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The Effect of Upper Body Central Venous Catheter Insertion on Superior Vena Cava Anatomy and Systemic Venous Return in Infants with Single Ventricle

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Introduction: The upper-body central venous (UBCV) catheter insertion is a widespread technique during pediatric cardiac surgery but might result in obstruction. This complication may especially have serious results in patients with cavopulmonary shunt (CPS). In this study our aim is to evaluate the effect of UBCVC insertion at first operation on superior vena cava (SVC) anatomy and systemic venous return during inter stage period.

Methods: The data of 73 children, who underwent palliation for single-ventricle (Norwood operation=6, stage 1 hybrid palliation=3, systemic to pulmonary artery shunt =24, PA banding=22, PDA stenting=15) and consequently pre-CPS cardiac catheterization between 2010- 2015 were gathered retrospectively. Patients were grouped as the ones who had UBCV catheter (group 1) and ones who did not have (group 2). The SVC size evaluated with SVC index and SVC/Nakata index ratio .

Results: UBCV obstruction occurred in 4 of 26 (15.3%) patients in group 1, and in 1 of 47 (2.1%) patients in group 2 (p= .004). The mean duration of catheterization was 8.9 days for group 1 and this was longer in patients who had UBCV obstruction (12.5 days). The demographic data of the patients were demonstrated at Table 1.

Conclusion: This study showed with significantly higher prevalences of obstruction in group 1. Although statistically not significant, SVC indexes of group 1 patients were lower. UBCV catheter insertion in patients with univentricular cardiac anatomy might not be proper. Future studies with larger sample size will help to clarify this problem.

Table 1. Patient Demographics			
	Group 1 (n=26)	Group 2 (n=47)	p value*
Age, months	11.5±7.4	10.2±7.8	0.13
Bilateral SVCs	6 (23.1%)	9 (19.1%)	0.76
Venous obstruction Right internal jugular Right SVC Left SVC Left innominate	4(15.3%) 1 1 1 1	1 (2.1%) 1 	**0,04**
SVC diameter (mm)	8.9±1.6	8.7±2.2	0.19
Indexed SVC[1]	22.4±4.3	23.8±6.04	0.62
Nakata index(mm/m2)	243.8±124.5	212.6±101.6	0.38
SVC/Nakata index ratio	0.11±0.09	0.14±0.05	0.30
* *p* value of <0.05 was considered statistically significant [1] SVC size mm/BSA mm²			