Commentary: Minimally invasive approaches in congenital heart surgery—A service we owe children to help them thrive, not a gimmick to make our lives easier

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In this issue of the *Journal*, Pradegan and colleagues¹ report on an infant with single-ventricle physiology who qualified for a primary bidirectional cavopulmonary anastomosis (Glenn operation) in a developing country with limited resources. In frugal settings, preoperative catheterization was spared in favor of direct intraoperative measurements and decision making, forgoing the luxury of cardiopulmonary bypass to perform off-pump surgery by using a temporary venovenous shunt. Their creativity is to be commended, because the patient did well both initially and at 2 years of follow-up.

What, however, would have been the best surgical approach? Although the desire to limit catheterization and bypass machine costs is understandable, it is standard to perform a bidirectional Glenn through a median sternotomy, rather than resorting to the midaxillary thoracotomy approach chosen and justified by Pradegan and colleagues,¹ to avoid potential scar tissue in the future when anticipating a median sternotomy for the next staged palliation. How did Pradegan and colleagues¹ plan? From their perspective as surgeons, or from what the child and the child's family would have wanted? One hidden incision beneath the right arm, or most probably 2 incisions, because the child will inevitably need Fontan completion, which will require adding a median sternotomy scar to the child's chest?

I disclose being a strong advocate for minimally invasive approaches to correct a wide range of congenital heart defects that are “curable” with a single operation in a child's lifetime.²⁻⁴ My group's initial experience started in Switzerland with atrial septal defects as early as 2001,² expanding to more diagnoses, such as ventricular septal defect, partial atrioventricular canal with mitral valve cleft, partial anomalous pulmonary venous return, and cor triatriatum.^{3,4} In my personal experience in the last 15 years, hundreds of infants and children, as small as 5 kg up to teenage size, have benefitted from the approach, which has obvious cosmetic,

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Central Message

Minimally invasive congenital heart surgery is a powerful tool to enhance quality of life, considering functional, cosmetic, and psychologic benefits offered to kids from their perspective, not ours.

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functional, and psychologic benefits.^{5,6} The children are extubated in the operating room, spend 1 night in the intensive care unit, and leave the hospital on average after 3 days, which is a day shorter than the experience of children with the same defects operated on through a median sternotomy. After discharge, the children are not restricted and are physically extremely active within days of surgery. As such, short-term benefits are obvious. In the mid- to long-term for a growing child and future adolescent, to have a scar barely visible underneath a resting right arm diminishes the lifelong psychological burden of being “a heart patient,” as opposed to having a visible median sternotomy scar, which points to one obvious vital organ that needed repair.

During the lifetime of a baby, child, adolescent, and young adult with congenital heart disease, it is important to look at the benefits and goals of the minimally invasive strategy we aim to offer the patients and their families from their perspectives, and not from ours as surgeons.⁷ In an infant with single-ventricle physiology, planned stage reoperations are the rule. This infant will undergo another operation, which will need a median sternotomy, leading to a second scar on the chest. In other patients with various defects, congenital or acquired, multiple operations are necessary to achieve long-lasting outcomes, and staging their incisions for our comfort, rather than what they

need, is questionable. Cardiothoracic surgeons treating babies and adults have gained tremendous experience with repeat sternotomies, thereby thankfully reducing the risks of redo surgery. Planning 2 scars on a child's chest simply to make it easier on ourselves seems unjustifiable, and is probably a disservice to the patient. If the minimally invasive approach is intended to positively affect quality of life, it needs to be offered wisely. When focusing on growing children who should thrive as normally as possible, physically and emotionally, we should see the world through their eyes, not ours.

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