Long-term follow-up 10 years after catheter closure of atrial septal defect in 241 children

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Objectives: After the first percutaneous ASD closure (1975) and material improvement with the Lock Clamshell® in 1985 and Amplatzer® devices in 1995, several teams published results, limited to small numbers of patients and/or short-term follow-up (FU). This study analyzed effectiveness and long-term FU after ASD, PFO or fenestration cath closure in a large number of children in a single institution.

Methods: This retrospective study included 258 children after attempted cath closure from 1/2000 to 4/2011. Seventeen children have ultimately been operated. Analysis focused on 241 children who underwent effective percutaneous closure. Patients were divided in 3 groups: ASD (203 patients), PFO (10 patients) and fenestration post-Fontan repair (28 patients).

Results: Device closure was effective in 241 patients (93.4 %), 17 ASD patients were operated (ASD to large for device closure in 15 and device embolization in 2). Mean age at closure was 8.2+/−4.3 yrs (range 0.5-17.8 years) and weight 29+/−18 kg (range 3.2-108 kg). Major complications observed in 5 patients (2%) were 3 device embolization (2 treated by surgery and 1 device recovered by cath), 1 pericardial effusion requiring drainage, 1 stroke after Fontan fenestration closure. Minor complications consisted mainly of transient arrhythmias (5.4%) with spontaneous resolution or under medication. The major strength of this study was a complete FU obtained in 98.8 % of the patients (mean 5.5+/−3.3 years, range: 0.1-12.2 years) showing no further complication. After ASD closure, the number of symptomatic patients (exercise intolerance, growth delay, recurrent respiratory infections) diminished from 47% to 13%. Echo showed a complete occlusion in 74.3% of the patients at hospital discharge, and 93.5 % at late follow-up (ASD 94%, PFO 100%, Fenestration 86%).

Conclusions: This study is one of the few with extended FU and a large number of pediatric patients. Failure, success and complications rates were similar to those found in the literature and compared favorably with surgical closure. Cath closure was effective with disappearance of clinical symptoms and the absence of significant residual shunt on echo. Major procedural complications were rare and long-term FU revealed no complications.