A new attachment

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For small children with profound heart failure and a dilated left ventricle, the current standard of care is to initiate durable mechanical circulatory support with a size-appropriate left ventricular assist device (VAD), employing left ventricular apical cannulation for inflow to the VAD. However, for patients whose heart failure occurs in the setting of a normal-sized left ventricle (ie, restrictive cardiomyopathy) or a small left ventricular cavity (ie, hypertrophic cardiomyopathy), the apical cannula may become obstructed by either ventricular septal or free wall myocardium or by the mitral valve apparatus. A pre-emptive approach to this problem, employing left atrial cannulation with cannulas specifically designed for this approach (EXCOR; Berlin Heart, The Woodlands, Tex) may be effective, although atrial cannulation has generally been believed to be less effective than apical cannulation.¹ Alternatively, resection of the native mitral apparatus with mitral valve replacement and modified apical cannula insertion has recently been reported.² In adult patients, aggressive myectomy without mitral valve replacement has also been successful.^{3,4} To this list of options, Ma and colleagues⁵ have added another ingenious approach, achieving left atrial drainage (ie, pump inflow) by a trans-right atrial, transeptal connection whereby a vascular graft is anastomosed to an atrial septostomy and attached to a standard VAD cannula.

Ma and colleagues⁵ provide sound rationale for their technique and their excellent clinical outcome provides support for the concept. That said, the authors do not discuss whether they considered the simpler approach of simply securing an atrial cannula in the atrial septostomy, which would avoid the need for a graft anastomosis to the septum and securing that graft to a cannula. The authors describe a potential objection to the use of the cannula alone: The thrombogenic potential of the cannula in the left atrium.⁶ However, such a concern would also be valid for any intracavitary cannula, such as is standard for left ventricle apical cannulation.

Several other potential considerations related to this novel technique are worth mentioning. The transatrial/

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Central Message

Transseptal left atrial cannulation is a novel and potentially valuable approach for patients with restrictive or hypertrophic cardiomyopathy.

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septal approach would certainly complicate the placement of a right VAD, should such an appliance be believed to be necessary, although it was not needed in this case. The need for right-sided support may in fact be higher in patients with hypertrophic or restrictive cardiomyopathy, and indeed was believed to be a particular Achilles heel of atrial cannulation.¹ In addition, although the authors did not discuss the concern, it would not be surprising if the outer surface of the graft sewn to the atrial septum was thrombogenic in the right atrial cavity. On the plus side, a potential advantage not mentioned by the authors of this transeptal approach is the relative ease of decannulation and reconstruction in the event of recovery of left ventricle function. An additional benefit of the transeptal approach is the avoidance of a tedious and potentially difficult dissection and mobilization of the ventricular apex, which may be of particular benefit in a patient who has undergone 1 or several prior operations. Finally, it is likely that a septal attachment, either directly or as the authors have described, will be much more rapidly achievable and easily accomplished than standard apical attachment.

Ma and colleagues⁵ have presented an intriguing option for patients in whom apical cannulation is either undesirable or prohibitively difficult, an option that may be of value to cardiothoracic surgeons working with both adult and pediatric populations.

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