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Editorial Comment

Surgical repair of tetralogy of Fallot

Hiromi Kurosawa

IN THIS ISSUE OF THE JOURNAL, WE PUBLISH TWO accounts of surgical repair of tetralogy of Fallot, both of which report outstanding results.[1,2] As is discussed in both papers, the appropriate age for total repair, the need for a so-called "transannular" patch placed across the anatomic junction between the infundibular musculature and the pulmonary trunk (in reality a transjunctional patch), and the best approach for repair remain contentious issues. To put the issue into perspective, in our own centre we have performed repair for 228 consecutive cases using the so-called "conotruncal", or outlet, approach.[3] This involves closing the ventricular septal defect with a patch sutured either to the membranous flap (#1 suture in Fig. 1) or to a posteroinferior muscle bar, if present, and not using the septal leaflet of the tricuspid valve. We also insert a patch across the ventriculo-pulmonary junction, of which the subpulmonary part is short, made of xenopericardium, or else use a polytetrafluorethylene monocusp.[4] Among 228 cases, 11% were under 12 months of age, 33% were between one and two years old, 28% were three to four years old, and 28% were over four years old. Of our most recent 100 cases, 60% were under the age of two years. Twenty cases had coexisting pulmonary atresia rather than pulmonary stenosis. There was no incidence of hospital death. Late death has occurred in two cases. The first death was due to pneumonia, which occurred after reoperation for repair of residual partially anomalous pulmonary venous connection. The second patient had suffered left heart failure caused by injury to a coronary artery during division of pericardial adhesions, and died one year after surgery. All 228 patients showed sinus rhythm postoperatively, without any incidence of heart block. No patient had a significant residual ventricular septal defect. A few patients who had previously undergone palliative surgery required plasty of the pulmonary arterial pathways. All survivors have had a good postoperative course, and almost all are now in class I of the criterions for assessment proposed by the New York Heart Association. Although we certainly agree with those who recommend an age below two years as the preferable period for total correction, we have reservations about performing surgery in the first month of life. For those cases with pulmonary atresia requiring urgent treatment in this period, we think it better first to undertake palliative surgery, delaying total correction to the period between one and two years of age, ideally without using an extracardiac conduit. Our preference is to use a transjunctional patch, incorporating a wide monocusp valve. We have found that this approach provides a good postoperative course and high quality of life.

A short ventriculotomy crossing the ventriculo-pulmonary junction provides a suitable view for appropriate resection of infundibular muscle, and permits accurate closure of the ventricular septal defect[5] (Fig. 1). A "pure" ventriculotomy must be longer than one which crosses the ventriculo-pulmonary junction. The length of 2.83 cm, cited in the report of Kaushal and colleagues,[2] might be almost half of the overall right ventricular length.[6] The incision which crosses the ventriculo-pulmonary junction in our so-called conotruncal repair is less the one-third of the right ventricular length.[3] The relatively extensive ventriculotomy might be one reason for the global dyskinesis of the right ventricle reported by Kaushal and colleagues.[2] Those undergoing repair in this fashion could also be repaired by approaching through the right atrium and tricuspid valve. Careful resection of infundibular muscle, and precise placement of sutures (particularly #5 and #6 in Fig. 1), however, seem to be more difficult to accomplish by this transatrial approach without

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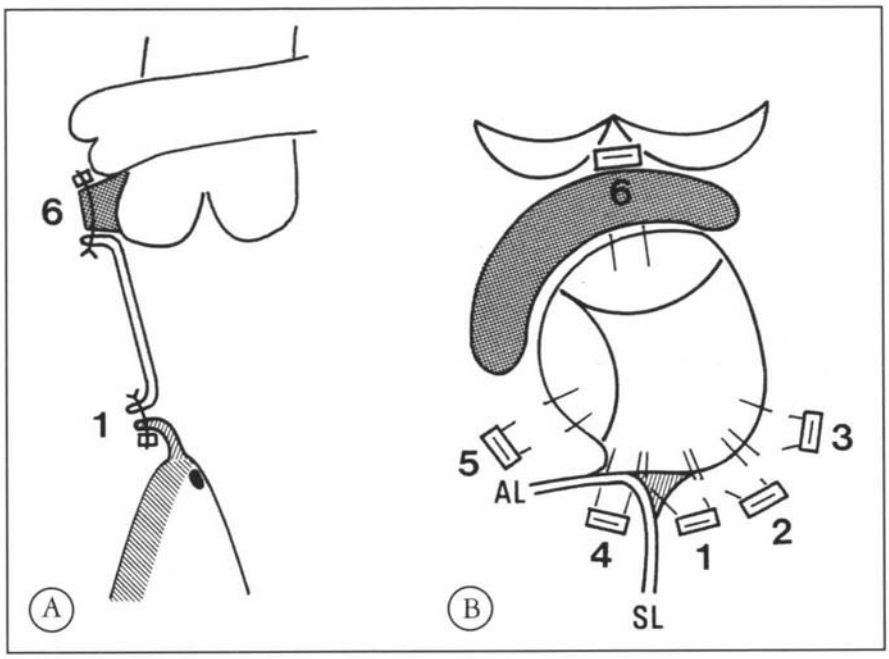

The figures show the method of closure of the ventricular septal defect in the so-called conotruncal repair. A) shows the sectional view, while B) shows the surgeon's view of the right ventricular margin of the defect. AL, SL - anterosuperior and septal leaflets of the tricuspid valve. The stippled area shows the outlet septum, while the cross-hatched area is the membranous flap. The dark dot in A shows the likely site of the atrioventricular conduction axis.

producing damage to the tricuspid valve, particularly in young patients. The membranous flap was found in almost all cases with perimembranous defects seen in our surgical series, although the incidence of the flap has been reported to be somewhat lower in caucasian hearts.[7] In cases without a membranous flap, the suture indicated as #1 in Fig. 1 can be excluded. The most important point during surgery is to avoid all features which might increase the volume load on the right ventricle, such as heart block, a residual ventricular septal defect, fixation of the septal leaflet of the tricuspid valve, pulmonary and tricuspid regurgitation, excessive resection of infundibular muscle, and insertion of an outflow patch which is too extensive.

As for palliation, the construction of a Blalock-Taussig shunt rarely causes pulmonary arterial distortion if it is anastomosed to the right pulmonary artery near to the bifurcation. As the western proverb states, there are many ways to skin a cat! The bottom line is to choose a technique which produces satisfactory and reproducible results.

Department of Cardiovascular Surgery
Jikei University School of Medicine
3-25-8 Nishi-Shinbashi, Minato-ku
Tokyo 105
Japan

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