Commentary: Concomitant valve surgery during left ventricular assist device implantation is risk free: Is God in the details or is it the devil?

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Central Message

Concomitant valve surgery at the time of LVAD implantation can be performed safely without increasing early or mid-term mortality.

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In this issue of the *Journal*, Sugiura and colleagues¹ evaluate the effectiveness of concomitant valve surgery in patients undergoing durable left ventricular assist device (LVAD) implantation. A total of 91 of 526 patients underwent tricuspid, aortic, or mitral valve intervention during implantation of HeartMate II (Thoratec Corporation, Pleasanton, Calif) or HeartWare (HeartWare International Inc, Framingham, Mass) devices. The authors found that early and mid-term survival were similar between patients undergoing isolated LVAD and those undergoing concomitant valve procedures at the time of LVAD. In multivariate analysis, concomitant valve surgery was not associated with mortality. Exploratory analysis showed significantly superior survival at 1 year in the subgroup of patients who underwent mitral valve repair or replacement compared with LVAD alone. The authors conclude that concomitant valvular surgery is safe in this setting with good early to mid-term results.

In the absence of randomized controlled studies, there is ongoing controversy in the management of concomitant valvular disease at the time of LVAD insertion. The authors attempt to tackle the extremely relevant question of how to manage patients with valvular pathology undergoing LVAD, from a center of excellence with vast expertise in mechanical assist devices. The authors' results encourage those surgeons who think that significant valvular pathology should be addressed at the time of LVAD implant, especially those who routinely address mitral valve lesions to presumably enhance transplantability² and improve late right ventricular function.³ Unfortunately, many questions are left unanswered. Although cardiac transplantation rates were similar among LVAD alone and LVAD + valve surgery groups, patients undergoing LVAD implantation as destination therapy were not separated from those undergoing LVAD as bridge to transplantation. The decision to perform a concomitant valvular procedure is certainly

different in a 45-year-old woman with favorable blood type who will likely eventually be listed for transplant, compared with a 67-year-old man with multiple comorbidities who is undergoing LVAD as destination therapy. A recent large study using the Interagency Registry for Mechanically Assisted Circulatory Support database suggested that mitral valve intervention in the former may not influence survival but may confer a benefit in the latter.⁴ Another limitation in the study by Sugiura and colleagues¹ is the "lumping together" of the valvular cases, which increases power but severely weakens generalizability. For instance, most surgeons would intervene on severe aortic regurgitation at the time of LVAD, whereas a sizeable proportion of surgeons never intervene on the mitral valve for severe mitral regurgitation (MR). In addition, it would be extremely interesting to report on the fate of the valves left untouched in the LVAD only group, especially those with greater than moderate MR, because a substantial proportion of these patients will have improved MR with LVAD alone. Echocardiographic data at follow-up are notably absent from this article and constitutes a significant limitation.

It is clear that valve surgery at the time of LVAD comes at a cost. There was a 5-fold increase in the risk of stroke, and right ventricular dysfunction was nearly doubled in the concomitant valve group compared with LVAD alone, although right ventricular assist device use and 30-day

mortality were equivalent. In one of the largest studies that evaluated the impact of concomitant valve surgery in patients with an LVAD,⁵ clamping the aorta during LVAD insertion was associated with right heart dysfunction and increased mortality, whereas interventions not requiring aortic clamping such as tricuspid valve repair and some mitral interventions did not translate in increased perioperative risk. Unfortunately, the study by Sugiura and colleagues¹ was not designed to shed further light onto this concept.

The authors should be congratulated for their excellent results in this challenging group of patients. To what extent these are due to better patient selection acquired through years of experience versus the actual treatment evaluated (ie, concomitant valve surgery) remains debatable.

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