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Commentary: Key is reproducibility

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CENTRAL MESSAGE

Salve and colleagues reported modified pulmonary artery banding, prompting pulmonary valve preservation without distortion of the artery and stable flow restriction in arterial switch operation.

Main pulmonary artery banding (mPAB) is a common palliative strategy to control excessive pulmonary blood flow in various types of congenital heart diseases. Although it is generally a simple and effective procedure, mPAB is notorious for its unpredictability and inaccuracy in its tightness and subsequent impact on balancing the physiology. The difficulty of the conventional mPAB stems from dynamic physiologic and hemodynamic changes during mPAB due to sudden change in the ventricular afterload[1] and also due to somatic growth overtime, which acts as "natural tightening." Anatomic distortion of the branch pulmonary artery (PA) and the pulmonary valve are also common and troublesome problems of this strategy. Salve and colleagues[2] opened a new avenue for PA flow-restriction technique as a replacement for traditional PA banding in children with transposition physiology and unrestricted pulmonary blood flow. The innovation is the use of a polytetrafluoroethylene tube as an interposition graft "band" as opposed to a traditional band. This technique, a similar concept to the endoluminal PAB,[3] allows an accurate control of the internal diameter of mPAB. Furthermore, the specific drawback of the traditional mPAB in the setting of the palliative arterial switch procedure is that the band needs to be placed on the freshly reconstructed neopulmonary artery, which tends to cause significant scar formation by the time of the second surgical intervention. This method certainly minimizes, if not eliminates, excessive scar formation around the posterior patch reconstruction area of the neopulmonary root. The authors applied this method to 13 patients with a complex form of transposition of the great arteries with 100% survival, which should be congratulated. The authors reported a high rate of branch pulmonary distortion and requirement of patch augmentation at the time of the second intervention, which is the combination of the result of Lecompte maneuver and stretching and potential distortion by the interposition graft.

The biggest advantage of this method is its predictability, reproducibility, and potential less distortion to the reconstructed pulmonary artery root. Nonetheless, there may be some drawbacks in this technique. There may be a scenario in which the patient needs to wait longer to undergo the second surgery and then the interposition graft, particularly when a 3.5-mm or 4-mm graft is placed, may become too obstructed, thereby causing significant pressure overload to the ventricle. The traditional mPAB site can be dilated by balloon dilation in some cases if it becomes too obstructed, but this method does not allow any catheter-based

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intervention. In addition, calibration of the length of the interposition graft may be difficult, as a too-long graft may compress the distal PA and may also create too much resistance.

The authors should be congratulated in inventing this innovative approach and excellent clinical outcomes, and the technique will be used in palliative various types of complex congenital heart diseases in the future.

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