



## SURGICAL EXPERIENCES ACQUIRED BY A CARDIOVASCULAR SURGEON DURING PEDIATRIC CARDIOVASCULAR SURGERY MINOR TRAINING

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### ABSTRACT

**Introduction:** Specialty training for surgical treatment of congenital cardiac diseases which are among the cardiovascular diseases with a wide spectrum is provided as a minor training today. In Turkey, pediatric cardiovascular surgery minor is a two-year training following cardiovascular specialty.

**Material and Method:** Surgeries attended by a cardiovascular surgery specialist during pediatric cardiovascular surgery minor training between 20 March 2015 and 7 July 2017 were examined in detail in our study. Primary surgery and primary assistance numbers in the surgical treatments applied for these patients who were between neonatal period and 48 years of age and had congenital cardiac diseases were retrospectively examined.

**Results:** A total of 405 surgical attendances including 136 primary surgeries and 269 primary assistances were determined in our study. Based on surgeries other than atrial septal defect closures, primary assistance count was 99 and primary assistance count was 241. Early period mortality was detected as 14 (3.45%) in all patients.

**Discussion:** Surgical experiences acquired by a single doctor in a single center during pediatric cardiovascular surgery minor specialty training actively provided in Turkey in 2012 are important for speciality training and standardization. In addition to our study which showed that minor training was successful with low mortality values, more data is required in order to determine the quality of minor training..

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### INTRODUCTION

The surgery done by Ludwig Reh in 1896 to save the life of a patient with cardiac injury by stitching the myocardium is regarded as the starting point of cardiac surgery (Örer and Oto, 1999). Scientific developments in the first half of the twentieth century also contributed to the development of medical branches (Schumacker, 1992). Cardiac surgery has especially become a field where many renovations take place with the use of cardiac lung machine since 1950s (Kıralı et al., 2001). Aydın Aytaç, the Turkish doctor who made the first open heart surgery accompanied by heart lung machine in 1959, had great contribution in the improvement of pediatric cardiac surgery in Turkey (Büyükkateş et al., 2007). More knowledge and experience is needed with the scientific and

technological improvements (Turkish Medical Expertise Committee curriculum creation and standard setting system, 2013). Wide spectrum cardiovascular surgery patients also need special care and treatment experiences. The prevalence of congenital cardiac disease patients among these increases gradually (Hoffman, 2016). The importance of cardiovascular surgery and pediatrics clinics is especially high in the diagnosis, follow-up and treatments of congenital cardiac disease patients. New minor field experts especially in the field of congenital cardiac diseases are raised with the training programs following these majors. Pediatric cardiovascular surgery and pediatric cardiology minor trainings are provided as supplemental training after the major specialty training in the departments they are affiliated to. Minor branches and training durations for cardiovascular surgery and pediatrics departments are shown in Table 1. Pediatric cardiac surgery minor training programs are provided in Canada, United States, Europe and Australia between 6 months and 2 years.

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Since 2012, pediatric cardiac surgery has been provided as a two year training program following cardiovascular surgery training in Turkey under the name of pediatric cardiovascular surgery minor. Two months of pediatric cardiology, a month of neonatology and a month of anesthesia and reanimation rotations are also included in these two years (Turkish Medical Expertise Committee, 2015). The surgical experiences acquired during the minor training by a surgeon taking pediatric cardiovascular surgery minor training after a six-year cardiovascular surgery specialty training are covered in this study.

## MATERIALS AND METHODS

The number of surgeries, primary surgeries and primary assistances attended by a cardiovascular surgery specialist during pediatric cardiovascular surgery minor training between 20 March 2015 and 7 July 2017 were retrospectively examined.

Minor branches affiliated to cardiovascular surgery and pediatrics branches including pediatric cardiovascular surgery branch and their training durations are shown Table 1. Active accompaniment was observed as primary surgeon and primary assistant in the surgeries of a wide spectrum of congenital cardiac disease patients changing between neonatals and 48 year-old adults. The average age of the patients was 7.85 (0-48). Written consent form was taken from all patients before the operation.

## RESULTS

A total of 405 active operation attendances including both primary surgery and primary assistance was determined in our study. This included 136 primary surgeries and 269 primary assistances in total. Based on surgeries other than atrial septal defect closures, primary assistance count was 99 and primary assistance count was 241.

**Table 1. Minor branches affiliated to cardiovascular surgery and pediatrics branches and their training durations**

MINOR BRANCH	DEPARTMENT IT IS AFFILIATED TO	TRAINING DURATION
Pediatric Cardiovascular Surgery	Cardiovascular Surgery	2 years
Pediatric Cardiology	Pediatric Health and Diseases	3 years
Pediatric Emergency	Pediatric Health and Diseases	3 years
Pediatric Endocrinology	Pediatric Health and Diseases	3 years
Pediatric Infection Diseases	Pediatric Health and Diseases	3 years
Pediatric Gastroenterology	Pediatric Health and Diseases	3 years
Pediatric Genetic Diseases	Pediatric Health and Diseases	3 years
Pediatric Pulmonary Diseases	Pediatric Health and Diseases	3 years
Pediatric Hematology and Oncology	Pediatric Health and Diseases	3 years
Pediatric Immunology and Allergy	Pediatric Health and Diseases	3 years
Pediatric Metabolic Diseases	Pediatric Health and Diseases	3 years
Pediatric Nephrology	Pediatric Health and Diseases	3 years
Pediatric Neurology	Pediatric Health and Diseases	3 years
Pediatric Rheumatology	Pediatric Health and Diseases	3 years
Pediatric Intensive Care	Pediatric Health and Diseases	3 years
Developmental Pediatrics	Pediatric Health and Diseases	3 years
Neonatology	Pediatric Health and Diseases	3 years

**Table 2. Operation types, primary surgery and primary assistance numbers participated during minor training (ASD: Atrial septal defect, VSD: Ventricular septal defect, PDA: Patent ductus arteriosus, AVSD: Atrioventricular septal defect, RVOT: Right ventricle outlet tract)**

Operation type	Number of primary surgeries	Number of primary assistances
1- Covering with Isolated ASD Patch	37	28
2- Isolated VSD Primary Covering	1	-
3- Covering with Isolated VSD Patch	14	29
4- Isolated PDA Covering	4	6
5- Pulmonary Banding	7	5
6- Aorta Pulmonary Shunt	5	6
7- Aorta Coarctation Repair	4	9
8- Subaortic Ridge Resection	2	13
9- Interrupted Aortic Arc Repair	-	3
10- Partial AVSD Repair	5	9
11- Intermediate AVSD Repair	2	8
12- Complete AVSD Repair	2	11
13- RVOT Reconstruction with VSD Closure	3	13
14- Unifocalization	-	2
15- Double Outlet Right Ventricle Repair	1	6
16- Fallot Tetralogy Repair	8	23
17- Operated Shunt, Redo Fallot Tetralogy Repair	1	3
18- Partial Pulmonary Venous Return Anomaly Repair	11	12
19- Total Pulmonary Venous Return Anomaly Repair	1	3
20- Bidirectional Glenn Operation	3	11
21- Fontan Operation	1	7
22- Arterial Switch Operation	1	6
23- Truncus Arteriosus Repair	-	3
24- Norwood Stage 1 Operation	-	4
25- ALCAPA Repair	1	1
26- Vascular Ring Repair	1	1
27- Cor triatriatum Repair	1	1
28- Tricuspid Valve Repair During ASD, VSD Closure	9	11
29- Isolated Mitral Valve Repair	2	8
30- Isolated Aortic Valve Repair	1	6
31- Mitral Valve Replacement	2	3
32- Aortic Valve Replacement	2	2
33- Pulmonary Valve Replacement	1	6
34- Ascending Aorta Aneurysm Repair	1	3
35- Isolated Pulmonary Artery Aneurysm Repair	1	4
36- Ebstein Anomaly Repair	1	3

Operation types and numbers of primary surgeries and primary assistances attended during minor training are shown in detail in Table 2. Early mortality was detected in 14 patients (3.45%) and the causes were low cardiac output in six patients and sepsis in eight patients.

## DISCUSSION

1938 was the gateway to congenital cardiac surgery. Robert Gross made the first successful Patent Ductus Arteriosus closure operation (Örer and Oto, 1999). Helen Taussing and Alfred Blalock made the first shunt operation which increased the pulmonary blood flow in a cyanotic patient in 1944 and then John Gibbon made the first successful open cardiac surgery by using heart lung pump in 1953 (Cooley, 1994). He closed the atrial septum defect of his 18 year old patient with extracorporeal circulation technique. Improvements in congenital cardiac surgery gained speed with this. With scientific and technological improvements, experiences and the use of fluid hemodynamics more effectively in clinical terms, it is estimated that mortality and morbidity ratios would decrease gradually in congenital cardiac surgery. We also detected a decrease in mortality ratios in our study. Pediatric cardiovascular surgery minor specialty education has been actively provided in Turkey since 2012. But no scientific articles have yet been published on this difficult surgical training in Turkey. We think that the surgical experiences acquired by a single doctor in a single center are important for minor specialty training and standardization. The application of more than 75 major pediatric cardiac surgeries is recommended for the training program applications in the surgical treatment of congenital cardiac malformations with a wide spectrum (Bove, 2008). In our study, we also observed the active participation of 99 primary surgeons and 241 primary assistants in operations other than atrial septal defect closure. In addition to 405 active operation participations, 2 national congress participations, 4 seminary presentations, 43 scientific meeting participations and 2 scientific publication preparation experiences were detected during the two year minor training.

As a result, we observed that the minor training in our center was completed successfully with low mortality values. But we can assume more data is needed to determine the pediatric cardiovascular surgery minor training quality.

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