Intraoperative Treatment of Arrhythmias in Adult Patients With Congenital Heart Disease

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Introduction. Supraventricular and ventricular arrhythmias are a major cause of morbidity and mortality in adult patients with congenital heart disease (CHD). Intraoperative ablation offers an alternative for patients that failed ablation procedures or are requiring concomitant surgical intervention. We present the results of our experience with the surgical treatment of arrhythmias in adults with CHD undergoing elective cardiac surgery.

Methods. Between September 2002 and December 2012, 90 consecutive patients with CHD, mean age of 39 years (range 16-72), underwent intraoperative ablation during cardiac surgery for pulmonary implantation (37/90, 41.1%), atrial septal defect closure (22/90, 24.4%), Fontan procedure (18/90, 20%), partial AV canal (4/90, 4.4%), Ebstein or tricuspid valve dysplasia (4/90, 4.4%), scimitar syndrome (2/90, 2.2%), cor triatriatum (1/90, 1.1%), congenitally corrected TGA (1/90, 1.1%), or mitral valve regurgitation (1/90, 1.1%). Significant clinical predictors of arrhythmia recurrence were determined by univariate analysis.

Results. In the study period we performed 44 right-sided Maze procedures, 27 Cox-Maze III procedures and 19 right ventricular ablations. The hospital mortality rate was 5.5% (5 patients) from causes unrelated to ablation. In 85 survivors, the ablation was effective immediately. Over an average follow-up period of 58 months (2-96 months), 3 (3.4%) late deaths occurred: 2 after a Cox-Maze III and 1 after a right-sided Maze procedure. Arrhythmias recurred in 9 (21%) patients after right-sided Maze ablation, 6 (22%) patients after Cox-Maze III procedure, and 7 (37%) patients after right ventricular ablation. Fifteen patients were controlled with medical therapy, 4 patients underwent catheter ablation of the arrhythmia, 1 patient required a permanent pacemaker, and 2 patients had an intracardiac defibrillator implanted. Univariate analysis demonstrated that duration of arrhythmia prior to surgery (p=0.003), right-sided Maze ablation for atrial fibrillation (p=0.001), and atrial fibrillation in patients with tetralogy of Fallot (p=0.001) are risk factor for arrhythmia recurrence.

Conclusions. Intraoperative treatment of unresponsive arrhythmia in adults with CHD is a safe and effective procedure. Freedom from arrhythmias recurrence is 74% after 8 years of follow-up. This procedure should be taken into consideration when transcatheter ablation fails or when elective cardiac surgery is planned.