Selection for Ventricular Restoration: A Caution

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SNOWMASS, COLO. — Many cardiothoracic surgeons are not exercising due care in selecting patients for surgical ventricular restoration—and the result is a disturbingly high operative mortality, Dr. Andrew S. Wechsler said at a conference sponsored by the Society for Cardiovascular Angiography and Interventions.

Surgical ventricular restoration (SVR) entails reshaping the failing, distorted, spherical left ventricle into a normal elliptical shape by excluding noncontractile scar tissue and inserting a synthetic patch.

A worldwide experience totaling thousands of patients shows that when SVR is applied to the correct population with advanced ischemic cardiomyopathy, it results in excellent restoration of ventricular function with an operative mortality of 3%-6% and a 5-year survival in excess of 80%.

That is particularly impressive in a population of heart failure patients with otherwise dim prospects because they are failing medical therapy and realistically have only a tiny chance of receiving a heart transplant, said Dr. Wechsler, who is professor and chair of cardiothoracic surgery at Hahnemann University Hospital, Philadelphia.

But a different set of outcomes was noted in a recent series comprising about 800 patients in a Society of Thoracic Surgeons registry who underwent SVR.

In a manuscript that Dr. Wechsler had culled from the STS database, the operative mortality in a very contemporary series was 13%. "I was incredibly concerned about this completely out-of-place high operative mortality voluntarily reported by the surgeons doing these operations," commented Dr. Wechsler, who is editor of the Journal of Thoracic and Cardiovascular Surgery.

In going over these "rather sobering" data in search of an explanation, he found that one factor jumped out: poor patient selection. Nearly 40% of patients had SVR within a few days following a large MI. Most operative deaths occurred in this subgroup.

"I can't stress enough that this operation is designed for the chronically remodeled ventricle and not as a treatment for profound heart failure shortly after an MI; those patients shouldn't be referred for this operation. I think that we've done a bad job of getting this message out, when we find so many patients in that series fell into this very, very adverse category," he continued.

Experience has shown that the best candidates for SVR have akinesia or dyskinesia over the anterior ventricle, viable myocardium over much of the high basilar part of the anterior ventricle, and an end-systolic volume index of 90 mL/m^2 or less. The ideal candidate also has a pulmonary artery pressure of less than 40 mm Hg, Q waves on the anterior ECG leads, demonstrable remote myocardial viability on magnetic resonance imaging or dobutamine echocardiography, and no mitral regurgitation.

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"As you move away from the ideal patient, operative mortality increases and the efficacy of the operation decreases substantially," the surgeon cautioned.

Until recently, surgeons thought the ideal SVR candidate had isolated left anterior descending coronary artery disease. But this conviction predated current improved methods of myocardial protection and technical operative advances. In 2005, surgeons at Johns Hopkins University reported the successful extension of SVR to a population of patients with advanced heart failure and evidence of multiterritory infarction—and with an acceptably low operative mortality.

Surgeons who do surgical ventricular restoration place much less emphasis on preoperative left ventricular ejection fraction than on careful determination of ventricular volume and shape.

A strong candidate for SVR might have an ejection fraction of 17%-18%, often climbing to 38%-40% postoperatively, which is sufficient gain to remove the indication for an implantable cardioverter defibrillator. ■