Our Experience of Single Stage Repair of Interrupted Aortic Arch and Associated Intracardiac Anomalies

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Introduction:

Interruption of the aortic arch (IAA) is a rare condition, accounting for about 1% of infants with critical congenital heart disease (Collins-Nakai *et al*., 1976). Untreated, the median age at death is 4–10 days, usually following physiological closure of the ductus arteriosus.

Objective:

Interruption of the aortic arch associated with intracardiac malformation remains a surgical challenge. We review our results during 7-years period with a single stage repair of the aortic arch interruption with associated intracardiac malformation.

Methods:

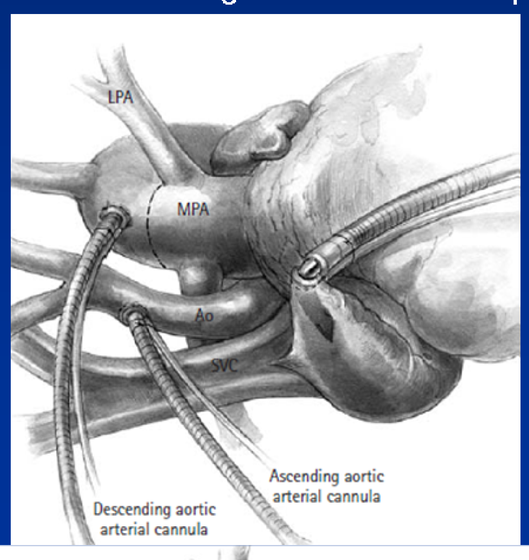
Between 2004 and 2010 in the department of cardiac surgery of Children's hospital №1 14 patients underwent single-stage biventricular repair for aortic arch interruption and associated intracardiac defects. There were 6 boys and 8 girls. Some of the data concerning the preoperative period are presented in Table I.The median age at operation was 13,7 days (from 3 to 39 days) and the mean weight was 3,2±0,4kg. The prostaglandin E (0.01–0.05 mg/kg/min) was used in 10 patients, to maintain ductal patency.

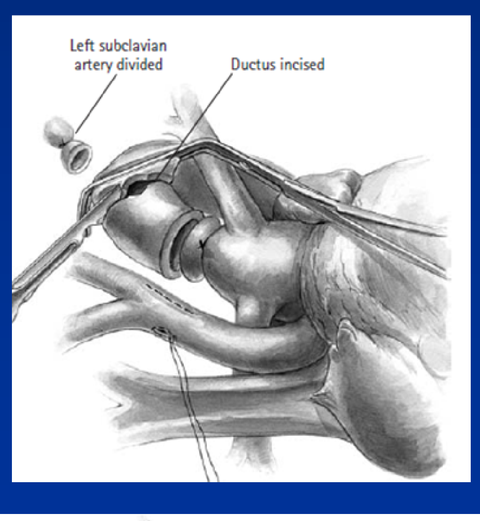
Table I. Preoperative data

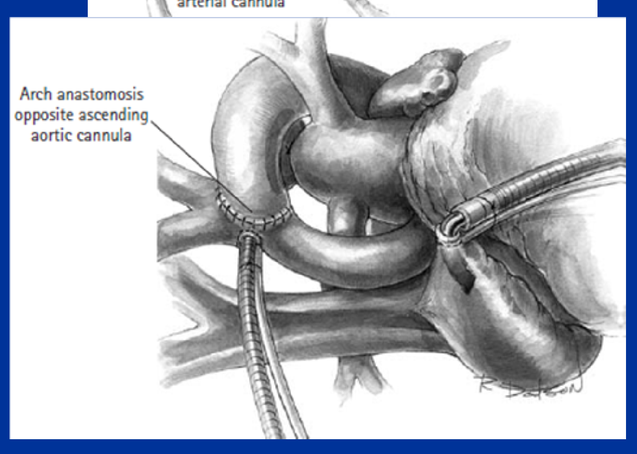
	Range	Mean ± SD
Age (days)	3-39	13,7 ± 11,3
Weight (kg)	2,8-3,5	3,2±0,4
SaO2%	74–93	81±7
PGE max dose (mg/kg/min)	0.01–0.05	0.026 ± 0.016

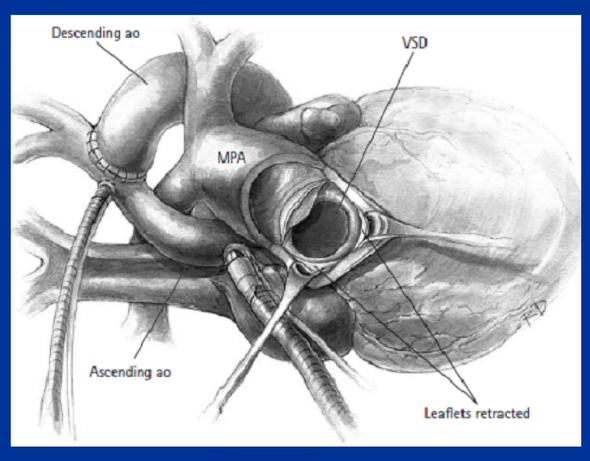
There were eight patients with type B (57,1%), six with type A (42,9%), and none with type C interrupted arch.
Seven patients had only an associated ventricular septal defect. Other seven patients had association of complex malformations (five cases of truncus arteriosus and two cases with aorto-pulmonary window).

All procedures was performed using median sternotomy, hypothermic bypass (18C), and circulatory arrest. The mean cardiopulmonary bypass time was 120,66 ± 37,8 minutes and the mean circulatory arrest time was 43,11 ± 10,21 minutes. Selective cerebral perfusion was not used in this patient group. In all cases the correction consisted of direct end-to-side anastomosis between the descending and the ascending aorta and total repair of associated heart lesions.







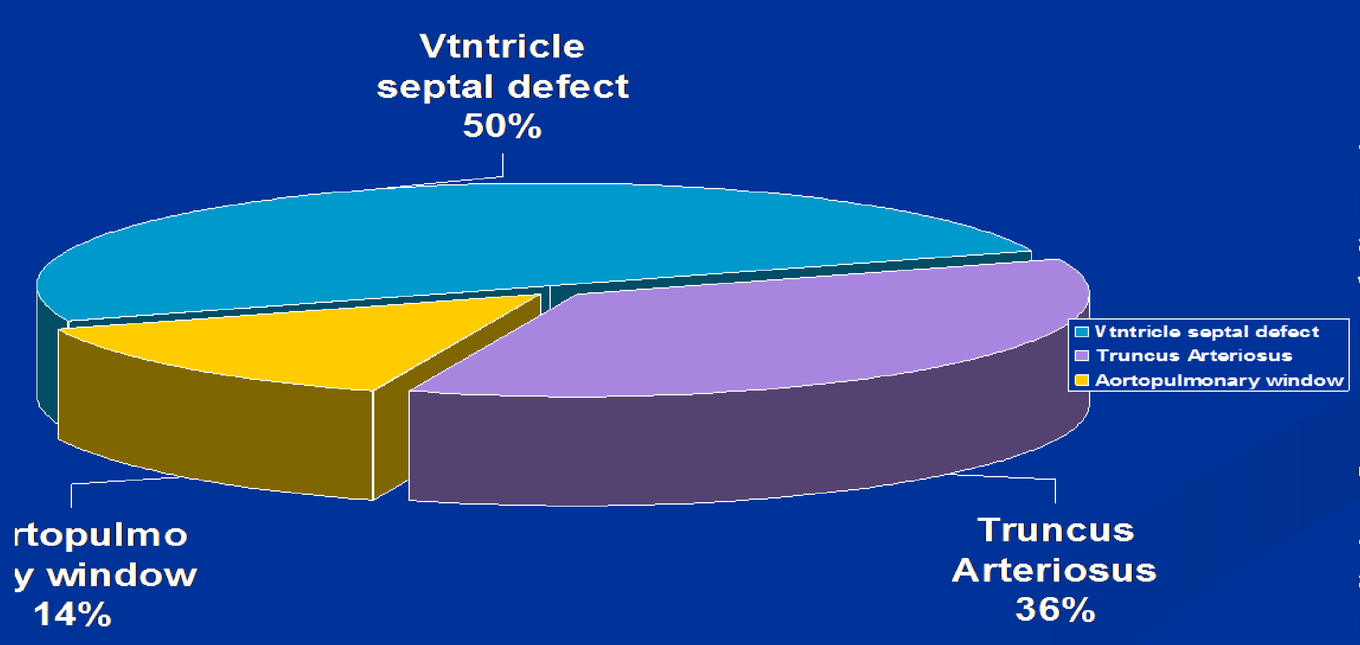


Results:

Some of the data concerning the postoperative period are presented in Table II. The median postoperative ICU stay was 10 days (range 3 to 28 days). Delayed chest closure with a silastic patch was used in six patients.

Table II. Postoperative data

	Range	Mean ± SD
Ventilation time (h)	21-128	67,1 ± 43,4
ICU stay (days)	3-28	10,2 ± 4,3
Inotropic support (h)	23-154	75,4 ± 44,8
Sternal closure (days)	1-3	2 ± 1,4
Hospitalization (days)	22-46	32,5 ± 12,4



There were two early deaths (14,3%). These patients died of postoperative cardiac failure with low cardiac output. The actuarial survival excluding early mortality was 100% at 1 year. There was no incidence of aortic arch reoperation or intervention during 1 year.

Conclusion:

Single stage biventricular repair of aortic arch interruption and associated intracardiac defects can achieve good early and midterm results and low mortality rate. The optimal method of repair of IAA appears to be with direct anastomosis which allows to rely on the absence or minimal need for arch reintervention.