



Introduction

- Functional endoscopic sinus surgery (FESS) treats refractory chronic rhinosinusitis that has failed medical therapy.
- In prior studies, FESS in the pediatric population has demonstrated improvement of symptoms in 80-93% of cases and improved overall quality of life.¹⁻³
- This study aims to evaluate pediatric FESS practice patterns in the United States and determine associations between demographics, comorbidities, procedures performed, narcotic medication use, and 30-day complication rates.

Methods and Materials

- This retrospective cohort study utilized the IBM® MarketScan® Commercial Claims and Encounters Database (Thomson Reuters Healthcare, Ann Arbor, Michigan) to capture pediatric patients (< 18 years old) who underwent FESS due to chronic rhinosinusitis from January 01, 2016, to December 31, 2018.
- All CPT codes for FESS identified patients and recorded the following data: demographics, diagnoses and surgical procedure, type and frequency of pain medications prescribed, and 30-day post-operative events (inpatient stay, complications, emergency department (ED) visits, readmissions).
- 30-day complications included the following: CSF leak, epistaxis, meningitis, septal perforation, atrophic rhinitis, pain, dehydration, acute upper respiratory infection, pneumonia, and sepsis.
- Chi-square test and t-test were used to identify the significance of categorical (chi-square) and continuous (t-test) variables on outcomes. Multiple logistic regression analyses were utilized to identify independent predictors on outcomes.

Table 1. Multivariable Logistic Regression (MLR) results of significant findings

Adjusted Odds Ratio (aOR) Estimates			
Variable	Point Estimate	95% Wald Confidence Limits	
Concomitant Adenoidectomy with FESS			
Age 13+ vs. age < 8	0.129	0.103	0.163
Cystic fibrosis (CF) vs. no CF	0.252	0.131	0.484
Sinus surgery (3 or more vs. 2 or fewer)			
Age 13+ vs. age < 8	3.865	3.127	4.779
CF vs. no CF	1.998	1.271	3.141
Allergic Rhinitis (AR) vs. no AR	1.329	1.131	1.562
Setting of surgery (inpatient vs. outpatient)			
Gender (M vs. F)	1.462	1.033	2.070
Age 13+ vs. age < 8	0.554	0.353	0.869
CF vs. no CF	6.504	4.039	10.474
AR vs. no AR	0.156	0.095	0.257
Immunodeficiency vs. none	2.673	1.271	5.621
30-day complications			
AR vs. no AR	0.698	0.559	0.872
Immunodeficiency vs. none	1.744	1.020	2.983
30-day readmissions			
Age 13+ vs. age < 8	0.577	0.376	0.887
CF vs. no CF	6.668	4.224	10.528
AR vs. no AR	0.244	0.162	0.368
Immunodeficiency vs. none	2.993	1.519	5.895
30-day ED visit			
AR vs. No AR	0.702	0.509	0.968
Asthma vs. no asthma	2.278	1.442	3.599

Table 2. Significant MLR results of narcotic use

Adjusted Odds Ratio (aOR) Estimates			
Variable	Point Estimate	95% Wald Confidence Limits	
Narcotics use within 90 days postoperatively			
Age 13+ vs. age < 8	2.363	1.586	3.520
AR vs. No AR	0.772	0.601	0.992
Immunodeficiency vs. none	2.594	1.465	4.595
30-day complications			
Narcotic use vs. none	1.870	1.375	2.542
30-day readmissions			
Narcotic use vs. none	2.450	1.590	3.775
30-day ED visit			
Narcotic use vs. none	2.684	1.810	3.978

Results

- 2,981 patients who met criteria for inclusion.
- Greater surgical extent:
 - Multivariate analysis showed the following factors to increase likelihood of having more extensive sinus surgery (≥ 3 sinuses): children 13 years and older, those with Allergic Rhinitis (AR) or Cystic Fibrosis (CF).
- Adenoidectomy:
 - Concomitant adenoidectomy was performed in 25.7% of patients and was less likely to be performed in those children ≥ 13 years and those with CF.
- Inpatient needs:
 - Males, children with CF, and children with an immunodeficiency were more likely to have an inpatient FESS.
- Complications:
 - Overall, of the 179 patients that had an ED visit, 179 (6%) additional patients were readmitted to the hospital, and 292 (13.2%) suffered a complication within 30-days postoperatively.
 - Older children (≥ 13 years) were less likely to have a readmission.
 - There were no differences in complication rates between age groups.
 - Children with an immunodeficiency were more likely to have a complication or be readmitted. Similarly, children with CF were more likely to be readmitted within 30-days after FESS.
- Narcotic Use
 - Narcotic medications were prescribed in 10.0% of patients and were more likely to be prescribed in children ≥ 13 years old and in certain parts of the country.
 - Narcotic use was independently associated with significantly higher rates of complications in the first 30 postoperative days, as well as ED visits, and readmissions.

Conclusion

- FESS is performed in all age groups, though older children (≥ 13 years) are more likely to have extensive surgery involving multiple sinuses.
- Children ≥ 13 years were more likely to be prescribed narcotics than younger children.
- A post-operative complication, ED visit, or readmission occurred in 19% of children, and was significantly associated with narcotic use, indicating a role for improved post-operative care to reduce morbidity in these patients.

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