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Commentary: Uncrossing the right to make it right!

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The aortic uncrossing procedure, first reported by Planché and Lacour-Gayet,¹ addresses a “circumflex aorta,” the combination of a right aortic arch with a left ligamentum arteriosum and a descending thoracic aorta that crosses posteriorly from right to left above the level of the tracheal carina. It is generally performed through a median sternotomy with cardiopulmonary bypass and moderate-to-deep hypothermia and short period of circulatory arrest.²

In the current case depicted by Said and colleagues,³ the authors use descending aortic perfusion and maintenance of whole-body perfusion, removing the need for lower-body circulatory arrest and hypothermia. This technique of cannulating the descending aorta has been described before, initially by Yasui and colleagues⁴ in 1993 and then further refined by other groups. Descending aortic perfusion has the advantage of not requiring deep hypothermia, as the entire operation can be done with continuous perfusion. This may translate into less acute kidney injury and more rapid postoperative progress. Provided the ascending and descending cannula sizes are the same, then the distribution of the flow to the lower body will be determined by the peripheral vascular resistance and similar to ordinary cardiopulmonary bypass flow without cross clamping. Operation for circumflex aorta is an ideal application of this approach and is best done as a young infant whilst the aorta maintains maximal elasticity to ease mobilization.

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CENTRAL MESSAGE

Distal aortic perfusion allows correction of the circumflex aorta, maintaining full perfusion. Airway considerations are paramount.

In our experience of 2 similar cases, the aortic uncrossing procedure effectively reduced external airway compression, as pointed out by the authors,³ but the postoperative course was complicated by tracheobronchomalacia at the site of previous airway compression. Relief of extrinsic compression unmasks this tracheal pathology, and both patients required a period of postoperative noninvasive ventilation. Others have noted the utility of airway pexy to address the collapse of the deformed airway that often manifests after withdrawal of positive pressure ventilation.⁵ Recurrent laryngeal nerve palsy may further complicate recovery.

Preoperative computed tomography may not fully characterize functional impairment of the trachea related to airway collapse. It is, therefore, prudent to visualize the airway both before and after uncrossing surgery, particularly if weaning from ventilation is difficult. Residual tracheal deformity can then be addressed by pexy, external support, or resection. A dynamic postoperative study of the airway is required in those who fail to gain early and substantial benefit. Fortunately, the need for airway procedures to follow an aortic uncrossing operation is unusual, and most patients gain an excellent functional result by uncrossing alone.

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