

Operative Complications Following Gastrostomy Tube Placement After Cardiac Surgery During Infancy

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BACKGROUND

- Infants with congenital heart disease (CHD) often develop aspiration or inadequate PO intake after initial cardiac repair
- Gastrostomy tubes (GT) are often placed in these patients
- It is unknown how long these patients require GT
- We aimed to quantify rate of operative GT related complications and predictors of short-term use in infants with CHD in order to inform parental counseling discussions regarding the true risks and benefits of GT placement.

PURPOSE

- To quantify rate of operative GT related complications and predictors of short-term use in infants with CHD in order to inform parental counseling discussions regarding the true risks and benefits of GT placement.

METHODS

- We reviewed infants aged <1 y with congenital heart disease who underwent GT placement after cardiac surgery between 2018 and 2021.
- Rate of postoperative GT complications were collected. These were categorized as infectious, granulation tissue within two weeks of surgery requiring intervention, tube dislodgement, leakage, unplanned ED visit, or unplanned readmission.
- Comparisons were made between infants who required GT for more than 1 y and those who used it for less than 1 y to identify preoperative factors which could identify infants who only require enteral feed for a short time period.

- Continuous variables were analyzed with a Mann-Whitney U test, and categorical variables were analyzed with a Chi-square test or Fisher's exact test. A P value of <0.05 was considered statistically significant. All statistical analyses were performed with PRISM version 9.4.1 (1994-2022 GraphPad Software, LLC).

RESULTS

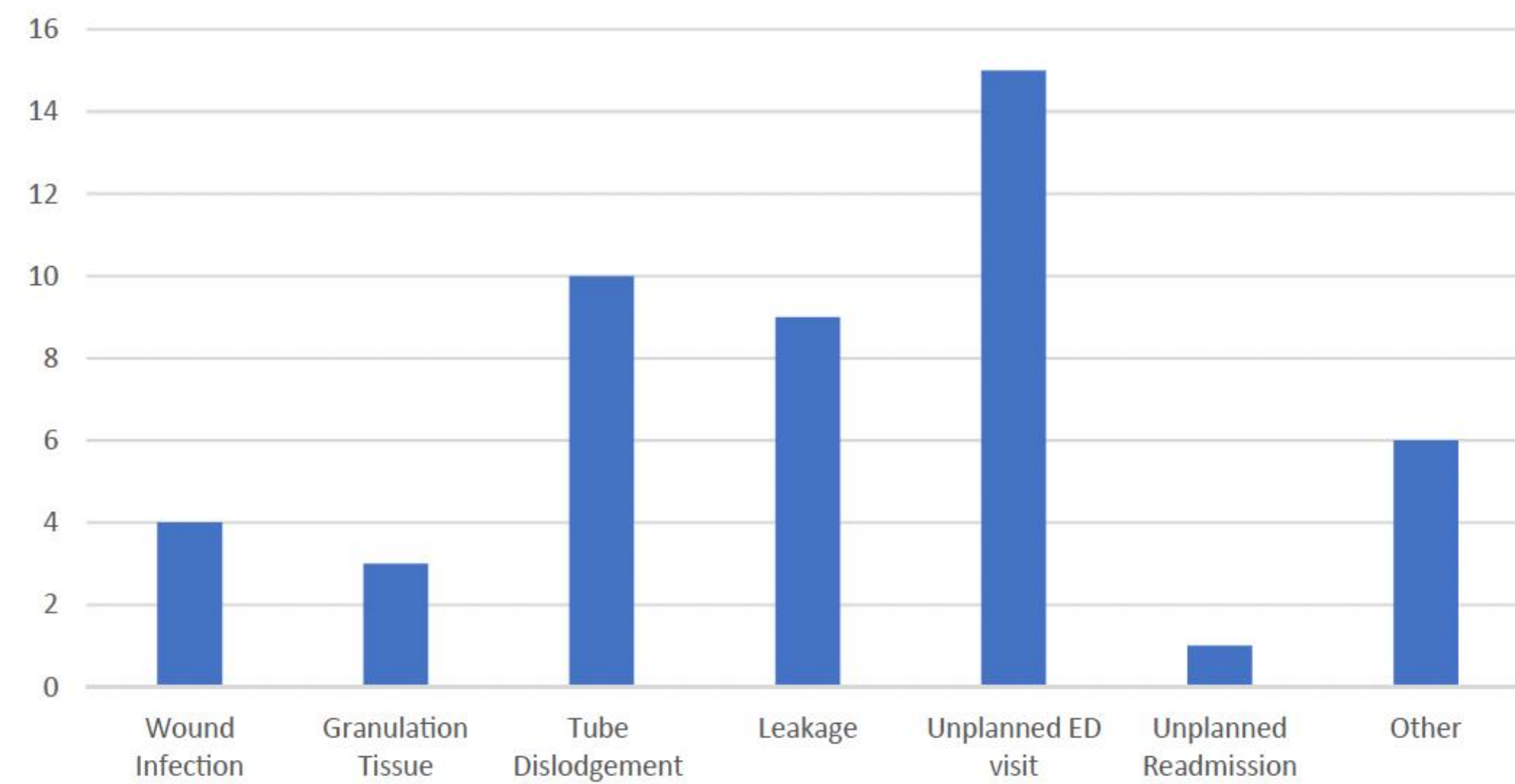


Fig. 1 – Gastrostomy tube complication occurrences and type among infants with CHD following cardiac surgery.

Table 1 – Characteristics of infants who required gastrostomy for more or less than 1 y following an initial cardiac operation.			
Variable	<1 y (n = 34)	>1 y (n = 99)	P value
Male sex, N (%)	22 (65%)	56 (56%)	0.43
Race, N (%)			0.74
White	24 (71%)	69 (69%)	
Black or African American	2 (6%)	5 (5%)	
Asian	0 (0%)	4 (4%)	
American Indian or Native Alaskan	2 (6%)	3 (3%)	
Unknown	6 (18%)	18 (18%)	
Ethnicity, N (%)			0.53
Hispanic or Latino	13 (38%)	33 (33%)	
Not Hispanic or Latino	17 (50%)	59 (59%)	
Unknown	4 (12%)	7 (7%)	
Gestational age at birth (wk), median (IQR)	39 (3.78, 39)	38 (36, 39)	0.003
Live in rural location, N (%)	7 (21%)	18 (18%)	0.8
Miles from hospital of home address, median (IQR)	43.5 (12, 294.8)	62 (18, 136)	0.33
Staged cardiac operation, N (%)	15 (44%)	48 (48%)	0.69
Complication from cardiac operation, N (%)	17 (50%)	46 (46%)	0.84
Days from cardiac operation to GT, median (IQR)	24.5 (18.8, 37)	33 (20.8, 57.3)	0.06
Day of life at GT, median (IQR)	31 (26.5, 48.25)	61 (37, 102)	<0.0001
Weight at GT (kg), median (IQR)	3.5 (3.2, 4.2)	3.85 (3.3, 4.7)	0.042
GT = gastrostomy tube; IQR = interquartile range.			

Table 2 – Comorbidities of infants who required gastrostomy for more or less than 1 y following an initial cardiac operation.			
Comorbidity	<1 y (n = 34)	>1 y (n = 99)	P value
Medical comorbidities, any, N (%)	13 (38%)	23 (23%)	0.12
IVH/stroke/seizures, N (%)	1 (3%)	7 (7%)	0.68
Oxygen requirement at GT surgery, N (%)	13 (38%)	49 (49%)	0.32
Oxygen requirement at discharge, N (%)	10 (29%)	35 (35%)	0.68
AKI or renal failure, N (%)	0 (0%)	11 (11%)	0.07
Liver disease, N (%)	2 (6%)	3 (3%)	0.6
Genetic syndrome, N (%)	5 (15%)	27 (27%)	0.17
Prior episode of pneumatosis intestinalis, N (%)	5 (15%)	10 (10%)	0.53
Prior abdominal operation, N (%)	0 (0%)	2 (2%)	1
Prior ECMO run, N (%)	6 (18%)	17 (17%)	1
Length of ECMO (d), median (IQR)	4.5 (2, 9.5)	5.5 (3.3, 21.5)	0.39
Aspiration prior to GT, N (%)	19 (56%)	38 (38%)	0.11
Percentage of oral intake at time of GT, median (IQR)	7.5 (0, 25)	0 (0, 16.3)	0.18
Percentage of oral intake at discharge, median (IQR)	12 (0, 25)	0 (0, 20)	0.23
IVH = intraventricular hemorrhage; GT = gastrostomy tube; AKI = acute kidney injury; ECMO = extracorporeal membrane oxygenation; IQR = interquartile range.			

CONCLUSIONS

- Complications occurred in 35 infants (26%)
- An important takeaway from our series is the high rate of GC fistula closure in this population which is similar to other published data reporting about one-third of children requiring GC fistula closure after GT removal
- Day of life at the time of GT placement was lower in the group who used the tube for less than 1 y than those who used it for more than 1 y (median 31 d versus 61 d; P < 0.0001)

IMPLICATIONS

- While GT placement may be considered a more stable form of enteral supplementation, it may be beneficial to consider NG tube feeds for infants with proper family support and care.
- Pediatric surgeons should consider the risks and benefits of GT placement as well as alternative means of supplemental feeding, including NG feeding, when counseling families and making treatment recommendations.

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DISCLOSURES

- No conflicts to disclose