



SURGICAL CORRECTION OF AORTIC COARCTATION IN DIFFERENT AGE GROUPS

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Introduction: Coarctation of the aorta (CoA) is a congenital heart defect that occurs when a section of the aorta, the main artery that carries blood from the heart to the rest of the body, becomes narrow. CoA requires prompt correction to prevent significant morbidity and mortality. While surgical intervention is the standard treatment for this condition, the optimal timing for intervention, particularly regarding age, remains controversial.

Aim: This abstract aims to explore the surgical correction of CoA in different age groups, analyzing the outcomes, complications, and long-term prognosis of CoA repair in neonates, infants, children, and adults.

Materials and methods: A retrospective cohort study was performed. Medical records and CT scans were analyzed retrospectively and all relevant information and CT scan measurements about 120 patients, who underwent four different types of surgical repair of coarctation of aorta between 2012-2022 was acquired to perform statistical analysis. All statistical analysis was performed using SPSS and Jamovi applications.

Results: 120 patients (85 males, 70.8%), with median age of 39 months (IQR=133, range from 12 days to 48 years), who diagnosed with isolated CoA. Patients were divided in to 4 groups according their age during the operation: group 1 – infants until 1 year of age (46 patients, 38.3%), group 2 – from 1 to 3 years of age (15 patients, 12.5%), group 3 – from 3 to 10 years of age (25 patients, 20.8%), group 4 – patients who were over 10 years of age (34 patients, 28.3%). They underwent 4 different types of surgical repair through left thoracotomy: resection with end-to-end anastomosis (EEA, in 27 patients, 22.5%), aortoplasty using ‘Goretex’ patch (AP, in 52 patients, 43.3%), resection with extended end-to-end anastomosis (EEEEA, in 35 patients, 29.2%) and Prosthetic Interposition Graft (PIG, in 6 patients, 5%). Intraoperative mortality was 0.8% (1 patient).

ANOVA test showed that, operation time and aortic cross clamp time were significantly more in group 4 ($p=.008$ and $.004$, respectively) and post-operative mean pressure gradient on the coarctation site were significantly higher in group 3 (23.06 mmHg) and group 4 (17.05 mmHg) than group 1 (12.92 mmHg) and group 2 (12.95 mmHg), $p=0.008$. post-operative ICU and hospital stay did not show any significant difference between age groups.



Chi-square test showed, LV hypokinesis occurred more in group 1 (9 patients), while other groups had 3 patients each ($p=0.05$). Operative techniques used differently according to age groups:

Contingency Tables

Age groups	Operation type groups				Total	χ^2 Tests		
	EEA	AP	EEEA	PIG				
1	12	5	29	0	46	χ^2	71.6	9
2	5	4	6	0	15			
3	7	16	0	2	25			
4	3	27	0	4	34			
Total	27	52	35	6	120			
						N	120	
						p		
						<.001		

Table 1. Comparison (Chi-squared) test between age and operation type groups

Table above (table 1) showed that, EEEA is used in group 1 more than other groups, while this method was not used in group 3 and 4. It can be explained that, it is technically difficult to move the aorta in older patients, therefore AP was used more in this patients. PIG is used in older patients, it is axiomatic that, prosthetic graft size does not change by time, and small patients who had underwent PIG would require another operation, graft exchange after some time, because of small size.

Conclusion: the present study showed that, patients who underwent surgery in younger ages showed better results with lower post-operative pressure gradient on the coarctation site. Besides that, operation time and aortic cross clamp time were significantly longer in older patients. LV dysfunction tends to develop in infancy. Therefore, it is suggested that, surgical repair of CoA should be performed as soon as possible during infancy. Choosing of surgical method highly depends on patients age.