

MID- TO LONG-TERM OUTCOMES OF AORTIC ARCH REPAIR IN NEONATES AND CHILDREN WITH AORTIC COARCTATION: A SINGLE CENTER EXPERIENCE



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BACKGROUND

Aortic coarctation is a congenital narrowing of the aorta usually distal to the origin of the left subclavian artery. Repair of aortic coarctation in neonates and infants is mostly performed surgically and it is associated with a low mortality rate. However, a recurrence of the stenosis (recoarctation) occurs in 10 – 30% of cases.

AIM OF THE STUDY

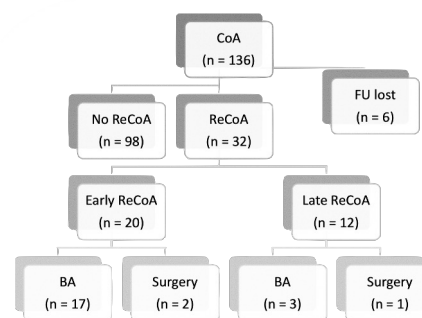
Evaluate the mid- to long-term follow-up after aortic coarctation surgical repair focusing on morbidity in terms of recoarctation rate, particularly in relation to different types of surgical approaches and age at time of intervention, among other variables reported in *Table 1*.

METHODS

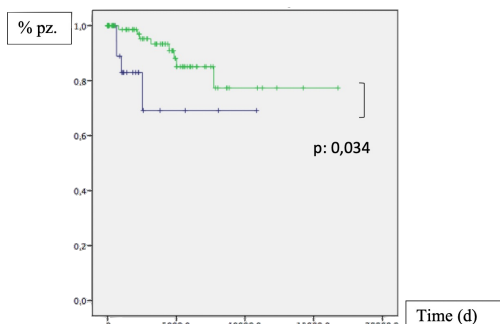
We performed a retrospective review of our institute's clinical, echocardiographic and surgical data regarding patients that underwent surgical correction of native aortic coarctation between 1971 and 2018. Patients with left heart syndrome and those with a borderline left ventricle requiring Norwood procedure were excluded. Recoarctation was defined as a peak systolic gradient of ≥ 35 mmHg at doppler echocardiography study in addition with the persistency of a diastolic run off. We considered one year after the first surgical intervention as a cut off for an early recoarctation.

RESULTS

136 patients were included. The median age at the intervention was 39 days (IQR, 13 – 309), 59 patients (43,4%) underwent surgery under the age of one month. 107 patients (78,7%) were treated by extended end-to-end anastomosis (EEEE), 17 (12,5%) by end-to-side anastomosis (ESA), 5 patients (3,7%) with prosthetic (Vaskutek[®]) patch aortoplasty, and 1 (0,7%) underwent subclavian flap aortoplasty. The median follow-up was 8,7 years (IQR, 1,8 – 14,9 years). There were two early deaths (1,5%) and no late deaths. Six patients were lost at follow-up. 32 (23,5%) had a recoarctation, of which 20 early one (62,5%), and 12 late one (37,5%). 23 patients (16,9%) underwent a reintervention for the treatment of recurrent coarctation. 20 underwent a balloon angioplasty and 3 a surgical repair. Extended end-to-end anastomosis resulted to be a protective factor for the late recoarctation ($p = 0,034$). Age at surgery ≤ 30 days was independently associated with a higher rate of early recoarctation ($p = 0,003$).



Overview of the study population.



Kaplan Meier showing freedom from late recoarctation. There is a significant difference between EEEE (green) and other interventions (blue)

Univariate Analysis

Multivariate Analysis

	All	Early	Late	All	Early	Late
Age at surgery	p = 0,003	p < 0,001	p = 0,535	p < 0,001	p = 0,003	-
Sex	p = 0,101	p = 0,016	p = 0,438	-	p = 0,014	-
Ass. cardiac anomalies	p = 0,04	p = 0,007	0,551	p = 0,465	p = 0,100	-
Bicuspid aortic valve	p = 0,487	p = 0,150	p = 0,219	-	-	-
Genetic syndromes	p = 0,497	p = 0,606	p = 0,590	-	-	-

Table 1. Univariate and multivariate analysis for variables whose relation with recoarctation was studied

CONCLUSIONS

The results of our study confirm, in agreement with literature, that extended end-to-end anastomosis is an effective approach for aortic coarctation repair and that, compared with other surgical techniques, represents a protective factor for recoarctation in the mid- to long-term follow-up. Patients who are subjected to surgery under one month of age have a higher risk of recoarctation in the first postoperative year.