



Restoration of Cardiac Activity During Radical Correction in Children with Septal Heart Defects

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ABSTRACT

Purpose of the study: to study the restoration of cardiac activity after radical correction in children with septal heart defects.

Materials and research methods: An analysis was carried out of the metabolic and functional state of the heart and coronary vessels, as well as the clinical characteristics of 69 patients with septal heart defects in the department of cardiovascular surgery in patients of the Regional Medical Center of the Samarkand region. Depending on cardioplegic protection, patients were divided into two groups: in group I (n = 32) antegrade intracellular crystalloid cardioplegia. In Group II (n = 37) was treated with antegrade intermittent crystalloid extracellular cardioplegia.

Results: In group I (n = 32), the recovery of cardiac activity was as follows. Option 1 was observed in 29 (90.6%) patients, recovery options 2 and 5 were absent, and 1 (3.1%) patient underwent option 3. Option 4 was observed in 2 (6.3%) patients. In the second group (n = 37), restoration of cardiac activity according to option 1 was noted in 31 (83.7%) patients, according to options 2 (temporary cardiac pacing) and 3, 5, 1 (2.7%) patient and 4 recovery option was noted in 3 (8.2%) patients.

Conclusions: Thus, transient atrioventricular block was the predominant mechanism of cardiac recovery. In both groups, in the early reperfusion period, by the time the extracorporeal bypass was completed, there were no signs of myocardial ischemia in the form of ST segment displacement by more than 1 mm. in one or more ECG leads.

Keywords: *Congenital heart disease, myocardium protection, cardioplegy, Custidol, pediatric cardiac surgery.*

Introduction

One of the indirect but important indicators of the effectiveness of myocardial protection during cardiac surgery with artificial circulation is the nature of the restoration of cardiac activity after removal of the clamp from the aorta and the resumption of coronary blood flow. Most comparative studies on cardioplegic protection consider the absence of ventricular fibrillation during the reperfusion period as a criterion for its adequacy [1, 2, 3, 4, 5].

Purpose of the study: to study the restoration of cardiac activity after radical correction in children with septal heart defects.

Materials and research methods:

69 patients with septal heart defects were examined in the Department of Cardiovascular Surgery in patients of the Regional Medical Center of the Samarkand region for the period from 2020 to 2021. There were 33 (47.8%) females and 36 (52.2%) males. At the time of admission to the hospital, the average age of the patients was 2.1±1.3 years, body weight -10.8±2.1 kg, height -81.4±7.9 cm. The average value of arterial blood oxygen saturation was 91 ±4%. The hemoglobin level on admission averaged 133.4±24.6 g/l.

The metabolic and functional state of the heart and coronary vessels, as well as the clinical characteristics of the patients, were analyzed.

According to echocardiography, an ejection fraction of more than 65% was recorded in 37 (53.6%) patients, less than 65% - in 32 (46.4%) people.

Depending on cardioplegic protection, patients were divided into two groups:

- Group I (n = 32) - where antegrade intracellular crystalloid was used cardioplegia "Custidol" with a temperature of 5-8 °C. The heart is perfused for 6-8 minutes with the height of the perfusion tank above the heart level initially being about 140 cm = 100 mmHg. at the rate of 40 ml/kg;

- Group II (n = 37) - where antegrade intermittent crystalloid extracellular cardioplegia was used with a temperature of 5-8 °C.

Study results:

B In group I (n =32), the recovery of cardiac activity was as follows. Option 1 was observed in 29 (90.6%) patients, recovery options 2 and 5 were absent, and 1 (3.1%) patient underwent option 3. Option 4 was observed in 2 (6.3%) patients.

In the second group (n = 37), restoration of cardiac activity according to option 1 was noted in 31 (83.7%) patients, according to options 2 (temporary cardiac pacing) and 3, 5, 1 (2.7%) patient and 4 recovery option was noted in 3 (8.2%) patients.

The duration of the period of myocardial ischemia in group I was 25.4±6.12 minutes, in group II it was 28.1±7.17 minutes. The ratio to CB time in group I was 1.88±0.17, in group II it was 1.9±0.13 (p>0.05).

The options for restoring cardiac activity were as follows:

1. asystole – blockade – sinus rhythm (A-B -C);
2. asystole - blockade - cardiac pacing (temporary or permanent) (A-B -EX);
3. asystole – ventricular fibrillation – spontaneous restoration of sinus rhythm (A-F-S);
4. asystole – ventricular fibrillation – electrical defibrillation – sinus rhythm (A-F-EDF-S).
5. asystole – ventricular fibrillation – repeated electrical defibrillation – sinus rhythm (A-F- repet.EDF -C).

Conclusions:

Thus, transient atrioventricular block was the predominant mechanism of cardiac recovery. In one case in the second group, a temporary pacemaker was required due to the development of 2nd degree atrioventricular block in the patient, which was turned off 7 hours later in the intensive care unit after restoration of sinus rhythm. Due to the low myocardial contractility in the second group, two patients required repeated use of electrical defibrillation to restore their own rhythm .

In both groups, in the early reperfusion period, by the time the extracorporeal bypass was completed, there were no signs of myocardial ischemia in the form of ST segment displacement by more than 1 mm. in one or more ECG leads.

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