Assessment of Need for Oxygen Support During Extended Recoveries for Pediatric Intracapsular Tonsillectomy and Adenoidectomy

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Abstract

Introduction: Tonsillectomy & adenoidectomy is one of the most common otolaryngology procedures performed in the United States. While most of these procedures are done on outpatient basis, existing guidelines recommend observing certain patients overnight. These patients include children under 3, medically complex children, children with severe obstructive sleep apnea, and children with morbid obesity. Data to support which patients benefit from observation is limited.

Methods: This study is a retrospective review of patients at a single pediatric tertiary care hospital who stayed overnight in the hospital following tonsillectomy and adenoidectomy surgery between January 1, 2022 to December 4, 2024. Charts were analyzed to identify which patients required oxygen supplementation overnight and which patients did not require intervention. Charts were also reviewed for demographic factors, BMI, medical comorbidities, and sleep study scores.

Results: Overall, 742 patients were kept overnight for observation based on current guidelines. 31 (4%) required oxygen supplementation for anywhere from 30 minutes to 15 hours postoperatively. Of these, 8 had been kept for age, 9 had been kept for BMI, and 9 had been kept for severe sleep apnea on sleep study. The remaining 5 were kept for a combination of those factors plus social factors. There were no historical or physical exam findings that seem to predict need for supplemental oxygen during overnight monitoring.

Conclusions: Only a very small percentage of patients kept overnight for monitoring after tonsillectomy and adenoidectomy require intervention with oxygen postoperatively. Changes in practice patterns, such as reduced use of narcotics intraoperatively and postoperatively, may have changed the landscape of pediatric tonsillectomy recovery. Guidelines on which patients will benefit from overnight observation require greater clinical evidence to limit the number of patients who are kept unnecessarily.

Introduction

According to AAO-HNSF 2019 updated clinical practice guidelines, a child is strongly recommended to stay overnight if under 3 years old, severe OSA, or both.[1] Other patient profiles that commonly merit overnight observation include comorbidities such as Down syndrome, neuromuscular disorders, chronic lung or metabolic disease, and obesity. However, there **is significant variation in practice.**[2]

Patients are observed due to **theoretical increased risk for need for respiratory intervention** following this procedure. Many patients, however, do not require any intervention during their observations period.

The goal of this study is to discern which patient conditions are associated with need for respiratory intervention overnight, to better inform which patients should be routinely admitted for observation.

Methods

- Retrospective Cohort Study of patients admitted for overnight observation following tonsillectomy and/or adenoidectomy performed by 9 pediatric otolaryngology surgeons at a single pediatric tertiary care hospital between 1/1/22 – 11/30/24
- Charts analyzed for demographic factors, BMI, medical comorbidities, sleep study scores, and reasons for overnight observation

Nemours Children's Hospital criteria for overnight observation:

- Age < 3 years
- Severe OSA, defined as obstructive apnea-hypopnea index (OAHI) > 20 events an hour and/or oxygen saturation nadir of <80%
- Preoperative oxygen requirement
- Severely obese children BMI ≥ 120% of 95%ile unless recent preop sleep study demonstrates non-severe OSA
- Down syndrome
- Neuromuscular disorder
- Complex cardiac disease
- Poor access to health care; recent viral illness
- Asthma that is not optimized
- Clinical suspicion of high risk by the clinician

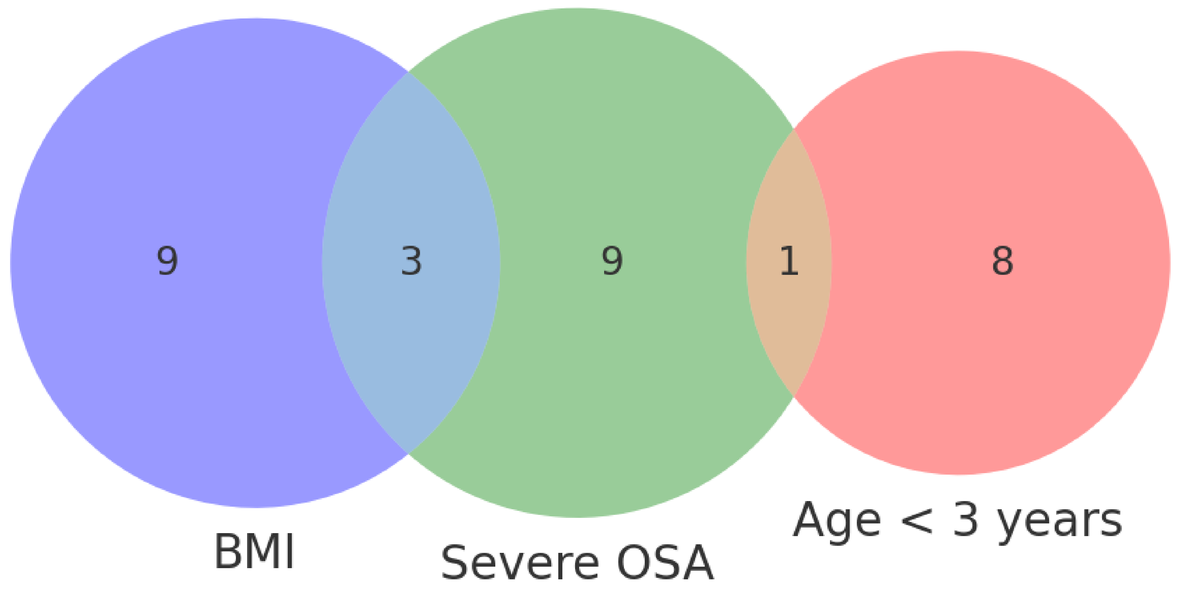
Results

- 742 patients were observed overnight following tonsillectomy and/or adenoidectomy between 1/1/22 and 11/30/24
- **31 (4%) required oxygen supplementation** from 30 minutes to 15 hours postoperatively

Table 1. Patient Demographics

	All Data (n = 742)	No Oxygen Requirement (n = 711)	Oxygen Requirement (n = 31)	Statistics
Mean Age (SD)	6 (4)	6 (4)	5 (3)	P = 0.23
Male: Female	398: 344	380: 331	18: 13	P = 0.75
Mean BMI (SD)	22 (8)	22 (8)	23 (7)	P = 0.55
Time of Year (%)				
Winter (12/21-3/20)	149 (20%)	141 (20%)	8 (26%)	
Spring (3/21-6/20)	177 (24%)	168 (24%	9 (29%)	
Summer (6/21-9/20)	220 (30%)	215 (30%)	5 (16%)	P = 0.40
Fall (9/21-12/20)	196 (26%)	187 (26%)	9 (29%)	

Indications for Overnight Stay in Patients with Oxygen Requirement Overnight



Discussion

- Only 4% of the patients of those who met the guidelines for overnight observation required oxygen supplementation overnight
- There was no significant different in age, sex, BMI, or time of year between those with and without an oxygen requirement overnight
- Age, BMI, and severe OSA appear to be the greatest risk for need for overnight oxygen requirement. We may consider decreasing our institutional criteria to reflect these findings.

References

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2. Baugh RF, Archer SM, Mitchell RB, Rosenfeld RM, Amin R, Burns JJ, et al. Clinical Practice Guideline: Tonsillectomy in Children. *Otolaryngology–Head and Neck Surgery*. 2011;144(1 Suppl):S1-S30.