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Development of the congenital heart disease surgeries in Kyrgyzstan

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Abstract

This article describes development of congenital heart disease surgery in Kyrgyzstan.

Key words: congenital heart disease, cardiac surgery procedures

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The history of development of congenital heart diseases surgery (CHD) in Kyrgyzstan and overall in cardiac surgery is associated with the name of academician Isa Konoevich Akhunbaev. The first CHD operation was patent ductus arteriosus (PDA) ligation performed by the academician in 1962 (Table 1). In addition, the first cardiac operation using cardiac-pulmonary bypass (CPB) was CHD surgery when atrial septal defect repair was conducted by academician V.I.Burakovsky from the Academy of Medical Sciences of the Soviet Union (AMS of USSR) together with Isa Akhunbaev from the Academy of Sciences of the Kyrgyz Socialist Republic (AS of KSR) in 1964. From 1964 to 1975 Akhunbayev together with his students conducted 34 CHD surgeries on CPB and 10 operations for valvular surgery.

Table 1. Initially conducted operations

1959	Closed mitral commissurotomy (finger)	Akhunbaev I.K.
1962	PDA ligation	Akhunbaev I.K.
1964	Pericardectomy	Akhunbaev I.K.
1964	Cardiac catheterization	Savranova T.D.
1964	ASD repair using CPB	Burakovsky V.I.
1971	Waterston-Cooley anastomosis	Akhunbaev I.K.
1972	Closed mitral commissurotomy (instrumental)	Akhunbaev I.K.
1972	Pulmonary artery valvular repair	Akhunbaev I.K.
1973	VSD repair	Akhunbaev I.K.
1973	ASD repair	Akhunbaev I.K.
1973	Mitral valve replacement (MVR)	Akhunbaev I.K.
1974	MVR+ tricuspid valve repair	Akhunbaev I.K.
1975	Pacemaker implantation	Djoshibaev S.D.

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The cardiac surgery department with 50 beds was established in 1976 at the Republican Clinical Hospital (RCH). From 1975 to 1985 the team of the Republican Center of Cardiac Surgery managed to perform 370 operations using CPB for various forms of CHD. Due to insufficiency of appropriate equipment and limited diagnostics, only children with CHD weighing more than 15 kg were subjected to surgical treatment under CPB conditions.

In 1985 Department of Cardiac Surgery of the RCH was transferred to the Scientific Research Institute of Cardiology (SRI of Cardiology, currently: National Center of Cardiology and Internal medicine) by the decree of the Ministry of Health. The specialized Department of Congenital Heart Disease Surgery with 20 beds was established in 1986. Enhancement of diagnostic capabilities, surgical techniques and postoperative care between 1986 to 1990 led to the improvement of surgical interventions both in quality and quantity. In terms of the quantity and volume of surgical interventions for CHD between 1986 to 1990 the Department of Congenital Heart Disease Surgery (#2 department of Cardiac Surgery) of SRI Cardiology was ranked as one of the best departments in the Soviet Union. In 2004, Cardiac Surgical Care was separated from the National Center of Cardiology and Internal Medicine, and the Scientific-Research Institute for Heart Surgery and Organ Transplantation (SRIHSOT) was established by decree of the Government. On the basis of the newly established institute the Department of Surgery for Congenital Heart Diseases (DSCHD) was established with 20 beds.

From 2000 development of pediatric cardiac surgery boosted: surgeons were trained in internships, in specializations abroad and in our country performing various operations for CHD. As a result, we can see decrease in postoperative mortality, increase in quantity and volume of operations and an active implementation of Western technology in the domestic cardiac surgery (Fig. 1).

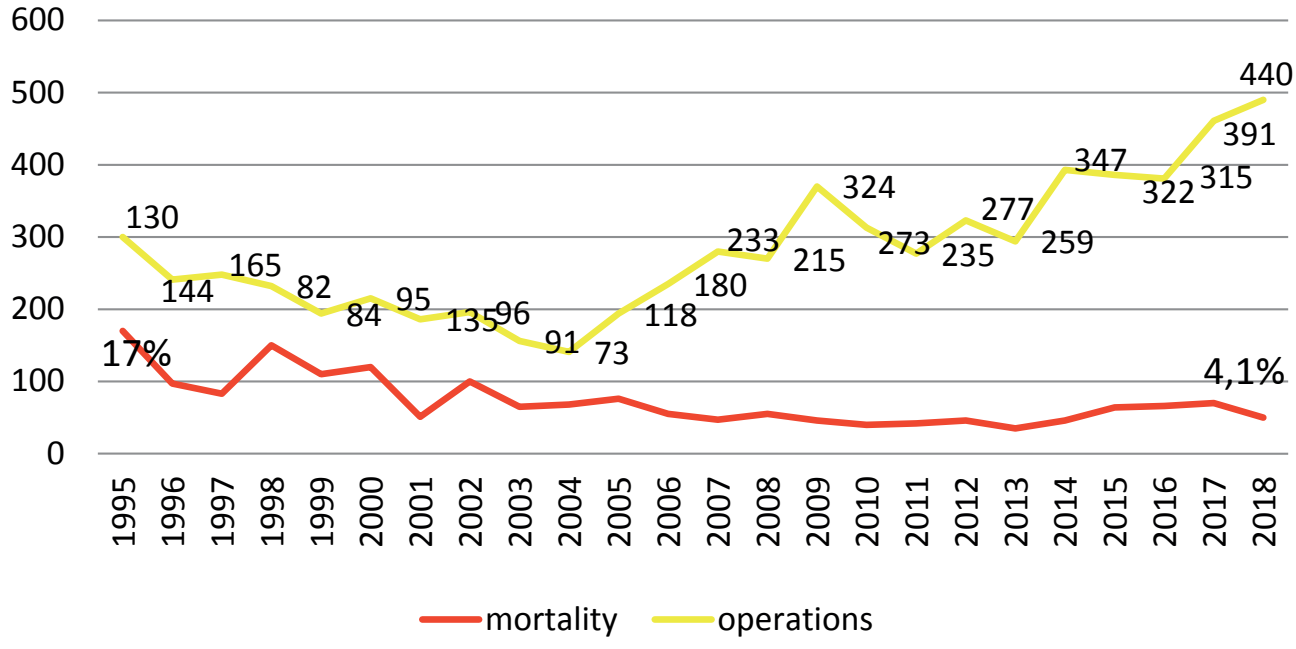

Figure 1. Dynamics of increase in the quantity of operations and reduction of mortality

As can be seen from the presented diagram below, the dynamic growth of the total number of operations is accompanied by an increase in the number of patients with complex congenital heart defects and children with lower weight.

Surgery of complex CHD and children under a year and neonates in our center began to develop in 2006. After the training of operational personnel and obtaining of appropriate equipment and consumables, surgery for CHD initialized in 2011 for children under a year and with a lower weight (Fig. 2).

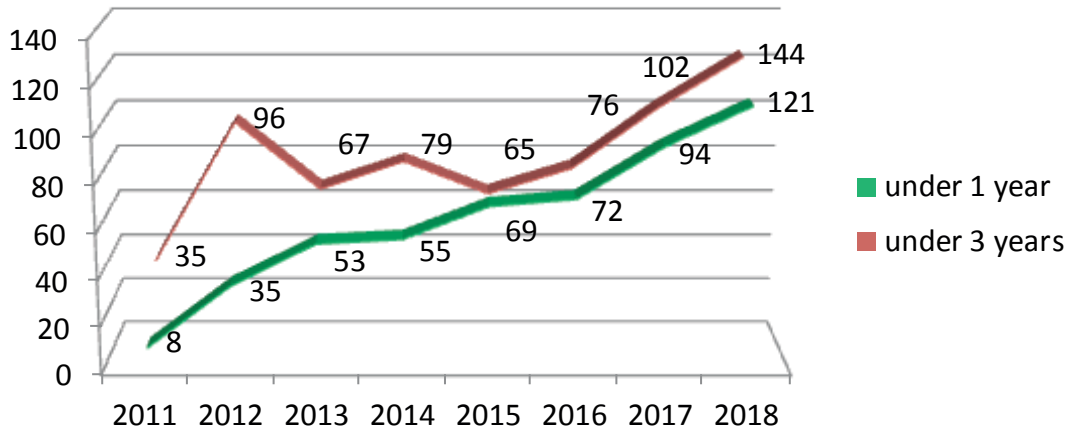

Figure 2. Dynamics of the annual quantity of operations in children of younger age and neonates

From year to year, the amount of surgical care provided to newborns with CHD increases. Surgical interventions for complex congenital heart defects are being developed. Methods for the pre-and postoperative management of patients with complicated high pulmonary hypertension were developed and implemented.

Currently in DSCHD more than 20 types of operations for complex CHD surgeries are being introduced into clinical practice (Table 2). Moreover, operations are carried out annually with foreign colleagues. The qualification of the staff in operating children with a lower weight is increasing.

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Table 2. New types of operations

1	DORV radical correction	2003
2	RV-PA conduit implantation in ToF with ALCAPA (Rastelli operation)	2003
3	RVOT reconstruction without VSD closure	2003
4	Off-pump Glenn operation	2005
5	BCPS (bilateral cava-pulmonary shunting)	2006
6	Arterial switch operation	2006
7	Radical correction of I-II Type PA with VSD	2006
8	Transannular PA repair with monoleaflet patch from Glisson capsule	2006
9	Mustard operation	2007
10	Rastelli operation in TGA with PS	2007
11	Muller's procedure	2007
12	Neonatal cardiac surgery	2007
13	One and half ventricle correction in Ebstein's anomaly and hypoplastic RV	2007
14	Radical correction of ToF with left pulmonary artery agenesia	2008
15	Pulmonary artery bioprosthetic replacement in ToF	2009
16	MAPCA unifocalization in IV type PA	2009
17	Lymphatic stimulation in severe pulmonary hypertension	2010
18	Anomalous return of VC correction	2011

19	Fontan operation with intraatrial tunneling	2011
20	Fontan operation with extracardiac conduit implantation	2012
21	Double-patch VSD repair in severe pulmonary hypertension	2015
22	Le Compte procedure for truncus arteriosus	2015
23	Ebstein's anomaly radical correction by Carpentier	2015
24	IVS septation in single ventricle	2017
25	Ozaki operation	2018

ALCAPA - anomalous left coronary artery from pulmonary artery, BCPS - bilateral cava-pulmonary shunting, DORV- double-outlet right ventricle, IVS – interventricular septum, MAPCA- major aorto-pulmonary collateral arteries, PA- pulmonary atresia, PS - pulmonary stenosis, RVOT - right ventricular outflow tract, RV-PA-right ventricle to pulmonary artery, TGA - transposition of great arteries, ToF Tetralogy of Fallot, VC- vena cava, VSD - ventricular septal defect