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Commentary: Please mind the gap between the superior vena cava and the right atrial appendage

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The Warden procedure was designed to treat partial anomalous pulmonary venous return (PAPVR) with a high connection to the superior vena cava (SVC).¹ However, this technique depends on the right atrial (RA) appendage as a conduit for upper body systemic venous blood to the right atrium. Thus, PAPVR with a high connection to the SVC and a small RA appendage poses a technical challenge (Figure 1). Standard approaches for high-connection PAPVR include the two-patch technique, in which a baffle is constructed to drain the anomalous pulmonary vein to the atrial septal defect and a second patch is placed across an incision crossing the SVC-RA junction, which has been associated with a high incidence of sinus node dysfunction and pulmonary baffle and systemic venous obstruction.² A longer gap between the SVC and the RA appendage can be bridged using a modified Warden procedure with an advancement flap of RA tissue for the posterior wall of the connection and a patch for the anterior wall.³ However, if the gap is even longer, it must be bridged with an interposition graft.⁴

Once the decision has been made to repair a high-connection PAPVR with an SVC-to-RA appendage with an interposition graft, a suitable material must be chosen. In a previous series of 17 patients from the Mayo Clinic, ringed Gore-Tex (Gore Medical, Flagstaff, Ariz) was used

CENTRAL MESSAGE

High-connection partial anomalous pulmonary venous return with a small right atrial appendage poses a technical challenge that can be overcome with an interposition graft.

for the interposition graft.³ These patients received anticoagulation with coumadin for 3 months.

The innovation described by Kumar and colleagues⁵ in their case report is the use of an aortic homograft for the interposition graft. The advantages of the homograft over Gore-Tex include better hemostasis and potentially less thrombogenicity. Therefore, the authors treated their patient with aspirin only for 3 months. At a 5-month follow-up,

FIGURE 1. High-insertion PAPVR and small RA appendage. PAPVR, Partial anomalous pulmonary venous return; RA, right atrial. Figure created with Biorender.

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they confirmed laminar flow in the conduit with no gradient in the conduit.

The innovative use of an aortic homograft for interposition between the SVC and the RA appendage, along with a thorough and clear description of the operative technique and the potential to avoid anticoagulation, make this an attractive technique. Although the long-term fate of homografts in children as right ventricular-to-pulmonary artery conduits and in some of the early atrial switch procedures is well known, with predictable degenerative calcification, the fate as a venous conduit in adult patients is unknown.⁶ The lack of longer-term follow-up is a further concern, as the risk of chronic SVC obstruction/syndrome, which is associated with a poor quality of life, may outweigh the benefits of avoiding short-term anticoagulation.

In conclusion, high-connection PAPVR with a small RA appendage poses a technical challenge that can be overcome using several different strategies. With longer-term

follow-up, the aortic homograft as an interposition graft may be a welcome addition to the armamentarium of surgeons dealing with this challenging form of PAPVR.

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