

## Abstract

**Objective:** To identify risk factors and perioperative morbidity for pediatric patients undergoing septoplasty.

**Methods:** Retrospective cross-sectional analysis of the American College of Surgeons National Surgical Quality Improvement Program pediatric database was conducted to identify cases of septoplasty (CPT 30520) performed for deviated nasal septum (ICD J34.2) between 2018 and 2019. Patient demographics, preoperative comorbidities, operative data, and postoperative outcomes were assessed.

**Results:** A total of 729 patients were identified. Most patients were older than 15 years (63.9%). Overall, complication rates were low (0.6%), with asthma being the only significant risk factor related to complication rate ( $p=0.035$ ). No significant role for age was identified.

**Conclusion:** Pediatric patients can safely undergo septoplasty with complication rates <1%. Furthermore, the procedure can safely be performed on children of any age.

## Introduction

Deviated nasal septum is a common cause for impaired breathing in children, and the timing of surgical intervention in these patients has been widely debated, citing the role of septal cartilage on midface development. Studies have demonstrated improvement in quality of life for children undergoing septoplasty. It has been suggested that children as young as 6 years can safely undergo this procedure, with improved facial growth, rather than stunted. We sought to assess 30-day postoperative outcomes in children undergoing septoplasty.

## Methods and Materials

A retrospective review was conducted using the American College of Surgeons National Surgical Quality Improvement Program Pediatric (NSQIP-P) database from 2018-2019. A total of 1461 pediatric cases of septoplasty were identified using Current Procedural Terminology (CPT) code 30520. Patients with diagnosis of deviated nasal septum were included, while those with irrelevant diagnoses or undergoing concurrent procedures were excluded, leaving a total of 729 patients for analysis. Age was categorized into three groupings (<6, 6 to 15, and >15 years).

## Results

A total of 1461 pediatric cases of septoplasty were identified. After reviewing exclusion criteria, a total of 729 children were found to have undergone septoplasty for deviated nasal septum.

**Table 1. Population Demographics and Postoperative Outcomes**

Variable	Patient (N=729)
<b>Age</b> (median Q1-Q3, years)	15.8 (13.9-17.0)
<6 years	1.2% (9)
6 to 15 years	34.8% (254)
>15 years	63.9% (466)
<b>Race</b>	
African American	4.0% (29)
Caucasian	71.3% (520)
Other	3.0% (22)
Unknown/Not Reported	21.7% (158)
<b>Gender</b>	
Female	31.0% (226)
Male	69.0% (503)
<b>BMI</b> (median Q1-Q3)	22.2 (19.1-26.0)
<b>Surgery Location</b>	
Inpatient	5.6% (41)
Outpatient	94.4% (688)
<b>Selected Medical Comorbidities</b>	
Asthma	8.1% (59)
Cardiac Risk Factors	
Major	1.4% (10)
Minor	1.2% (9)
Developmental Delay	4.0% (29)
Hematologic Disorder	1.4% (10)
Seizure Disorder	2.2% (16)
Structural Pulmonary Abnormality	5.2% (38)
<b>Surgeon Specialty</b>	
Otolaryngology	21.8% (159)
Pediatric Otolaryngology	71.6% (522)
Pediatric Plastic Surgery	4.0% (29)
Pediatric Surgery	0.1% (1)
Plastic Surgery	2.5% (18)
<b>Postoperative Complications</b>	0.6% (4)
Surgical Site Infection	0.1% (1)
Septic Shock	0.1% (1)
Readmission	0.4% (3)
<b>Reintubation</b>	0.1% (1)
<b>Reoperation</b>	0.4% (3)
<b>Operative Time</b> (median Q1-Q3, minutes)	64.0 (45.0-91.0)
<b>Total Length of Stay (LOS)</b>	
0 days	93.3% (680)
1 day	6.6% (48)
>1 day	0.1% (1)

**Table 1.** Demographics of included population with postoperative outcomes. Note, postoperative outcome rates are not exclusive.

**Table 2. Relationship to Comorbid Conditions**

Medical Comorbidity	LOS ≥1	P value	Complication Rate	P value
Asthma	13.6%	0.050	3.4%	0.035
Cardiac Risk Factors	11.1%	0.544	0	-
Developmental Delay	20.7%	0.010	0	-
Hematologic Disorder	50.0%	<0.001	0	-
Seizure Disorder	18.8%	0.086	0	-
Structural Pulmonary	21.1%	0.002	2.6%	0.193

**Table 2.** Relationship of comorbid medical conditions with increased length of stay (LOS) and complication rate.

**Table 3. Multivariate Model for LOS**

Variable	Odds Ratio (95% CI)
BMI	1.84 (1.24, 2.75)
Structural Pulmonary Abnormality	3.23 (1.35, 7.75)
Developmental Delay	4.35 (1.61, 11.76)

**Table 3.** Multivariate logistic regression model including significant predictors (defined as  $p < 0.05$ )

## Discussion and Conclusions

While many pediatric patients undergoing septoplasty were older than age 15, we demonstrate no significant difference in 30-day outcomes for patients of any age. The operation is performed most frequently by pediatric otolaryngologists, although no significant difference was identified in postoperative outcomes by surgeon specialty. The only significant predictor for complication rate was history of asthma. For most patients, this was performed as an outpatient procedure with a LOS <24 hours. However increased LOS was significantly related to comorbid conditions, including asthma, structural pulmonary abnormalities, developmental delay, and hematologic conditions. Further multivariate modelling suggests that when accounting for other factors, BMI, structural pulmonary abnormalities, and developmental delay predict increased LOS following pediatric septoplasty. Due to limitations inherent to the database, we were unable to comment on the long-term outcomes following this procedure, including alterations in midface development.

In conclusion, pediatric patients can safely undergo septoplasty with complication rates <1%. Children with history of asthma are at increased risk for development of complications and increased length of stay.

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