EDITORIAL

Reflections about Repair of Transposition of the Great Arteries

Reflexiones sobre reparación en la transposición de los grandes vasos

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The study by Villalba et al. (1) poses a vital challenge, as transposition of the great arteries (TGA) has elevated mortality that reaches 90% per year in untreated patients. In this sense, the 76 patients undergoing surgery with the Rastelli operation, the REV procedure (*Lecompte's reparation a l´etage ventriculaire*) and the Nikaidoh procedure and carefully analyzed with a mean follow-up of 9.9 years represent a good parameter for future decision-making. However, two limiting observations should be made, as these patients correspond to a long period from 1991 to 2015, during which there were many additional contributions to medical and surgical treatment that prevent from making absolute connotations in the analysis. In fact, the authors themselves state that mortality decreased during the second period. Moreover, the fact that the Rastelli operation was performed in 60 patients, the Nikaidoh procedure in 13 and the REV procedure in 3, limits the comparative analysis of these therapeutic approaches. Obviously, as the authors express, these procedures repair the defects but do not correct them, producing complications which may need reinterventions increasing morbidity and mortality.

The Rastelli operation (2) was first described in the Mayo Clinic in 1969 and for many decades was the technique most commonly used for repairing TGA associated with left ventricular outflow tract obstruction (LVOTO) with ventricular septal defect (VSD). However, several publications have reported significant long-term morbidity and mortality as a consequence of mid and long-term left-sided and right-sided heart obstruction. Therefore, long-term survival is only of 48% at 20 years. This situation demands a better selection of patients ensuring a precise anatomic diagnosis, immediate repair, avoiding extended periods of time with systemic-to-pulmonary artery shunts, routine enlargement of the VSD by resection of the conal septum, and the use of new valved conduits (pericardial tubes or cryopreserved decellularized homografts) in the pulmonary position. For some authors, the Rastelli operation provides excellent results in selected patients with TGA with VSD and LVOTO. (3)

The analysis of this situation has led to the development of variants to the conventional Rastelli operation, as *Lecompte's reparation a l´etage ventriculaire* (REV procedure) in 1982 (4) and the Nikaidoh procedure (1984). (5)

The Nikaidoh procedure consists on the aortic traslocation and reconstruction of both ventricular outlets and is a possibility for the treatment of patients with diagnosis of TGA with VSD and pulmonary stenosis, including hypoplastic pulmonary annulus. The technique was initially published in two cases. Although the authors do not show differences in the durability of the right ventricle-pulmonary artery (RV-PA) conduit with this technique, the conduit is less exposed to sternal compression due to the aortic traslocation to a posterior position. In this way, the reconstruction is more anatomical with better intracardiac circulation, avoiding the reduction of the right ventricular chamber. An interesting contribution of the authors of this study is that "dysfunction of the RV-PA conduit responds not only to anatomical factors but also to the natural history of the homografts". The Nikaidoh procedure is a feasible technique in patients with coronary artery anomalies preventing a right ventriculotomy, in those with restrictive VSD or overriding of the atrioventricular valves with hypoplastic right ventricle syndrome.

As we have previously mentioned, the REV (Lecompte) procedure has been successfully performed in patients with contraindications for the Rastelli operation. In addition, connection of the right ventricle to the pulmonary artery has the limitation of homografts and xenograft durability has been questioned, particularly in small children. However, VSD size and an abnormal attachment of the tricuspid valve chords do not represent limiting factors in this procedure.

There are options according to the level and anatomic characteristics of the complex forms of LVOTO. Patients with LVOTO and unresectable moderate to

REV ARGENT CARDIOL 2017;85:201-202. http://dx.doi.org/10.7775/rac.v85.i3.11139
SEE RELATED ARTICLE: Rev Argent Cardiol 2017;85:232-239. http://dx.doi.org/10.7775/rac.v85.i3.10945

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severe mechanical obstruction can undergo a non–arterial switch operation repair (Rastelli, Lecompte or Nikaidoh procedures). However, there are no rules to select the different surgical options.

Complex TGA, with VSD and LVOTO (TGA with pulmonary stenosis and VSD) is a congenital defect with a compromised resolution and, thus, the results are not the best. The study by Villalba et al. (1) evaluating the long-term complications of the different repair techniques, Rastelli, Lecompte and Nikaidoh procedures after a mean follow-up of 9.9 years, and despite the disparity in the number of techniques used to evaluate effectiveness, represents a horizon with good survival to evaluate the risks and focus on the therapeutic efforts towards the best available option.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/Supplementary material).

REFERENCES

1. Villalba CN, Mouratian M, Lafuente MV, Dilascio M, Tasat L, Saad AK et al. Biventricular Repair in Patients with Transposition of the Great Arteries, Ventricular Septal Defect and Pulmonary Stenosis: Rastelli, Nikaidoh or REV Procedures? Rev Argent Cardiol 2017;85:232-9.

2. Rastelli GC, Wallace RB, Ongley PA. 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. Circulation 1969;39:83-95.

3. Kreutzer C, De Vive J, Oppido G, Kreutzer J, Gauvreau K, Freed M, et al. Twenty-five-year experience with Rastelli repair for transposition of the great arteries. J Thorac Cardiovasc Surg 2000;120:211-23.

4. Lecompte Y, Bourlon K. Anatomic repair for complex transposition. New York: Springer-Verlag; 1992.

5. Nikaidoh H. Aortic translocation and biventricular outflow tract reconstruction. J Thorac Cardiovasc Surg 1984;88:365-72.