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Utilization of Mechanical Assist Devices in Pediatric Patients with End- Stage Heart Failure

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Introduction

Significant advancements have been made in the field of **mechanical circulatory support for adults** over the last two decades. However, **progress in pediatric cases has been hindered by size limitations**. Despite this, **the latest left ventricular assist devices (LVADs)** are now totally implantable, connected to the drive unit with a driveline, offering continuous blood flow in a **relatively small size**. This advancement makes a considerable number of **pediatric patients suffering from end-stage heart failure eligible for mechanical support**, providing a safe bridge to transplantation **in the face of organ donor scarcity**.

Materials and Methods

A cohort of ten patients aged between 9 and 18 years underwent durable implantation of LVADs. Among them, six had dilated cardiomyopathy, two had congenital heart defects, one had arrhythmia-induced cardiomyopathy, and one had chemotherapy-related cardiomyopathy. The mean duration of follow-up on mechanical support was 27 months, with the longest support lasting 10 years.

Results

Five patients died while on mechanical support due to complications related to the LVAD. Three patients were successfully transplanted as a bridge to transplantation. In one patient, the device was explanted as a bridge to recovery. One patient is still on circulatory support, awaiting transplant.

Conclusion

Heart transplantation remains the gold standard for end-stage heart failure in both adults and children. The scarcity of donor organs continues to be a major limitation in transplant practice. Safe and durable mechanical circulatory support, provided by new generation LVADs, offers a promising solution to bridge children with end-stage heart failure to transplantation.