Aerodigestive Disorders in Patients with Congenital Heart Disease: Prevalence and Outcomes

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INTRODUCTION

- Infants with congenital heart disease are at high risk for congenital and/or acquired aerodigestive disorders
- Aerodigestive disorders include conditions that impair coordination of breathing, swallowing, and digestion
- There is limited data surrounding aerodigestive disorders in this population and therefore limited guidance on how to approach these patients

Study aims:

- Characterize the prevalence and types of aerodigestive disorders present in children with congenital heart disease
- Evaluate the impact of aerodigestive conditions on ICU and surgical outcomes

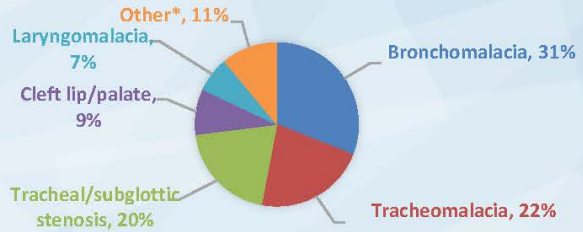
METHODS

- Single center retrospective study of all patients admitted to the CTICU between 2017-2024
- Data extracted from PC4 and STS databases
- A total of 2038 encounters for 1177 patients were reviewed and further stratified based off identified aerodigestive disorders
- ICU and surgical outcomes compared between Aerodigestive and Non-Aerodigestive groups
- Calculations included summary statistics (median [IQR], n (%))[1], Wilcoxon rank sum test[2], Pearson's Chi-squared test[2], Fisher's exact test[2], and Benjamini & Hochberg correction for multiple testing[3]

RESULTS

% AERODIGESTIVE DISORDER

TYPES OF AERODIGESTIVE DISORDERS



*Micrognathia, TEF, CDH, malrotation, duodenal atresia, laryngeal cleft, choanal atresia, omphalocele, esophageal stenosis

Table 1. ICU outcomes stratified by group

Characteristics	Aerodigestive[1], N= 555	Non-Aerodigestive[1] N= 1482	p-value[2]	q-value[3]
Age (days)	200 (64, 546)	133 (4, 413)	<0.001	<0.001
Age group:			<0.001	<0.001
Neonate	105 (18.9%)	462 (31.2%)		
Infant	249 (44.9%)	333 (42.4%)		
Child	201 (36.2%)	220 (26.5%)		
Length of stay (days)	3.69 (1.1, 12.8)	2.85 (1.5, 8.2)	0.019	0.025
Bronchoscopy	252 (45.4%)	89 (6.0%)	<0.001	<0.001
Tracheostomy	33 (15.8%)[4]	3 (0.31%)[4]	<0.001	<0.001
Tube feeds at discharge	357 (64.3%)	468 (31.6%)	<0.001	<0.001
Intubation during admission	376 (67.8%)	930 (62.8%)	0.036	0.041
Multiple intubations (>1) in single admission	85 (15.3%)	153 (10.3%)	0.002	0.003
Cardiac arrest	107 (51.2%)	252 (26.0%)	<0.001	<0.001
ECMO	102 (48.8%)	228 (23.6%)	0.059	0.059
Mortality	28 (13.4%)[4]	41 (4.24%)[4]	<0.001	<0.001

Table 2. Surgical outcomes stratified by group

Characteristics	Aerodigestive[1], N= 203	Non-Aerodigestive[1], N= 869	p-value[2]	q-value[3]
Age at operation (days)	144 (29, 333)	140 (19, 401)	0.360	0.396
STAT category				
1	61 (30.5%)	394 (45.5%)		
2	56 (28.0%)	214 (24.7%)		
3	34 (17.0%)	124 (14.3%)		
4	37 (18.5%)	97 (11.2%)		
5	12 (6.0%)	37 (4.3%)		
N/A	3	3		
Cardiopulmonary bypass time (mins)	124 (73.5, 200)	94 (53, 151)	<0.001	<0.001
Cross-clamp time (mins)	64 (24.5, 99.5)	51 (17.0, 82.0)	0.004	0.006
Circulatory arrest time (mins)	0 (0.0, 0.0)	0 (0.0, 0.0)	0.128	0.157
LOS (days)	8.6 (2.7, 29.5)	3.74 (1.8, 10.8)	<0.001	<0.001
Time to extubation (days)	0.77 (0.2, 3.5)	0.47 (0.18, 1.7)	0.002	0.003
Unknown	1	172		
Diaphragm dysfunction	8 (3.9%)	26 (3.0%)	0.487	0.487
Vocal cord dysfunction	10 (4.9%)	16 (1.8%)	0.019	0.026
Cardiac arrest	23 (11.3%)	26 (3.0%)	<0.001	<0.001
ECMO	23 (11.3%)	41 (4.7%)	<0.001	<0.001
Mortality (surgical)	11 (6.4%)[4]	14 (1.8%)[4]	0.002	0.002

CONCLUSIONS

- Of the 1177 patients, 209 patients had an identified aerodigestive disorder (17.7%)
- Patients with congenital heart disease and a concomitant aerodigestive disorder are at increased risk of longer length of stay, tube feeds at discharge, cardiac arrest, post-op ECMO requirement, and/or mortality
- Early detection of aerodigestive comorbidities in patients with congenital heart disease allows for a more tailored approach to peri-op and post-op care