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Role of flow preference in decision making regarding the use of Blalock-Taussig shunt

To the Editor,

I read with great interest the work by Arnaz et al. (1) published in your journal.

I noticed that the authors did not comment on the flow preference in their study. I suggest that flow preference is an important factor influencing the success of shunt surgery.

Notably, Blalock–Taussig shunt (BTS) surgeries are challenging in new-borns because of unpredictable short- and long-term outcomes in each patient (2). Surgical planning and decision making for the location of the shunt, graft diameter, and type of shunt are crucial for the success of surgery.

The primary goal of shunt surgery is often to increase pulmonary blood flow and/or to promote pulmonary artery growth. Pulmonary blood flow is an important factor for vessel growth, which has been demonstrated especially in patients with shunts (3). Therefore, I suggest that flow preference is an important factor for surgeons to plan the shunt location and type. Although not discussed in this manuscript, right modified BTS flow preference is consistently toward the right pulmonary artery regardless of pulmonary artery diameter or resistance and anastomosis angle. In their previous study of shunt hemodynamic based on specific data of a patient, the same medical engineering group has demonstrated that flow preference is strongly dependent and parallel to shunt site (4). Based on the results of these computational fluid dynamic (CFD) studies, we can conclude that shunt must be located at the same site of the hypoplastic pulmonary artery when aiming to promote its growth. Promoted growth of the pulmonary artery can prevent subsequent pulmonary arterioplasty in the second stage of surgery, which is another important factor to avoid complex future surgeries.

On the other hand, anatomy of patients cannot be standardized and can be very restrictive for surgical practice, especially in patients with hypoplastic arteries at the counter side of the arcus. Central shunts appear to be a practical solution, with some reserve about pulmonary over flow. However, this risk can be overcome by using a smaller sized shunt to control the pulmonary flow, as demonstrated previously (2, 4).

In conclusion, surgical planning needs a meticulous preoperative assessment using multidisciplinary approach. I believe that the use of new tools to mimic and analyze hemodynamic problems can be useful to decrease morbidity and mortality, especially in challenging cases. Recently, CFD has become a popular tool for elucidating physiopathology to prevent certain possible complications of congenital heart surgery (5). I suggest that surgeons should make an effort to optimize the results with the routine use of CFD in clinical practice.

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