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Commentary: Lateral tunnel or extracardiac conduit for a Fontan operation: Is that your final answer?

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When Francis Fontan first performed the procedure that would bear his name, little did he know that 50 years later we would still be debating how best to do it.¹ Despite the extracardiac conduit (ECC) having become the most widely practiced technique, the lateral tunnel (LT) is still commonly used. We are now faced with a growing list of large, single-institution studies and registry reports that seem to provide contradictory evidence regarding which is preferable. A recent study from Boston Children's Hospital has fueled the debate, suggesting that the LT may offer better outcomes despite the global trend toward the ECC.²

The article by Daley and d'Udekem³ is a welcome attempt to appraise the available literature to try and give us a final answer. The wealth of data look ripe for a detailed meta-analysis, but we acknowledge that it is not that simple. Indeed, it is nearly impossible to adjust for the myriad variables and missing data that confound so many of the published studies. Even more importantly, the exact pre-Fontan hemodynamic parameters vary from study to study. Data are frequently incomplete and an intrinsic confounding era effect is often present, considering the earlier development of an LT. All of these make the construction of a meaningful meta-analysis difficult, as previous authors have found.⁴

Knowing the problems of the failing Fontan, it makes good sense to completely exclude the atria from the Fontan circuit, thus avoiding the atrial distension that can be a

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What is the best surgical strategy for a Fontan operation? Is that your final answer?

CENTRAL MESSAGE

Outcomes for the Fontan circulation are excellent with no definitive answer regarding which surgical strategy is preferable.

prequel to atrial arrhythmia and thrombosis. Daley and d'Udekem's analysis³ does indeed suggest that ECC may reduce these risks, but that an appropriately sized conduit must be chosen (influenced by age at Fontan). Conversely, incorporation of the right atrium into the Fontan pathway does allow some distensibility and venous capacitance,

FIGURE 1. What is the best surgical strategy for a Fontan operation? Is that your final answer?

which may explain why the LT is associated with less and shorter duration of pleural drainage.

The truth seems to be that both provide extremely effective Fontan circulations with nearly entirely equivalent outcomes. In a Fontan physiology, good ventricular function and low pulmonary vascular resistance pretty much trump anything and are likely to be far more important in dictating outcomes than the exact type of the Fontan we choose.⁵ The roles of fenestrations and anticoagulation regimens may also have much more relevance than LT versus ECC.

We can be reassured that both LT and ECC have excellent outcomes and, to some extent, we are free to choose what we are most comfortable with. The authors suggest a randomized clinical trial (always the ideal solution) but the reality is that there may be little appetite for this given that outcomes with both are so good. It may be that new large registries, such as the Australia and New Zealand Fontan Registry, may give us the answer.

Given the efficacy of both techniques, future interest is likely to be more focused on providing augmentation for the existing Fontan circulations, whether as mechanical or bioassisted, temporary or permanent systems. Which is better, LT or ECC? Final answer: We don't know yet (Figure 1).

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Commentary: The Fontan technique controversy: Where is the real equipoise?

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Daley and Udekem¹ summarize a PubMed database search of reported outcomes comparing the lateral tunnel and extracardiac conduit (ECC) techniques for the modified Fontan operation. Following an extensive review of

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CENTRAL MESSAGE

The optimal technique for the Fontan operation remains elusive. Other long-term challenges of the Fontan physiology dominate our decision-making.

pertinent publications, the authors conclude that "after almost 3 decades, there is little evidence of the superiority of one technique over the other in terms of long-term outcomes." However, a number of potential differences are discussed. In viewing this controversy, we see common themes that have played out in other areas of cardiac surgery, namely, the presumptive advantage of cardiac reconstructions using autologous tissues with the opportunity for

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