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Commentary: Unicorns and leprechauns

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CENTRAL MESSAGE

The best initial therapy for hypoplastic left heart syndrome remains controversial. There is no clear winner between transplantation and palliation. A paradigm-shifting breakthrough is needed.

Stackhouse and colleagues[1] report on the cohort of patients with aortic atresia (read: hypoplastic left heart syndrome [HLHS]) enrolled from 1994 to 2000 in the Congenital Heart Surgeons' Society study comparing outcomes of different initial management strategies. The focus of this manuscript is on the 2 most common initial interventions—surgical palliation and listing for primary cardiac transplantation. The authors discovered that survival with primary transplantation, including waitlist mortality, was superior to surgical palliation. They also evaluated quality-of-life and found that those undergoing primary transplantation reported fewer symptoms but equivalent quality of life.

This is a significant paper, as it both compares medium/longer-term outcomes between the 2 most common initial therapies for HLHS and prompts continued debate and investigation about what the best initial therapy should be for this challenging lesion. As mentioned, the major strength of this manuscript is the continued follow-up through adolescence of patients intervened in as neonates. However, the cohort is historical, and only 2 of the 26 participating centers regularly performed primary transplantation. I wonder if the findings would be the same if the cohort was more recent. Results have improved drastically since 1994 for surgical palliation. We discovered that our in-hospital mortality after surgical palliation was halved (28.7% to 14.9%) when comparing the late 1990s with the early 2000s.[2] And, for the lowest-risk patients, those with 0 to 2 risk factors, mortality was 5% to 10% in the most recent era.[2] Better early survival would certainly improve medium/longer-term survival. Others report that primary neonatal heart transplantation has a waitlist mortality up to 34%.[3] And, with operative mortality being reported around 10%, it is hard to champion primary heart transplantation as drastically superior when more than 40% die before transplantation or shortly after.[4] Even if transplantation was clearly better, the problem of donor organ shortage persists.

With neither therapy a dominant winner, where do we turn for answers? Mythical creatures seem absurd to mention at this writing, but many would categorize xenotransplantation and the perfect ventricular assist device in the same family as unicorns and leprechauns. Xenotransplantation is often described as forever the future of heart transplantation. However, given recent advances in genetic engineering and immunobiology, some have called for increased efforts to try pig-to-human neonatal heart transplantation. The scientific rationale includes immunologically privileged neonates and the following: inducing B-cell tolerance (elimination of major pig antigens along with the immature B-cell response in neonates) and thymectomy at time of operation along with pig thymus transplantation to blunt the neonatal T-cell response.[5] It is also well described and experienced that durable mechanical support in neonates with HLHS is nearly uniformly fatal. Hemorrhage, thromboembolism, and size constraints continue to limit widespread, long-term application of this therapy to our smallest, most complex patients.

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We all sit and hope that a new, miniaturized device with a blood-friendly surface will become available. Until there is a paradigm-shifting breakthrough, we continue for surgical palliation for low-risk patients and hybrid stage 1 palliation as a bridge to transplantation for greater-risk patients.

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Commentary: No justification for transplantation in place of standard surgical palliation

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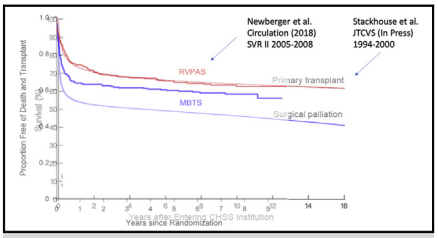

Outcomes for Norwood palliation with RVPAS in SVR II overlap primary transplantation outcomes.

In their review of CHSS data from 1994 to 2000, Stackhouse and colleagues[1] make clear their point that a strategy of surgical palliation for treatment of aortic atresia during an earlier generation carried a greater early risk of death than primary transplantation. This observation led them to conclude that it may be reasonable to encourage full utilization of primary pediatric transplantation, including extension to more aggressive use of primary transplantation in patients with aortic atresia today. Although they acknowledge that improvements in outcomes have shifted this analysis considerably, they hold to the conclusion that transplantation remains a comparable therapeutic strategy, and that it might be of value to advocate for primary transplantation both for patient outcomes and to encourage full donor organ utilization.

CENTRAL MESSAGE

Primary transplantation in high-risk cases of aortic atresia may be justified, but choosing transplantation over standard-risk palliation risks harm to both patient and society in the current era.

The authors provide a more detailed analysis of the long-term comparisons between primary transplantation and surgical palliation with analysis of quality of life measures using the PedsQL and PedsQL Cardiac Module, demonstrating comparable results in functional, psychological, and quality of life indicators between children undergoing primary transplantation and those undergoing surgical palliation. Clearly, the Fontan is far from a cure. However, flipping this interpretation, it is equally clear that transplantation itself is simply an alternative but largely equivalent means of palliation.

This study identifies a prescient debate for our profession today, successfully highlighting key decision

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