healthcare dollar spent. Those of us at the forefront of cardiovascular care are well-suited to answer the call for higher-value healthcare. Surveillance for various aortic pathologies is a wise place to start.

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