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Commentary: When to go "all in"

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CENTRAL MESSAGE

High-risk univentricular congenital heart disease patients are sometimes best served by upfront commitment to transplant and bridging with a ventricular assist device rather than staged palliation.

Cardiac surgery is a specialty of "big" decisions. Bleiweis and colleagues[1] report their algorithms for the surgical management of neonates and infants with failing univentricular congenital heart disease, their surgical technique for "hybrid" palliation with ventricular assist device (VAD) implantation, and results from their institutional experience thereof.

The algorithm and surgical techniques highlighted—while comprehensive and an interesting contribution to the literature—are not wholly novel, nor is the concept of bridging to transplant with VAD complex univentricular patients. The real contribution for which the authors should be applauded is their discussion of early commitment to VAD implantation and listing for transplant in the most challenging, high-risk patients. These are the patients with whom we are all familiar and recognize to be high-risk for single-ventricle palliations: the patient with hypoplastic left heart syndrome and severe tricuspid regurgitation, those with ventricular dysfunction from birth, and those with large coronary fistulae with signs of ischemia.

Instead of first attempting high-risk palliation with the plan of "bailing out" to VAD and transplantation if this fails, the authors commit directly to VAD/transplantation. This strategy prevents intervening surgeries that may result in possible extracorporeal membrane oxygenation runs and/or cardiac arrest, which can significantly impact the patient's future success on VAD and ability to make it to transplant in a good clinical state. The chance of survival in those with a "salvage" compared with a "planned" VAD is substantial. When weighing options, it is important to remember that the survival post-transplant of patients who are bridged with a VAD or not are the same, and that infants actually have the best median survival of any age group—24.5 years.[2] Although the authors report high mortality in those treated with hybrid palliation and VAD (7/15 patients, 6 of whom died on the waiting list), a convincing argument is made that sometimes this mortality rate is favorable to pursuing staged palliation against odds of success. Our group, among others, has highlighted "the reality of limping to pediatric heart transplantation."[3] We have advocated for early VAD implantation and consideration for transplantation in challenging patients rather than continuing to pursue palliative univentricular procedures and waiting until patients are too sick to have good waitlist or post-transplant outcomes.[3,4] However, the authors do believe that patients with hypoplastic left heart syndrome who present in shock with organ insufficiency but preserved function can be palliated with bilateral pulmonary arterial banding and resuscitated to a point in which they can usually undergo a successful Norwood.

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Pursuing transplantation for our univentricular patients must not be viewed as a failure of single-ventricular palliation, nor should it be viewed as a last-resort, "bail out" option when such palliations fail. Sometimes, making big decisions up-front (listing for transplantation while the patient still has a favorable clinical profile) is better than taking incremental steps when the risk for long-term success is small. Sometimes, we must go "all in" and commit to primary VAD/cardiac transplantation over staged palliation for those complex single-ventricle patients for whom data have shown us their poor hand.

References

1. Bleiweis MS, Fudge JC, Peek GJ, Vyas HV, Beltran SC, Pitkin AD, et al. Ventricular assist device support in neonates and infants with a failing univentricular circulation. *J Thorac Cardiovasc Surg Tech*. 2022;13:194-204.
2. Singh TP, Cherikh WS, Hsich E, Chambers DC, Harhay MO, Hayes D, et al. The International Thoracic Organ Transplant Registry of the International Society for Heart and Lung Transplantation: twenty-fourth pediatric heart transplantation report—2021; focus on recipient characteristics. *J Heart Lung Transplant*. 2021;40:1050-9.
3. Riggs KW, Zafar F, Lorts A, Chin C, Bryant R, Tweddell JS, et al. The reality of limping to pediatric heart transplantation. *J Thorac Cardiovasc Surg*. 2020;159:2418-25.e1.
4. Lorts A, Conway J, Schweiger M, Adachi AAI, Amdani S, Auerbach SR, et al. Selection and management of pediatric and congenital heart disease patients on ventricular assist devices. *J Hear Lung Transplant*. 2021;40:709-32.