



# A cross-sectional evaluation of outcomes of pediatric branchial cleft cyst excision

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## OBJECTIVE

To examine complications following pediatric branchial cleft cyst excision by surgical specialty, demographics, and comorbid conditions.

## METHODS

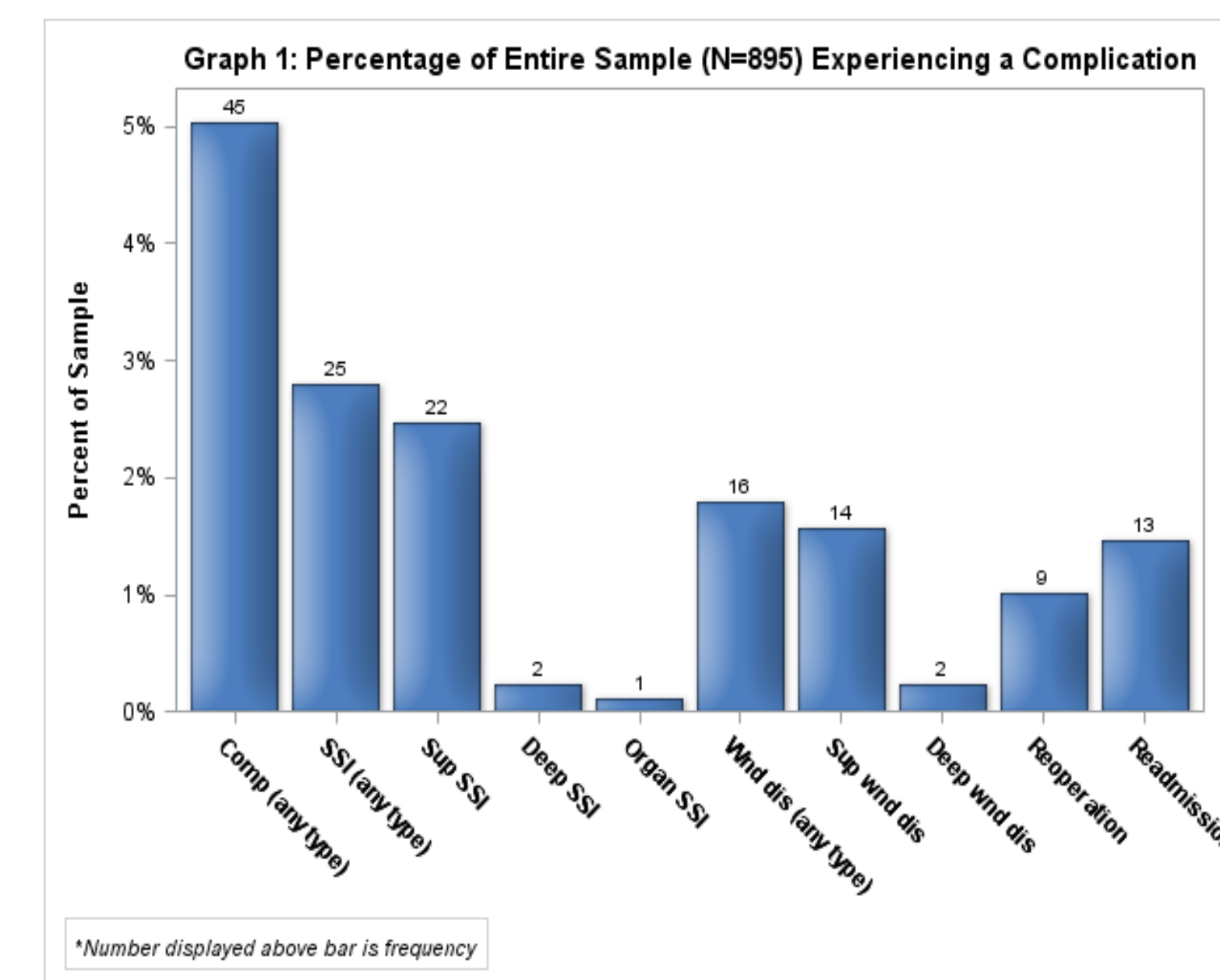
Approval was obtained from the Institutional Review Board of the Lehigh Valley Health Network. This data was acquired through a Pediatrics Participant User File available for NSQIP participating hospitals. The Lehigh Valley Health Children's Hospital is a NSQIP participating site. A retrospective review of the National Surgical Quality Improvement Program database was performed. Pediatric cases from January 1, 2015 through May 1, 2017 with a current procedural terminology code of 42810 (excision branchial cleft cyst or vestige, confined to skin and subcutaneous tissues) or 42815 (excision branchial cleft cyst, vestige, or fistula, extending beneath subcutaneous tissues and/or into the pharynx) were included. Statistical analysis was performed to assess associations between complications and surgical specialty, demographics, and comorbidities.

Table 1 Complications by Specialty	Pediatric Otolaryngology (N=500)	Pediatric Plastics (N=90)	Plastics (N=35)	Pediatric Surgery (N=197)	Otolaryngology (N=68)	General Surgery (N=5)	P-value
Any Complication	30 (6)	1 (1.1)	1 (2.9)	9 (4.6)	4 (5.9)	-	0.45
Overall SSI	17 (3.4)	-	-	5 (2.5)	3 (4.4)	-	0.39
Superficial	15 (3)	-	-	4 (2.0)	3 (4.4)	-	0.39
Deep	1 (0.2)	-	-	1 (0.5)	-	-	0.69
Organ/Space	1 (0.2)	-	-	-	-	-	1.00
Overall Wound Disruption	8 (1.6)	1 (1.1)	-	6 (3.1)	1 (1.5)	-	0.72
Superficial	7 (1.4)	1 (1.1)	-	5 (2.5)	1 (1.5)	-	0.85
Deep	1 (0.2)	-	-	1 (0.5)	-	-	0.69
Transfusion	-	-	-	-	-	-	-
Reoperation	9 (1.8)	-	-	-	-	-	0.28
Readmission	11 (2.2)	-	1 (2.9)	-	1 (1.5)	-	0.13
Death	-	-	-	-	-	-	-

## RESULTS

Of the 895 cases that met inclusion criteria, the median age was two years and there was an approximately equal number of males (46.8%) and females (53.2%). Forty-five patients (5.0%) experienced at least one 30-day complication, the most predominant of which was superficial surgical site infection. There was no statistically significant difference between complications and surgical specialty, complications and patient demographics, or complications and depth of excision. There was a statistically significant difference (p=0.05) in the percentage of patients with a past medical history of developmental delay between those with at least one complication (11.1%) compared to those without any complications (4.2%).

Table 2: Past Medical History by Complication	Entire Sample (N=895)	At Least One Complication (N=45)	No Complications (N=850)	P- value
At least one comorbidity*	209 (26.0)	13 (32.5)	196 (25.6)	0.33†
Premature Birth (< 37 weeks)‡	67 (8.5)	4 (10.3)	63 (8.5)	0.57
Asthma	45 (5.0)	2 (4.4)	43 (5.1)	1.00
Chronic Lung Disease	9 (1.0)	2 (4.4)	7 (0.8)	0.07
Oxygen Support	1 (0.1)	-	1 (0.1)	1.00
Structural Pulmonary Abnormality	17 (1.9)	1 (2.2)	16 (1.9)	0.59
Esophageal/Gastric/Intestinal Disease	27 (3.0)	3 (6.7)	24 (2.8)	0.15
Cardiac Surgery	9 (1.0)	1 (2.2)	8 (0.9)	0.37
Developmental Delay	41 (4.6)	5 (11.1)	36 (4.2)	<b>0.05</b>
Seizure Disorder	4 (0.5)	-	4 (0.5)	1.00
Cerebral Palsy	-	-	-	-
Neuromuscular Disorder	4 (0.5)	-	4 (0.5)	1.00
Steroid 30 days	4 (0.5)	-	4 (0.5)	1.00
Open Wound	44 (4.9)	4 (8.9)	40 (4.7)	0.27
Malignancy	2 (0.2)	-	2 (0.2)	1.00



Graph 1: Complication Rate. The following shows the percent of entire sample experiencing a complication. Abbreviations: Comp = Complications, SSI = Surgical Site Infection, Sup = Superficial, WND = Wound, and Dis = Disruption

## DISCUSSION

This analysis of branchial cleft anomalies using the NSQIP database found the total complication rate to be 5%, and children with developmental delays were more likely to have a complication. We did not find a difference in complication rates for age, sex, race, or surgical specialty. Previous studies assessing overall complication rate for branchial cleft cyst excision quote a 5-6% complication rate which is consistent with the NSQIP data analysis.<sup>1,2</sup>

## DISCUSSION (cont)

It is reassuring to note that complication rates for branchial cleft cyst excision appear to be low across all surgical specialties. This is important to consider in regards to patient access to subspecialists. Per the AAMC, in 2014 there were 266 pediatric otolaryngologists nationwide, which is 0.08 per 100,000 people in the general population.<sup>3</sup> Given this, it is reasonable to assume that there are geographic areas where access to a pediatric otolaryngologist may be difficult. This study confirms that patients will have a low 30-day morbidity rate, regardless of which surgical specialty is accessible to them.

There was a statistically significant higher percentage of patients with developmental delay in the group experiencing at least one complication. Among those with developmental delay, surgical site infection was again the most common complication. Of interest, all other patient comorbidities were not associated with a change in complication rate. This is important to note for operative planning in this population. A potential tool to reduce the risk of infection in this population is perioperative antibiotic prophylaxis. In a recent comprehensive review, compliance with antibiotic prophylaxis was shown to have the potential to reduce surgical site infections by up to 30% in pediatric patients.<sup>4</sup> The results of this study warrant further research into perioperative antibiotic prophylaxis specifically in the pediatric population with developmental delay.

## CONCLUSIONS

Branchial cleft excision is a generally safe procedure across surgical specialties and patient demographics. There is an association between a history of developmental delay and 30-day postoperative complications.

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