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DOES THE APICOCAVAL JUXTAPOSITION FIT BETTER WITH A LATERAL TUNNEL OR AN EXTRACARDIAC CONDUIT?

To the Editor:

We enjoyed the recent article by Weixler and colleagues,¹ which shows an improvement in the survival of patients who underwent a Fontan operation with a lateral tunnel compared with an extracardiac conduit (EC). This study compared 638 patients who underwent the Fontan with the lateral tunnel with 163 patients who received the EC technique. The authors demonstrated that a lateral tunnel Fontan is associated with better short-term and midterm outcomes and that early spontaneous fenestration closure is an independent risk factor for mortality.

One additional aspect that would have been nice to explore is how these strategies adapt to patients with apicocaval juxtaposition (AJ). AJ is a morphologic feature of the cardiac apex that points to the ipsilateral side of the inferior vena cava (IVC) and therefore may complicate a Fontan procedure. This malformation may be present in up to approximately 14.7% to 24.2% of patients undergoing the Fontan procedure.²⁻⁴

If an EC between the IVC and the contralateral pulmonary artery is used, the long curve route crosses the spine and can cause kinking and severe energy loss. On the other hand, if the conduit is connected to the ipsilateral pulmonary artery, this is confined to the narrow space behind the ventricle and compression from the ventricle. Beyond these techniques, an intracardiac/EC was proposed.⁵ However, a conduit inside the atrium may disturb the pulmonary venous flow and cause pulmonary venous obstruction, especially for patients with totally anomalous pulmonary venous connection. We recently reported 31 cases of patients who underwent the Fontan with AJ.⁴ The chosen

conduit route was a connection between the IVC and the ipsilateral pulmonary artery in 24 patients and a connection to the contralateral pulmonary artery in 5 patients. An intracardiac/EC was used in another 2 patients. Our current preference is to place the conduit between the IVC and the ipsilateral pulmonary artery to create a straight route and minimize energy loss.

Although a complete evaluation of the impact of hemodynamics on thromboembolic events has not been conducted, the results are promising. Fenestrations closed early, and this may suggest an inferior hemodynamic performance. However, concern remains for AJ as a risk factor for early spontaneous fenestration closure. Additionally, a consensus has not been reached on the use of warfarin in patients with risk factors for lower hemodynamics, such as AJ, totally anomalous pulmonary venous connection, and atrioventricular valve regurgitation.

AJ complicates the Fontan operation. The lateral tunnel Fontan procedure seems to exploit an advantage of less energy loss. However, current reports have not yet shown which approach is superior in patients with AJ requiring the Fontan operation.

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