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Double Patch Closure of VSD with Elevated Pulmonary Artery Pressure

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Background

A VSD is defined as an opening or hole in the inter vevtricular septum of the heart.

Isolated VSDs occur in approximately 2 of every 1000 live births and constitute over 20 percent of all congenital heart defect [(1)]

The diagnosis and surgical treatment of children with a large VSD is frequently delayed in many countries throughout the world [(2)].

Closure of a large ventricular septal defect (VSD) in children with elevated pulmonary artery pressure is associated with significant morbidity and mortality.[(3)] Pulmonary hypertensive episodes continue to be a major cause of postoperative morbidity and mortality. We designed a fenestrated flap valve double VSD patch in an effort to decrease the morbidity and mortality associated with the closure of a large VSD with elevated pulmonary arterial pressure.[(4)]

Methods

Twenty three patients (mean age, 6 years) with a large VSD and elevated pulmonary vascular resistance ,14 patients were male and 9 patients were female , underwent double patch VSD closure using moderately hypothermic cardiopulmonary bypass and cardioplegic arrest. The routine VSD patch was fenestrated (half of calculated aortic size) and on the left ventricular side of the patch, a second, smaller patch was attached to the fenestration along its superior margin before closure of the VSD[(5)] . fig (1&2)
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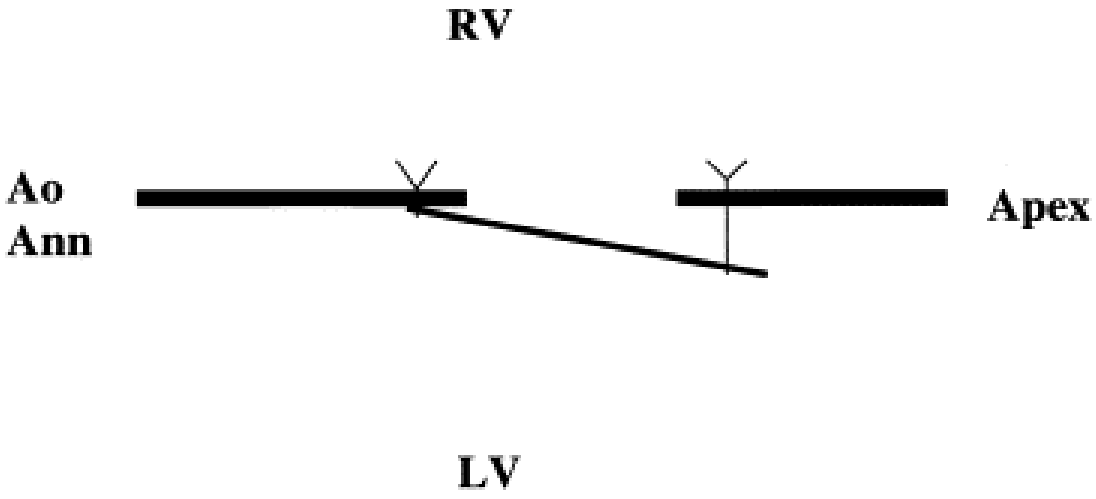

Figure (1) Lateral view of flap valve ventricular septal defect (*VSD*) patch. (*Ao Ann* = aortic annulus; *LV* = left ventricle; *RV* = right ventricle.)

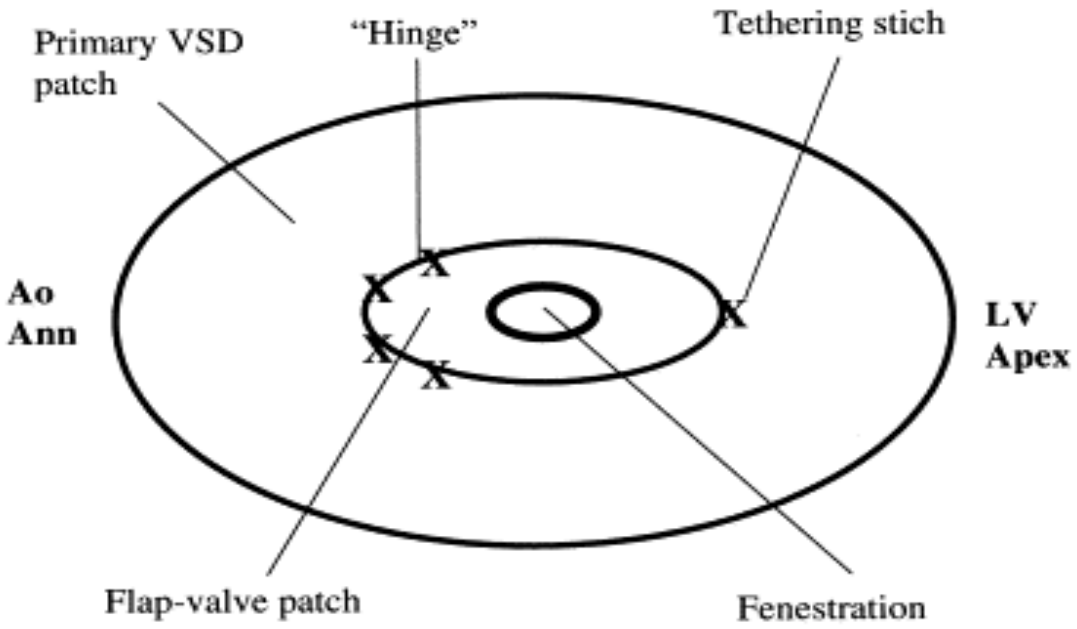

Figure (2) Frontal view of flap valve ventricular septal defect (*VSD*) patch. (*Ao Ann* = aortic annulus; *LV* = left ventricle.)

Results

All children survived operation and were weaned from inotropic agents and ventilator support within 12 hours postoperatively. Postoperative pulmonary artery pressures were significantly lower than preoperative values.

Discussion

Preoperative data

The mean preoperative room air arterial saturation obtained at cardiac catheterization was 89% ± 5%. The preoperative systolic pulmonary artery pressure was 105 ± 16 mm Hg. Pulmonary artery to systemic artery systolic pressure ratio was 0.93 ± 0.09

Postoperative data

The pulmonary artery systolic pressure after repair was 42 ± 14 mm Hg with a corresponding systemic arterial systolic pressure of 95 ± 8 mm Hg for a ratio of 0.44 ± 0.12:1 Postoperative saturations on discharge from the hospital were 98% ± 2% (not significantly different from preoperative saturations), and saturations obtained at pediatric clinic follow-up were 96% ± 2%.

Conclusions

Closure of a large VSD in children with elevated pulmonary vascular resistance can be performed with low morbidity and mortality when a flap valve double VSD patch is used, as the surgical mortality rate for direct VSD closure can reach up to 13.5%[(6)] .

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