Assessing the role of cognition prior to transcatheter aortic valve replacement

Veerawat Phongtankuel, MC Reid, and Eugenia L Siegler
Division of Geriatrics and Palliative Medicine, Weill Cornell Medical College, New York, NY, USA

Abstract
Transcatheter aortic valve replacement offers patients with severe aortic stenosis an opportunity to live longer and better lives. Although this procedure allows clinicians to treat sicker and frailer patients who cannot undergo open heart surgery, age-related comorbidities, specifically cognitive impairment, must factor into the evaluation process.

Keywords
Aortic stenosis; cognitive impairment; dementia; geriatrics; outcomes; transcatheter aortic valve replacement

Case
A 93-year-old man with a history of severe aortic stenosis, coronary artery disease, hypertension, and cognitive impairment presents to the hospital for a transcatheter aortic valve replacement (TAVR), as recommended by his cardiologist. His wife has been anxious to try any modality that might reverse his functional decline. The patient is a poor historian, and she provides a list of her concerns which include generalized weakness, dyspnea on exertion, nausea, and sweats. After reviewing the patient’s medical records, it was noted that he had been hospitalized three times over the past 6 months for these complaints.

A transthoracic echo reveals an aortic valve mean gradient of 60 mmHg, aortic valve area of 0.63 cm², and ejection fraction of 61%. A left heart catheterization shows severe left circumflex disease but no change compared to one performed 5 years ago. As a member of the cardiac team, the geriatrician evaluates the patient and is asked to assess the patient’s dementia given concerns expressed by the interventional cardiologist and cardiac nurses.
The patient is pleasant and can engage in simple conversations with the geriatrician consultant. Further questioning reveals a lack of understanding as to why he has been hospitalized. He states that his heart is “fine.” The geriatrician notices the patient’s inability to unwrap a muffin before eating it and has to remove the wrapper so the patient can eat it. No acute findings are seen on brain imaging, and there is no evidence of delirium or depression.

The patient’s wife, who is his health care agent, reports noticing a progressive decline in his cognition starting at the age of 80 years. He currently requires 24-h care, is dependent in all of his instrumental activities of daily living (IADLs), and needs assistance with several basic activities of daily living (ADLs). The patient scores 11 out of 30 on a Montreal Cognitive Assessment (MOCA) test (http://www.mocatest.org), consistent with severe dementia.

In light of the patient’s functional and cognitive limitations from his severe dementia, and the uncertainty that his physical symptoms are due to aortic stenosis, the cardiology team and geriatrician consultant concur that TAVR is not appropriate in this patient. A family meeting held with the patient’s wife and children leads to a plan that includes close follow-up with his cardiologist and increased services to assist with his dementia care.

Discussion

Up to a third of individuals aged 85 years and older have dementia, and as the oldest old constitute a growing population undergoing TAVR, geriatricians frequently play an integral role as part of the cardiac team in evaluating these patients for the procedure. Dementia is a terminal illness; the median survival of patients with dementia ranges from 3.7 to 7.6 years. This patient had a history of a slow and progressive memory loss resulting in marked ADL and IADL deficits and required around-the-clock supervision.

Many patients with cognitive impairment will not exhibit such clear-cut deficits. Despite the greater prevalence of cognitive disorders in the elderly, physicians have difficulty identifying patients with mild cognitive impairment and mild dementia. In these cases, the utilization of a cognitive test such as the Mini-Cog or the MOCA can help to tease out cognitive impairment from other associated causes. Obtaining collateral information from family, friends, and doctors is often a key component in establishing a diagnosis.

A key issue in patients with any degree of cognitive impairment is competency and informed consent. Our patient lacked the ability to provide informed consent. He was unable to understand the disease, treatment options, and risks and benefits of the procedure. Cognitive testing should include an assessment of formal decision-making capacity. In this case, the decision to pursue TAVR treatment was appropriately left to the patient’s surrogate, but she lacked a clear understanding of his prognosis and the impact of his dementia on prospects for meaningful improvement.

Cognitive impairment is associated with increased mortality and post-operative complications. Arnold et al found that cognitive impairment is an important risk factor in predicting poor outcomes in TAVR patients, but these patients did not have significant impairment. Although it is reasonable to infer that severe dementia will have an even greater
negative impact on TAVR outcome, studies examining outcomes or quality of life in TAVR patients with moderate-to-severe dementia are lacking.

Even in the absence of clear data about the role of dementia in TAVR outcomes, the TAVR evaluation process must include conversations with patients and families about realistic outcomes, potential complications, and goals of care. Such conversations should occur before the TAVR workup is initiated, whenever possible. Given their expertise in functional and cognitive impairment, geriatricians can help determine whether potential invasive interventions are warranted and will yield meaningful benefit.

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