The ongoing quest for an ideal surgical repair for tetralogy of Fallot: Focus on the pulmonary valve

Charles D. Fraser, Jr, MD

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Isn't it fascinating to observe that there are so many different ways congenital heart surgeons perform tetralogy of Fallot (TOF) repairs? Even in an era when information flows freely, and we are virtually deluged by meetings, journals, and on-line media, surgeons continue to debate the proper treatment strategy for this common congenital cardiac problem. After decades of surgical progress, and with many surgeons and surgical units consistently achieving hospital survivals greater than 99%, should we not, finally, be able to agree on the best surgical methodology? To my view, the answer is probably not yet, but perhaps we can all at least agree that we still have a *core question* to address. What I am alluding to, of course, is the optimal surgical strategy to achieve both excellent early results *and* durable long-term right ventricular function. Given the accruing data concerning the long-term challenges patients face years or decades after corrective operations for TOF, overwhelmingly related to right heart performance, it is entirely justifiable to continue to refine surgical strategies. Thus preservation of tricuspid valve function, maintenance of a normal conduction system, limiting injury to the right ventricular infundibulum, and promoting native pulmonary valve function and growth all should arguably have some relevance to long-term right heart performance and patient well-being.¹⁻⁵

In this issue of the *Journal*, Vida and colleagues⁶ have added important insight into ways that surgeons can attempt to affect long-term right heart performance through aggressive attempts to preserve native pulmonary valve function in patients undergoing TOF repair. There are several key points in this article. Through meticulous attention to technical detail and native valve morphology, Vida and colleagues have been able to "preserve" native pulmonary valve function in 56% of their patients

undergoing TOF repair. Useful adjuncts include on-table balloon pulmonary valve dilation, "delamination" of deficient pulmonary valve cusps, and commissural resuspension. Early results appear encouraging, at least in terms of echocardiographic evidence of pulmonary valve insufficiency; however, 95% of patients have been left with at least moderate right ventricular hypertension (pulmonary valve pressure gradients of at least 20-40 mm Hg). Unfortunately, this study cannot tell us whether these efforts will translate into long-term benefit. Will these surgically repaired pulmonary valves continue to grow and maintain adequate function and competence? Is it better to preserve some degree of pulmonary valve competence at the expense of ongoing moderate right ventricular hypertension?

These questions will only be answered through diligent, objective collection of long-term follow-up data. As with other chronic diseases in the evolving field of *transition medicine*, patients undergoing repair with the described surgical modifications need careful, objective follow-up and study. Only then will we truly know what effects this strategy and others have on right ventricular function and outcomes in patients after TOF repair.

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From the Department of Congenital Heart Surgery, Texas Children's Hospital, Baylor College of Medicine, Houston, Tex.

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Address for reprints: Charles D. Fraser, Jr, MD, Department of Congenital Heart Surgery, Texas Children's Hospital, Baylor College of Medicine, 6621 Fannin St, West Tower, TCH 19th Floor, Houston, TX 77030 (E-mail: charlesf@bcm.edu or cdfraser@texaschildrens.org).

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