UPMC CHILDREN'S
HEART INSTITUTE

Getting the Correct Vessel onto to Left Ventricle: Techniques for Optimizing Aortic Relocation in Complex Conotruncal Abnormalities

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History- 1969 Rastelli

Complete Repair of Transposition of the Great Arteries with Pulmonary Stenosis

A Review and Report of a Case Corrected by Using a New Surgical Technique

By G. C. Rastelli, M.D., Robert B. Wallace, M.D., and Patrick A. Ongley, M.D.

SUMMARY

Complete surgical correction of transposition of the great arteries associated with subvalvular pulmonary stenosis carries a high mortality rate. A new surgical technique that achieves redirection of the ventricular outflows and relieves pulmonary stenosis by bypassing it, was successfully used to repair complete transposition of the great arteries associated with ventricular septal defect (VSD) and valvular and subvalvular pulmonary stenosis in a 14½-year-old patient. The repair consists of (1) division of the pulmonary artery, the cardiac end of which is oversewn, (2) repair of the VSD with a patch in such a way as to connect the left ventricle with the aorta, and (3) reconstruction of the pulmonary artery with an aortic homograft, including the aortic valve, which is anastomosed between the distal end of the pulmonary artery and the right ventricle.

A review of the cases in which the current techniques were used indicates that the location and nature of the obstruction in the left ventricular outflow tract defies successful repair in most instances. Localized ridges and diffuse hypoplastic outflow tracts are recognized causes of obstruction, but anomalies of the mitral valve commonly contribute to or are the primary cause of subvalvular obstruction.

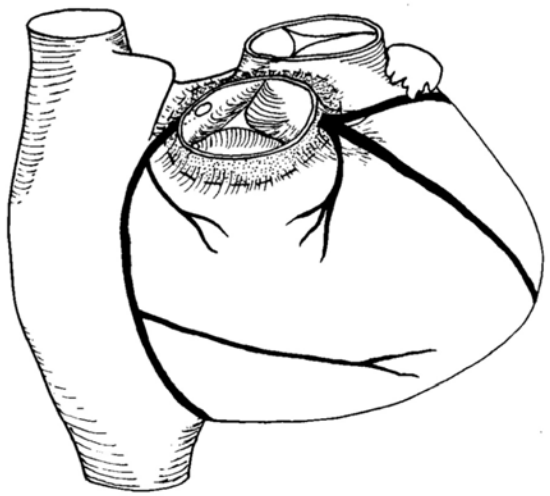
Concluding Remarks

Successful repair in a case of complete transposition of the great arteries associated with VSD and valvular and subvalvular pulmonary stenosis was carried out in a 14½-year-old boy. A new surgical technique that achieved redirection of the ventricular outflows was employed.

The rationale for seeking an alternate technique to transposition of the venous return as described by Mustard is the high surgical mortality rate with which transposition with subvalvular pulmonary stenosis is associated when complete repair with that technique is carried out. A review of the cases in which this technique was used indicates that the location and nature of the obstruction in the left ventricular outflow tract defy successful repair in most cases.

The success of the surgical repair described herein is possible because the technique does not require direct approach to the subvalvular stenosis but bypasses it. Anatomic as well as physiological repair is achieved because the anatomic right ventricle is made to empty into the pulmonary circulation, while the anatomic left ventricle empties into the systemic circulation.

History- 1980 Bex/LeCompte



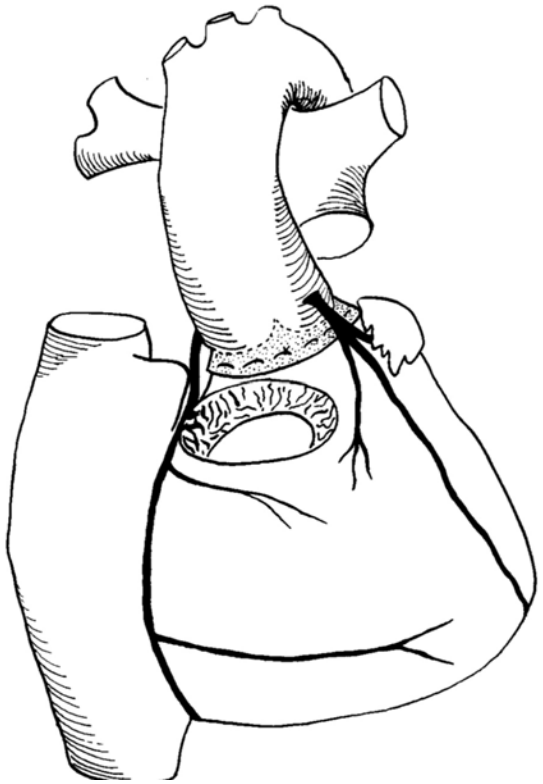


Fig 1. The broken line represents the incision below the aortic annulus, in the infundibular part of the right ventricle. The incision begins anteriorly, goes under the initial segment of the coronary arteries, and is completed in front of the pulmonary artery where 7 mm of muscle separate the two annuli.

ABSTRACT **This method of true anatomical repair of transposition of the great arteries (TGA) avoids the transection and suture of the coronary arteries and does not require any tubes of foreign material. Because the transection goes through the infundibulum under the aortic annulus, the complete aortic root together with the coronary arteries and a muscular subvalvular rim can be sutured to the pulmonary annulus.**

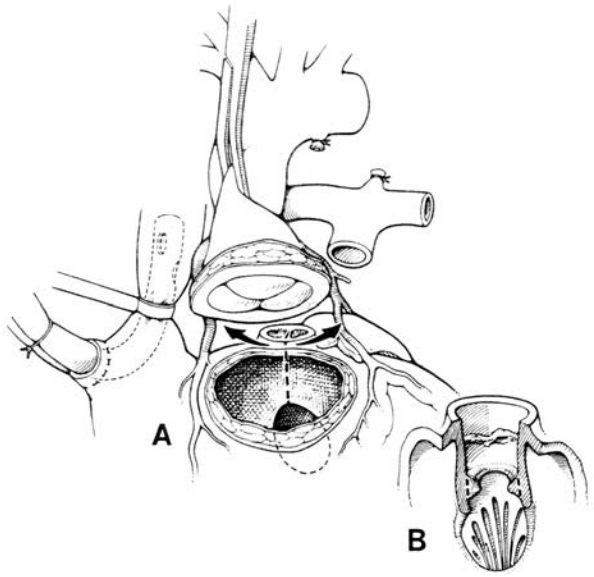
The technical simplicity of this procedure allows its application in TGA with intact ventricular septum in the newborn when the left ventricular pressure is still high or after the left ventricle has been "prepared" by previous banding of the main pulmonary artery.

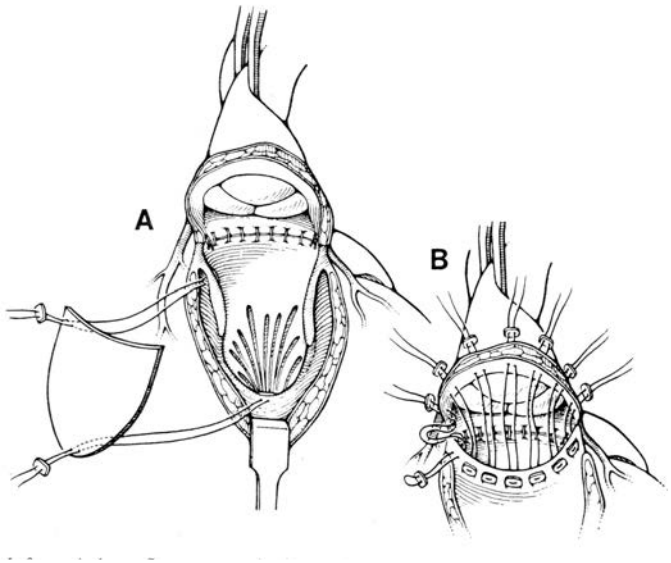
History- 1984 Nikaidoh

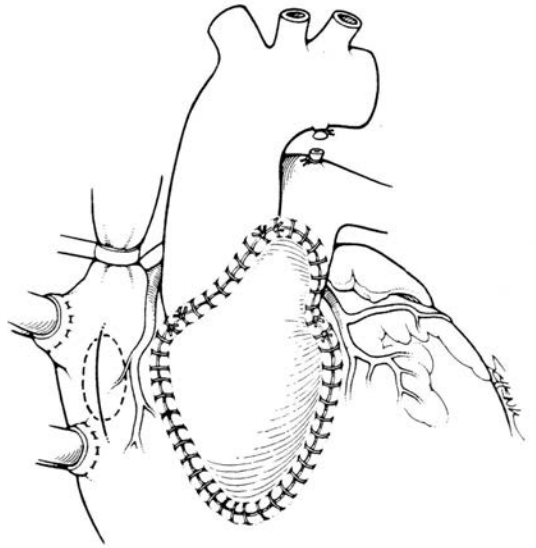
J Thorac Cardiovasc Surg 88:365-372, 1984

Aortic translocation and biventricular outflow tract reconstruction

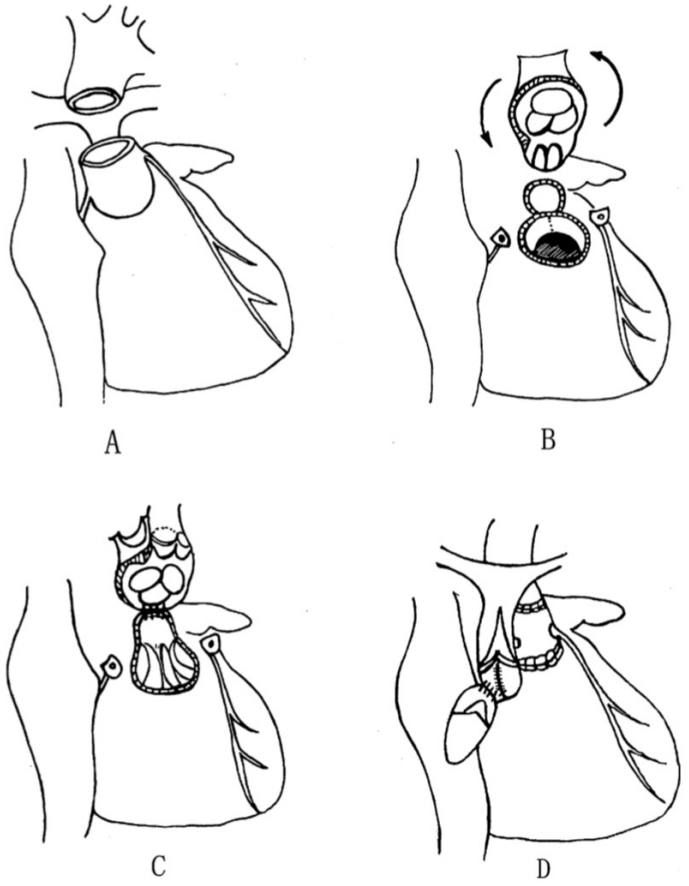
A new surgical repair for transposition of the great arteries associated with ventricular septal defect and pulmonary stenosis



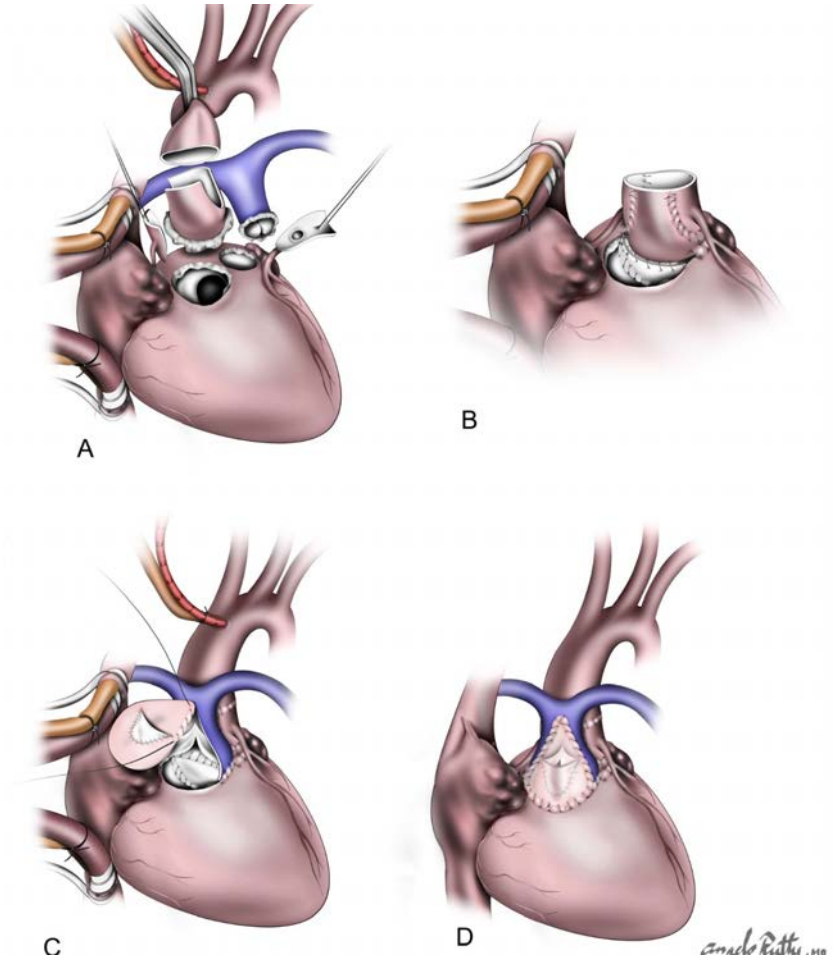




Yamagishi 2003- Half-turned Truncal switch

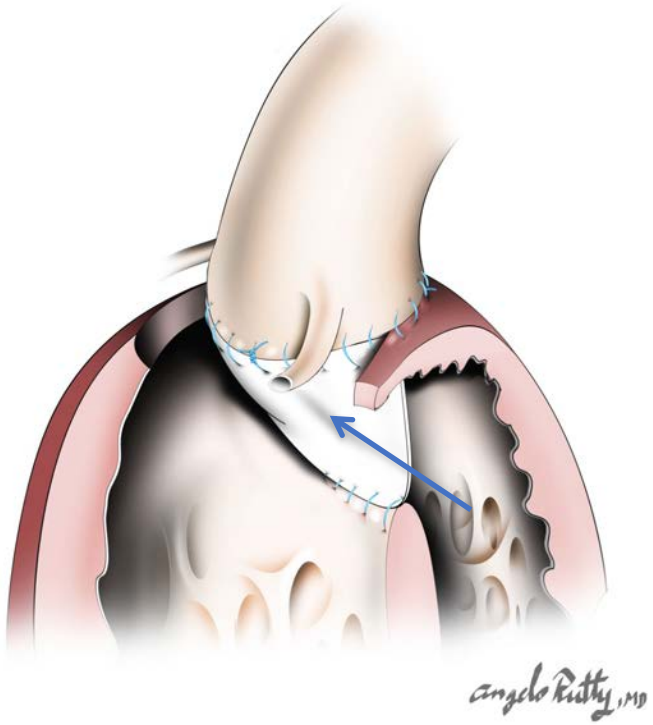


Double root translocation

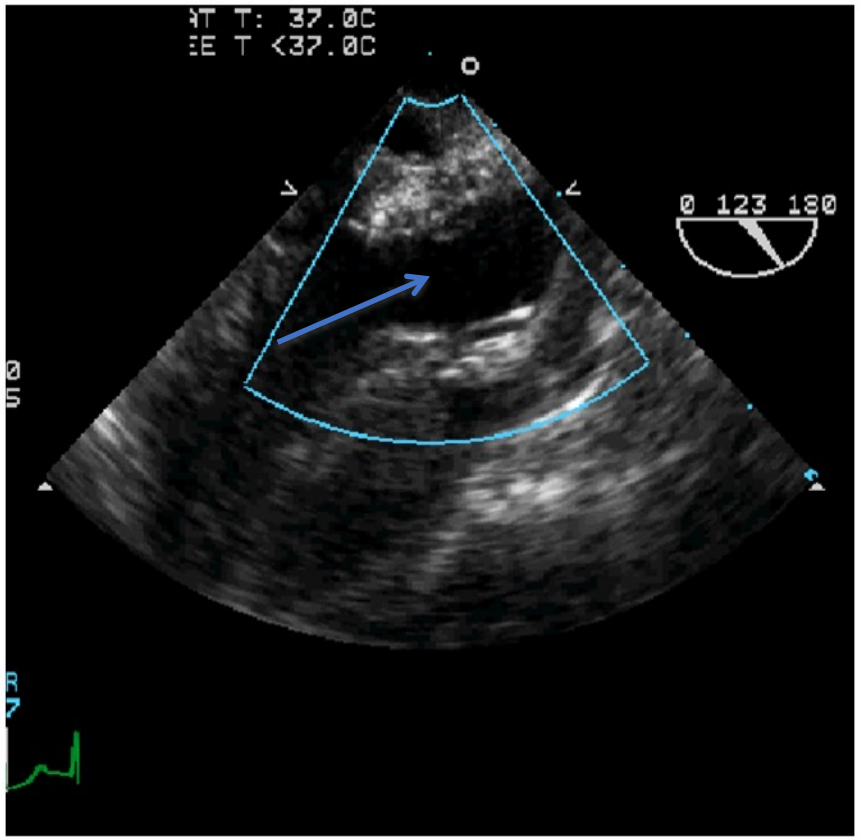


Major Contribution

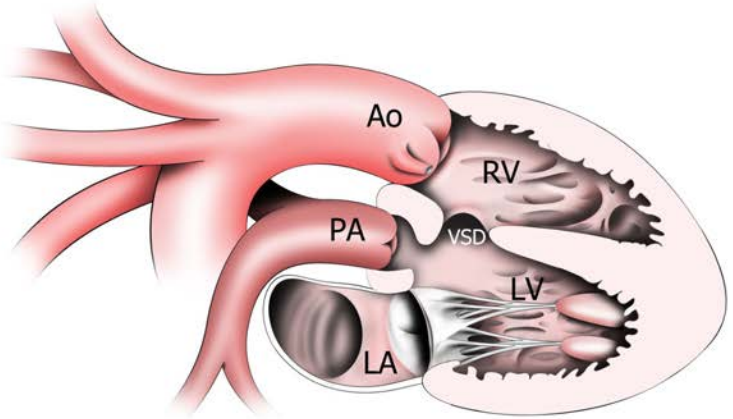
Posterior Translocation of the Aorta



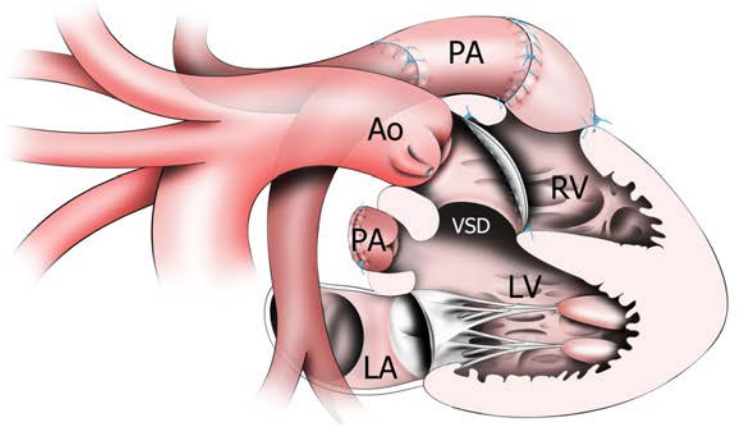
Postop ECHO



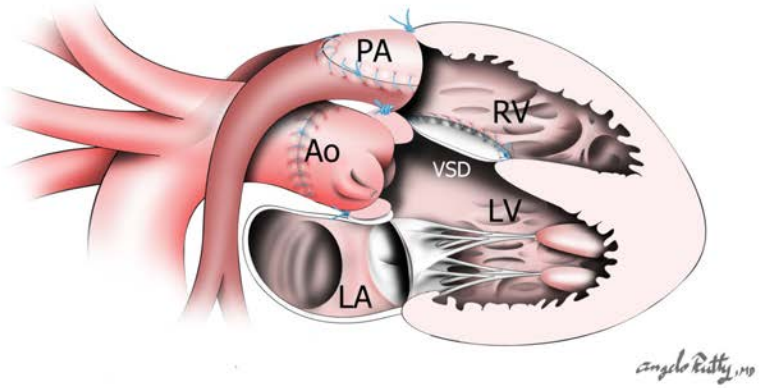
TGA/VSD/PS

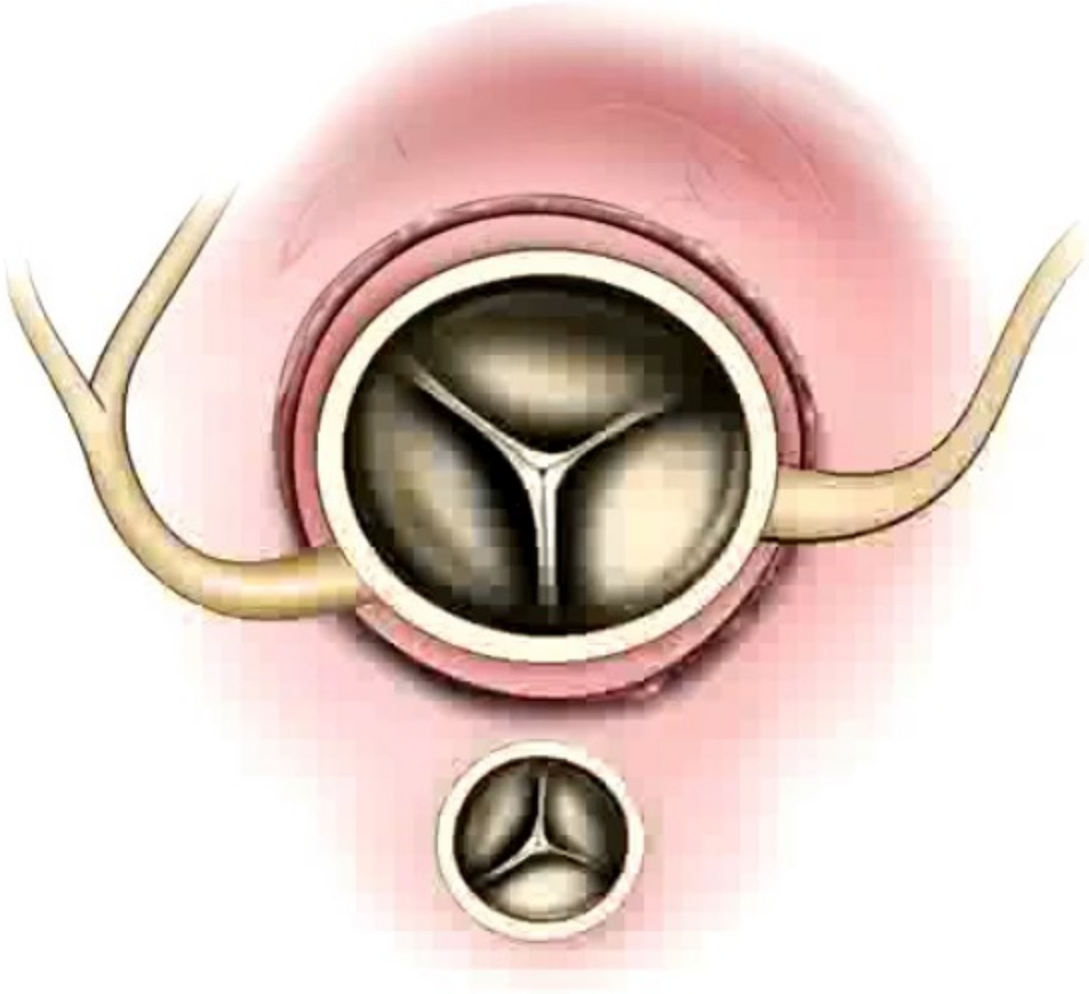


Rastelli

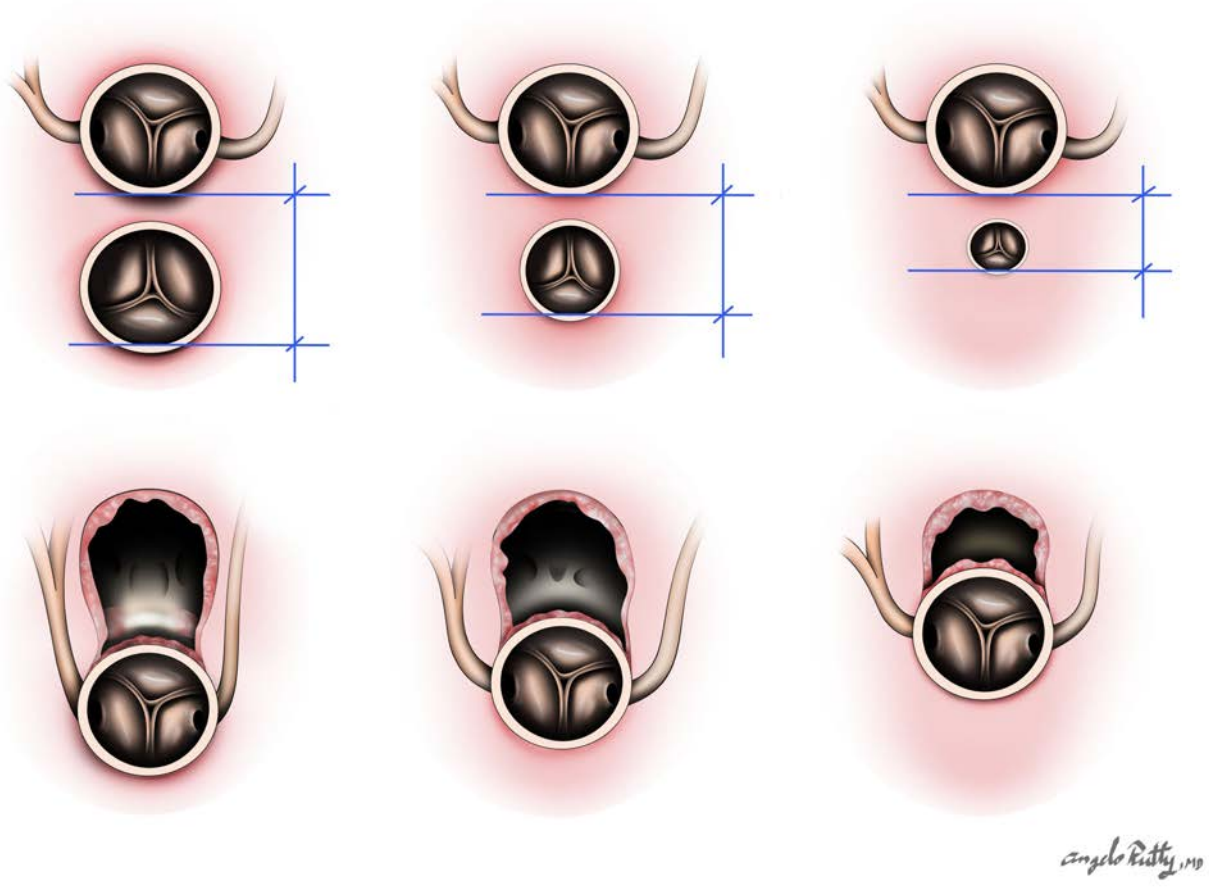


Nikaidoh



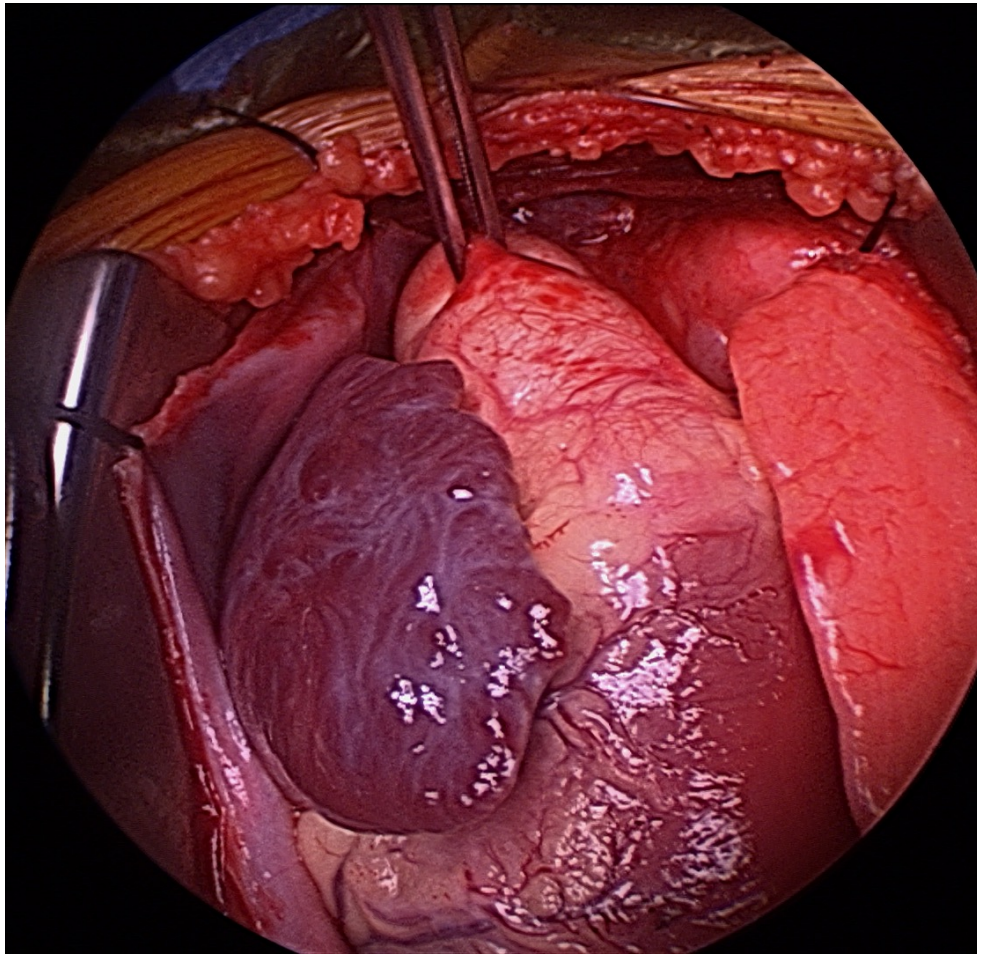


Translocation distance

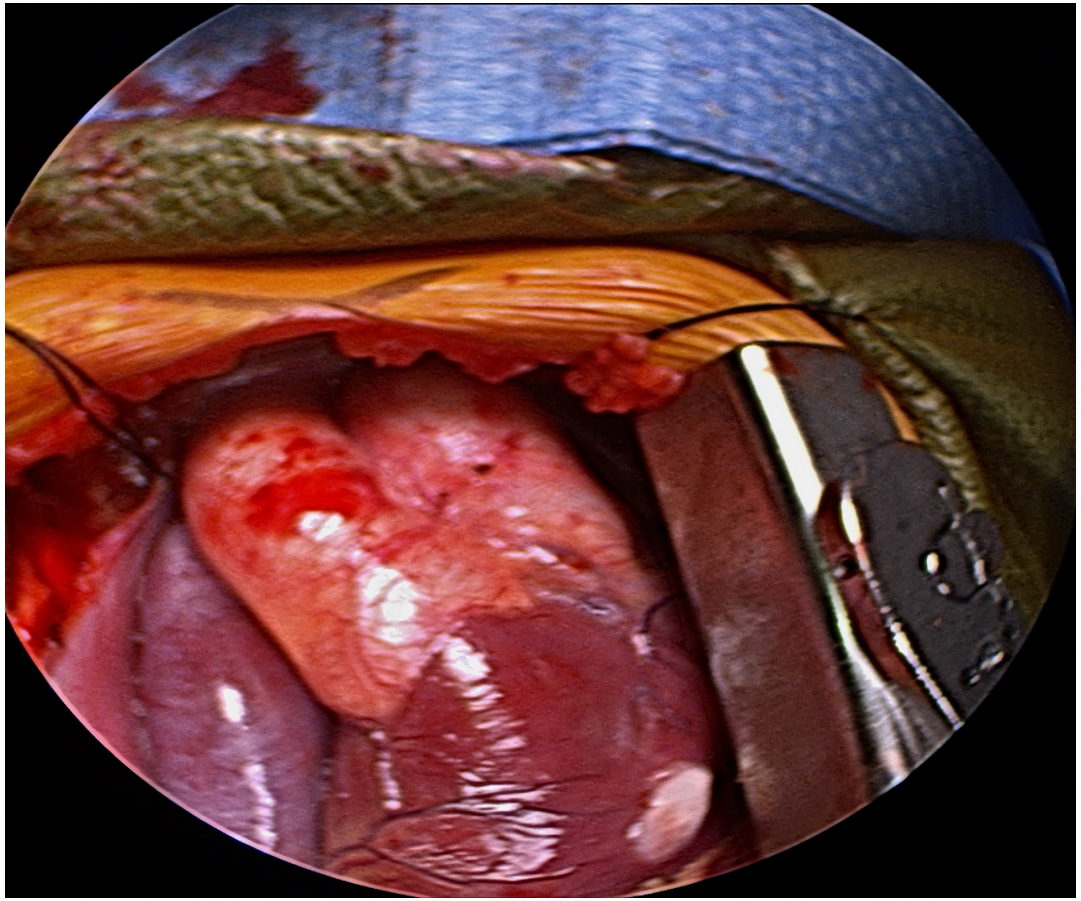


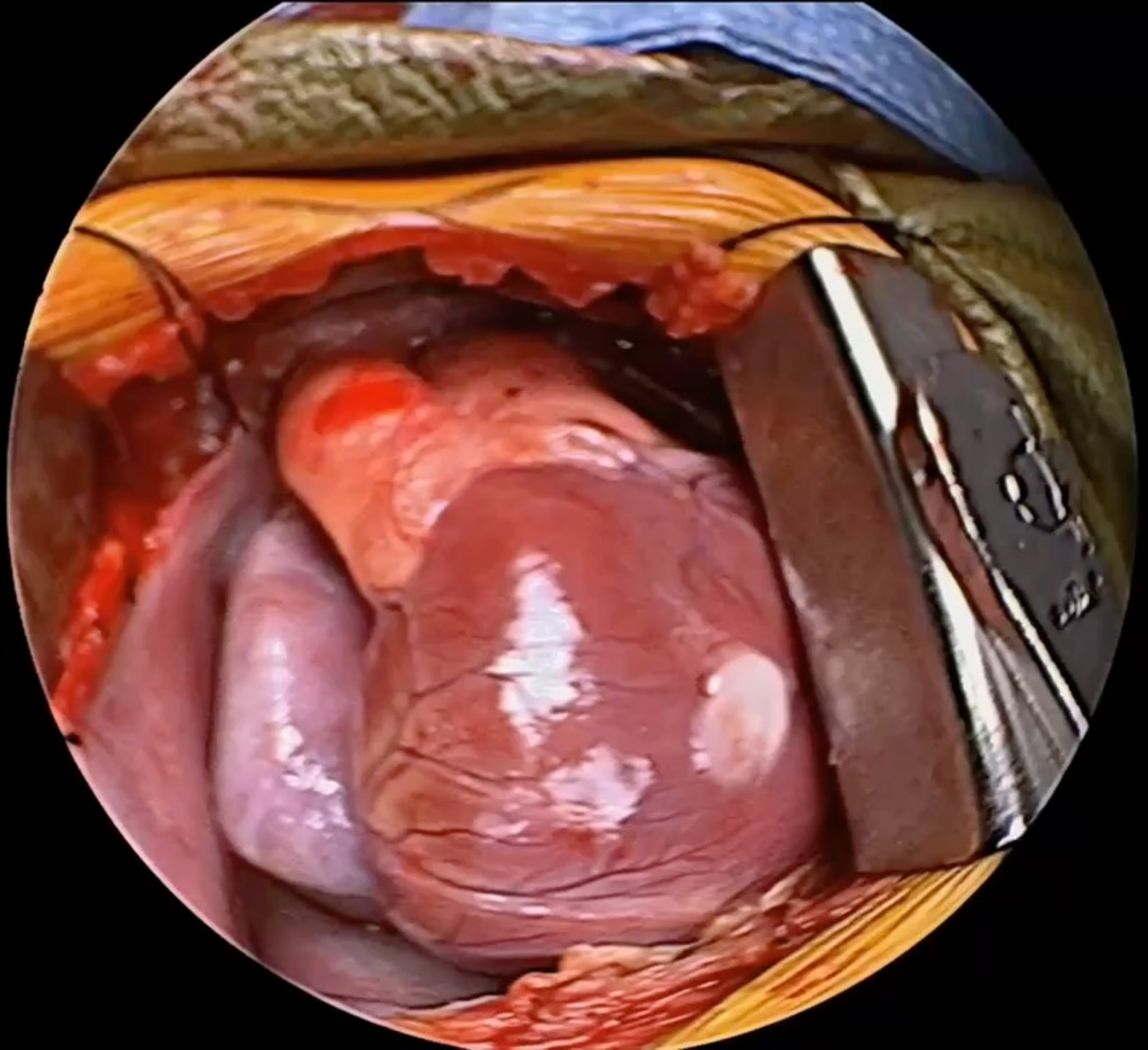
Great Vessels Spatial Relationship

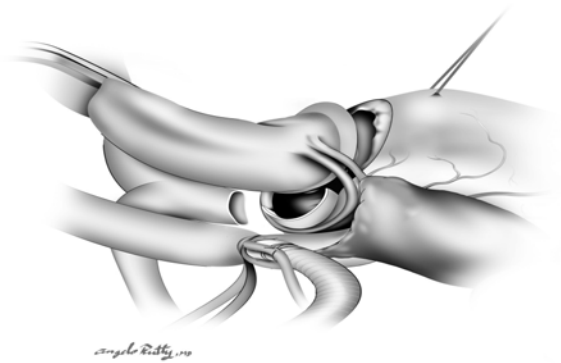
TGA

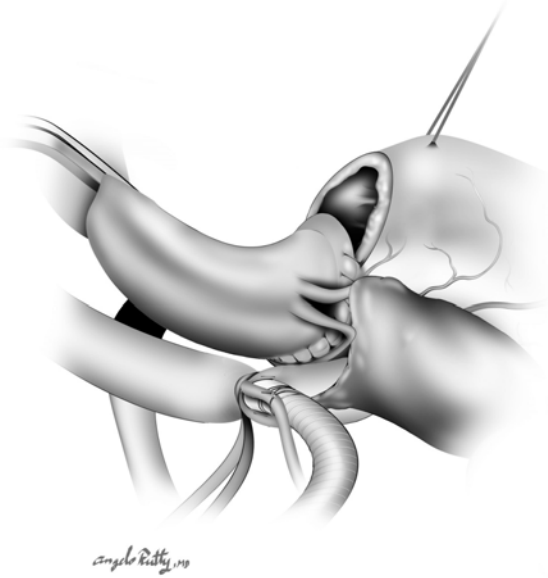


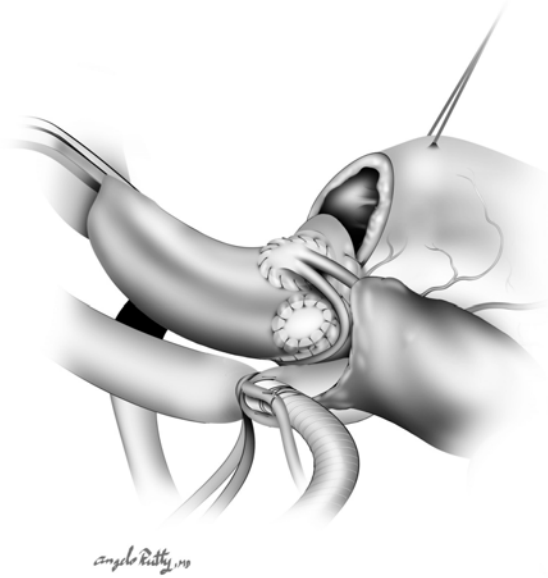
DORV

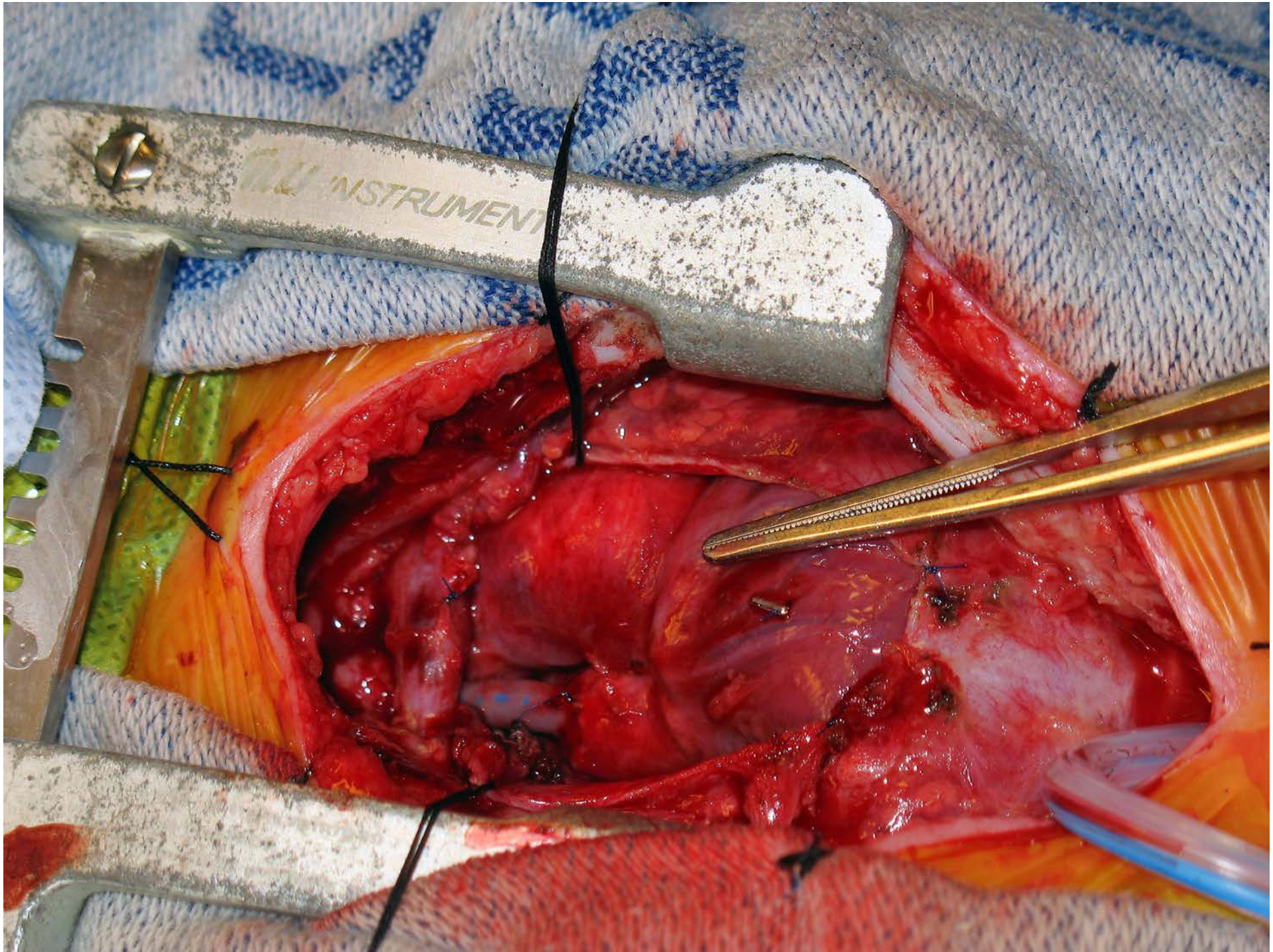




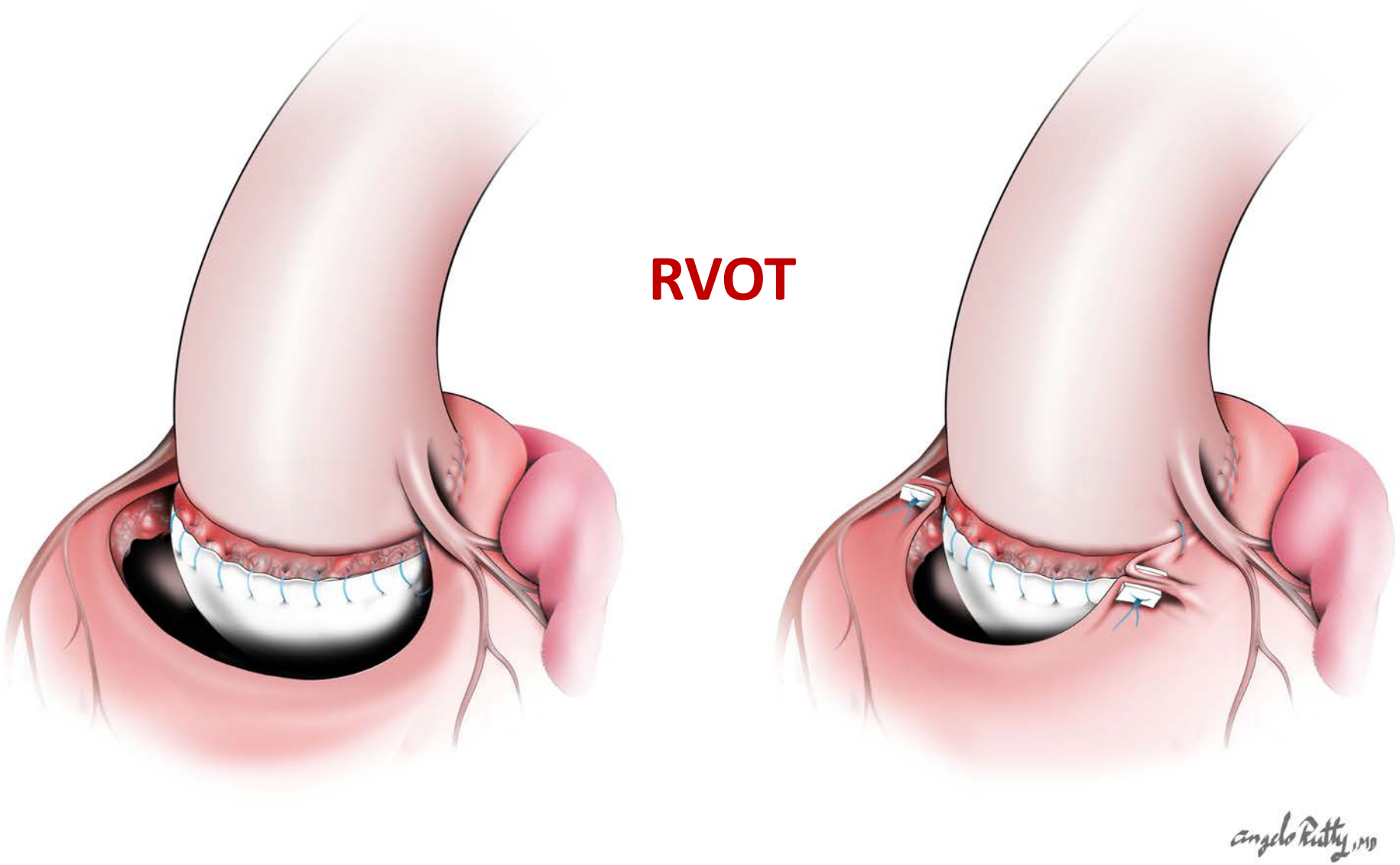




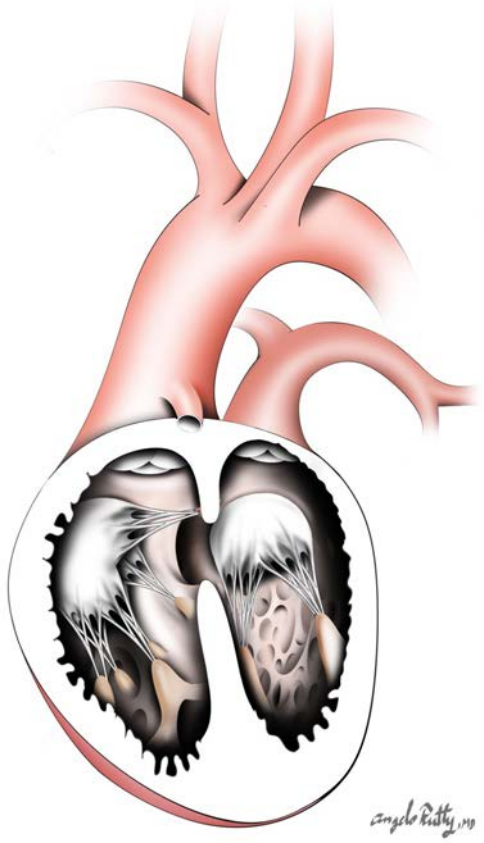


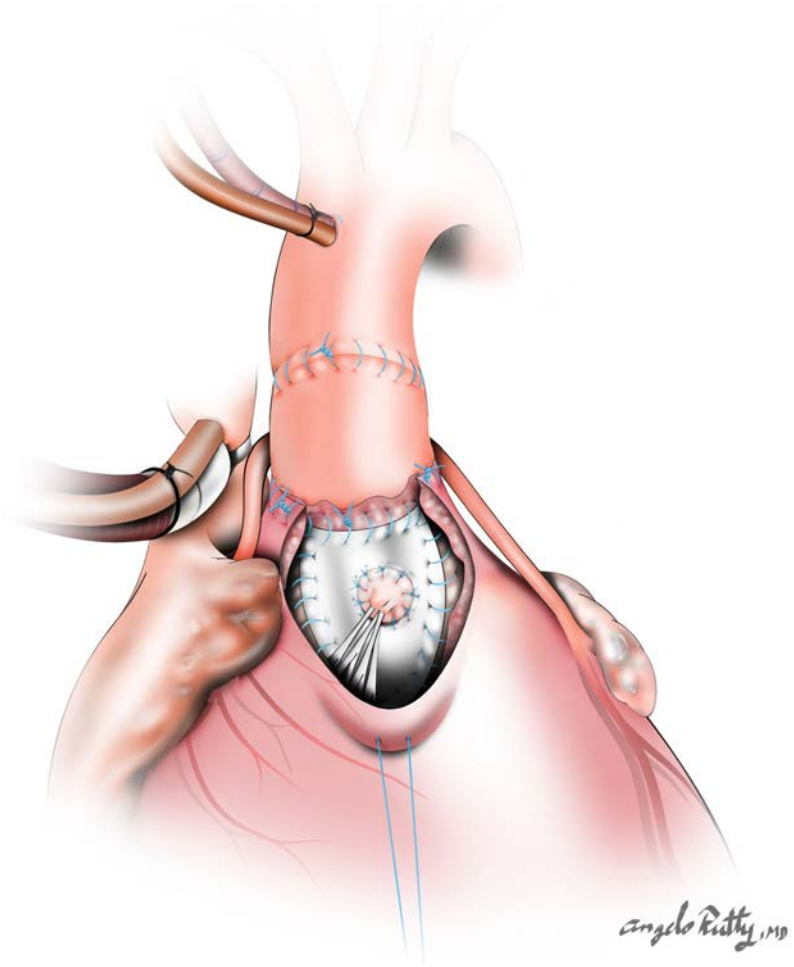


RVOT

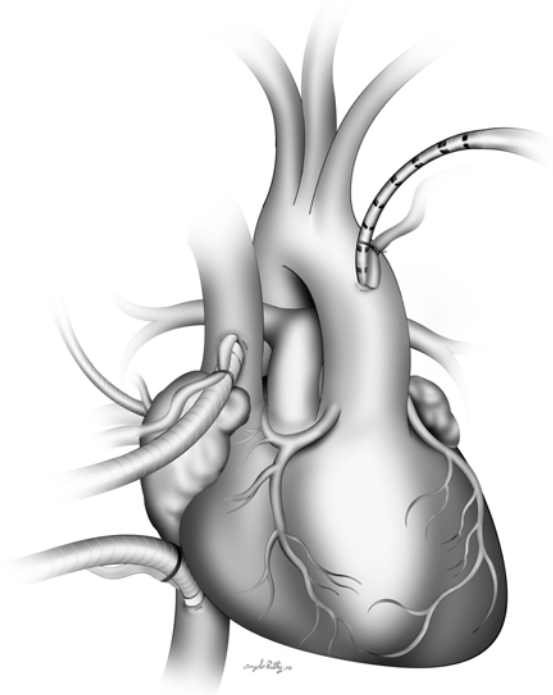


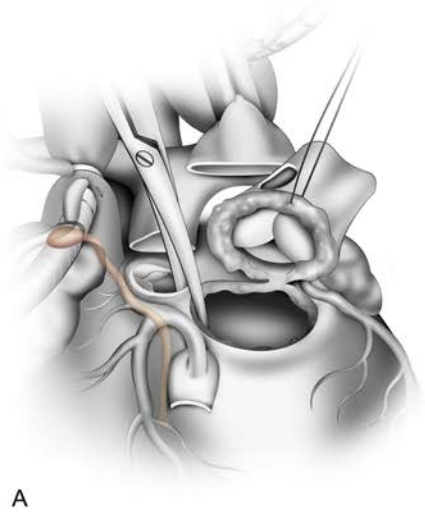
Abnormal AVV attachments



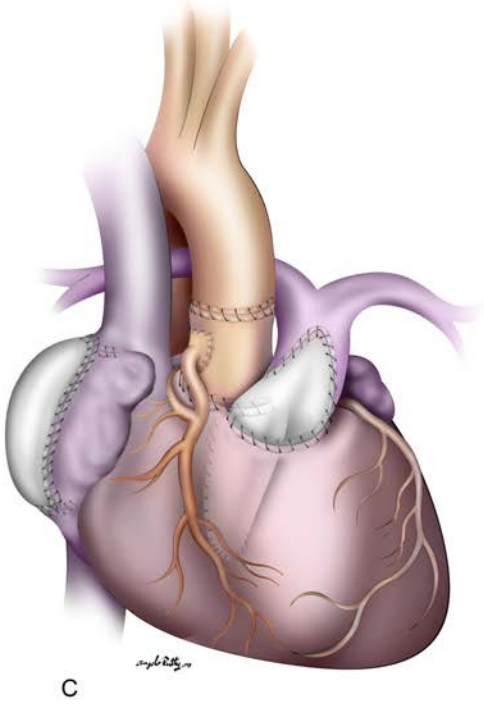


CC-TGA

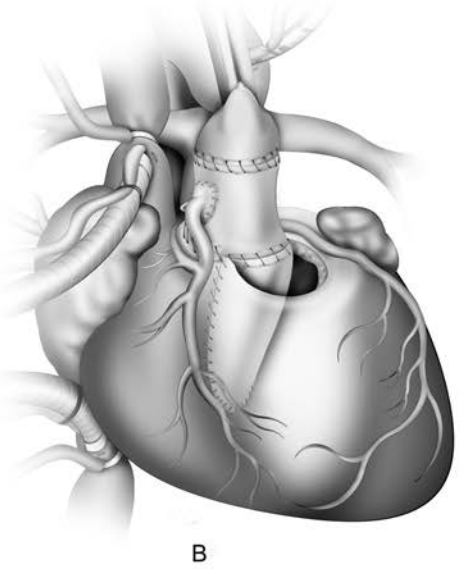




A

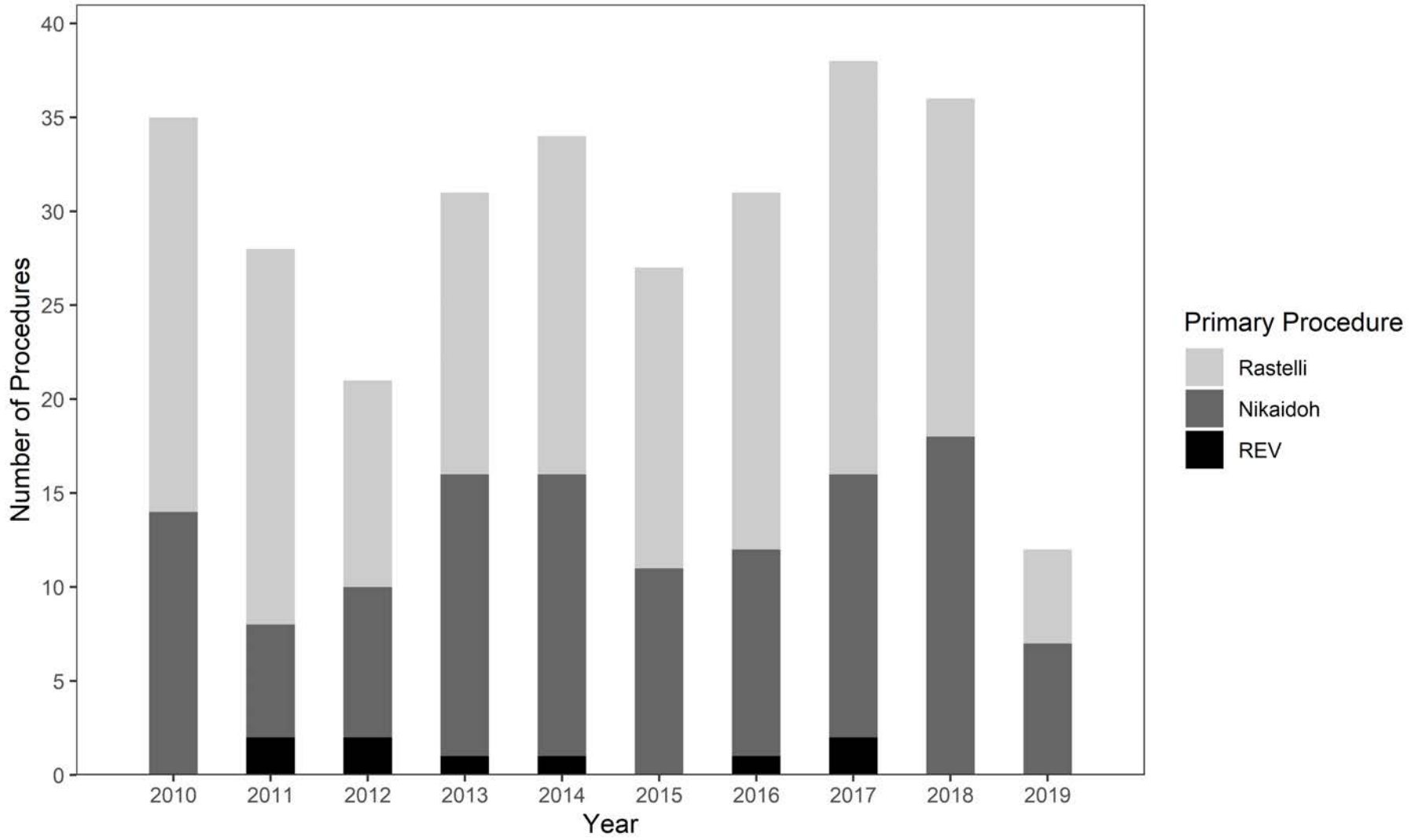


C



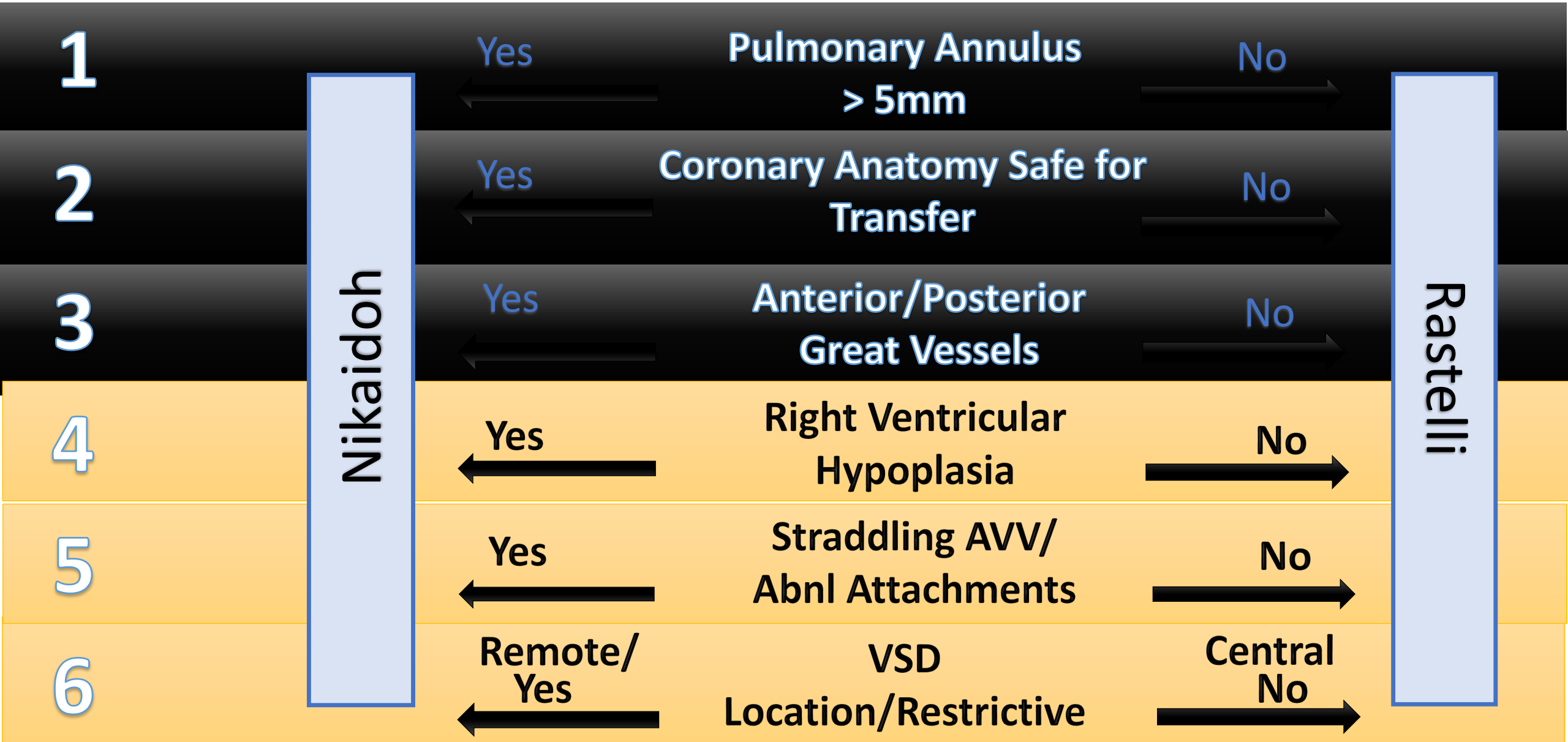
B

National Landscape

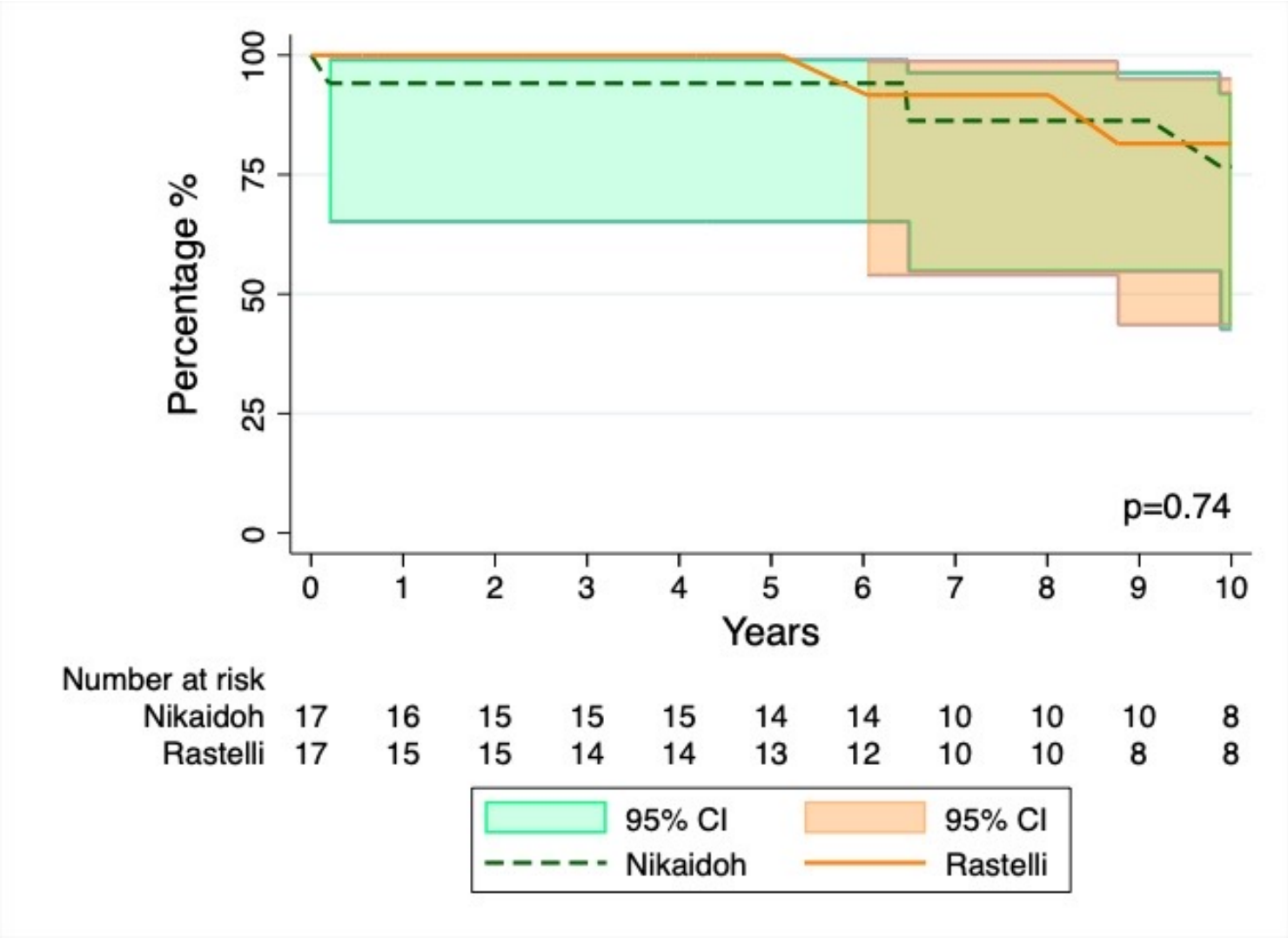


Seese et al. The Utilization and Outcomes of the Nikaidoh, Rastelli, and REV Procedures: A Society of Thoracic Surgeons Database Study. Ann Thoracic Surgery, 2021.

Operative Decision-Making Algorithm for Complex Transposition with LVOTO



Competing Risks Freedom from Death and Reoperation



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