



## Differences in postoperative maladaptive behavioral changes between partial and total tonsillectomy patients

Yi Cai<sup>a,b</sup>, Lindsay Lopata<sup>b</sup>, Sonam Dodhia<sup>a</sup>, Matthew Monteleone<sup>b</sup>, Joseph Haddad Jr.<sup>a</sup>, Lena S. Sun<sup>b,c,\*</sup>

<sup>a</sup> Department of Otolaryngology-Head and Neck Surgery, Columbia University Medical Center, New York, NY, United States

<sup>b</sup> Department of Anesthesiology, Columbia University Medical Center, New York, NY, United States

<sup>c</sup> Department of Pediatrics, Columbia University Medical Center, New York, NY, United States

### ARTICLE INFO

#### Keywords:

Pediatric  
Tonsillectomy  
Partial tonsillectomy  
Behavior  
Postoperative pain  
Maladaptive behavioral changes  
Tonsillectomy

### ABSTRACT

**Introduction:** Behavioral difficulties associated with sleep-disordered breathing (SDB) improve after tonsillectomy, but surgery may lead to the development of short-term postoperative maladaptive behavioral changes (PMBCs). These PMBCs have not been compared between total and partial tonsillectomy patients.

**Methods:** SDB patients aged 1–6 years undergoing tonsillectomy were recruited. Parent phone surveys were conducted at 48–72 hours and 1–2 weeks postoperatively. Parents identified PMBCs using the Post-Hospital Behavior Questionnaire (PHBQ), scoring changes in behavior compared to baseline. PMBCs were defined by PHBQ scores > 0 and compared by one-tailed *t*-test. Postoperative pain was categorized as mild, moderate, and severe pain using the Parents' Postoperative Pain Measure (PPPM). Differences in pain levels were analyzed by Chi-squared test. A *p*-value < 0.05 was deemed statistically significant.

**Results:** Seventy-eight children completed the study, with 29 total tonsillectomy and 49 partial tonsillectomy patients. At both time points after surgery, PHBQ scores were higher in total tonsillectomy patients than in partial tonsillectomy patients ( $3.41 \pm 3.53$  versus  $1.94 \pm 2.25$  at 2–3 days, *p* = .013). PMBCs were also more frequent in total than partial tonsillectomy patients (76% versus 59% at 2–3 days; 28% versus 7% at 1–2 weeks). Meanwhile, distribution of pain levels was similar between both partial and total tonsillectomy patients.

**Conclusions:** Our study indicates that total tonsillectomy patients more frequently experience PMBCs than do partial tonsillectomy patients despite similar distributions in pain levels postoperatively. This difference in PHBQ scores between total and partial tonsillectomy patients should be further explored.

### 1. Introduction

Sleep-disordered breathing (SDB) is one of the most common indications for pediatric tonsillectomy [1]. In children, SDB is associated with various behavioral difficulties and cognitive impairments such as hyperactivity, aggression, anxiety, reduced concentration, and lower IQ scores [2–5]. Improvements in behavioral problems and quality of life have been shown to occur after tonsillectomy as early as at 3–6 months' follow up [3,6–8].

Though tonsillectomy may improve SDB-related behavioral changes, the surgical experience has also been associated with the development of maladaptive behavioral changes – such as in eating, sleeping, and temperament – within the days and weeks after surgery [9]. These postoperative maladaptive behavioral changes (PMBCs) adversely affect the overall postoperative experience and parental satisfaction [10–12]. PMBCs have many different contributing factors, of

which postoperative pain has been suggested as an important contributor, and possibly a causal factor [13,14]. Other important factors such as age, emotional disturbances, and anxiety have also been shown to increase the incidence of PMBCs in pediatric patients following surgery [13–15].

Few studies have specifically characterized the PMBCs that occur following pediatric tonsillectomies. In recent years, studies have shown that children who undergo partial (intracapsular) tonsillectomies may have reduced postoperative morbidity in hemorrhage rates, pain, and return to activity [16–20]. Meanwhile, partial and total tonsillectomy patients have been shown to have similar improvements in quality of life, upper-airway obstructive symptoms, and SDB-related behavioral changes at 6 months after surgery [6,7,21]. However, no prior studies have compared PMBCs between total and partial tonsillectomy patients. Additional differences in the postoperative experience between pediatric partial and total tonsillectomy patients should be investigated and

\* Corresponding author. Columbia University Medical Center, 622 W 168th St, CH 4-440 N, New York, NY 10032, United States.  
E-mail address: [lss4@columbia.edu](mailto:lss4@columbia.edu) (L.S. Sun).

**Table 1**  
Demographic and perioperative characteristics of the tonsillectomy patients (n = 78).

	Total tonsillectomy	Partial tonsillectomy
Number of patients	29	49
Age, mean ± SD	4.8 ± 1.3 years	4.4 ± 1.4 years
Intraoperative pain medication dose <sup>a</sup> , mean ± SD	0.227 ± 0.102 mg/kg	0.227 ± 0.102 mg/kg
<b>Patient sex, n (%)</b>		
Male	15 (52%)	32 (65%)
Female	14 (48%)	17 (35%)
<b>Cases and instrumentation, n (%)</b>		
Surgeon 1	Plasma Knife, 14 (48%)	Microdebrider, 24 (49%)
Surgeon 2	Electrocautery, 8 (28%)	Microdebrider, 5 (10%)
Surgeon 3	Electrocautery, 7 (24%)	Microdebrider, 20 (41%)

<sup>a</sup> Expressed in milligrams per kilogram (mg/kg) of morphine equivalents.

may inform selection of operative technique.

The purpose of this study was to compare PMBCs between children who underwent total and partial tonsillectomy in the two weeks following surgery. We hypothesized that there would be a lower incidence and shorter duration of PMBCs in partial tonsillectomy patients than in total tonsillectomy patients. We have previously studied the post-operative experiences of healthy pre-school age patients undergoing ambulatory surgery at our tertiary center for various subspecialties (including otolaryngologic, urologic, orthopedic, plastic, and general surgery) [22]. In this study, we conducted a detailed analysis of the subset of patients who underwent tonsillectomy from this ambulatory surgical cohort.

## 2. Methods

This study was approved by the Columbia University Medical Center Institutional Review Board, and informed written consent was obtained from parents of all participants. Our original study included female and male patients ages 1–6 years who were American Society of Anesthesiologists (ASA) physical status I or II undergoing surgery during a 10-month period. For this study, we focused on children affected by SDB undergoing tonsillectomy. A concurrent history of tonsillitis was not an exclusion criterion.

Patient demographics and perioperative data were collected on the day of surgery and confirmed by review of patient records. All intraoperative opioid medications were expressed as milligrams per kilogram and converted to total morphine equivalents in dose per kilogram using the following conversion factors: 0.1 for fentanyl, 5 for hydromorphone, 0.05 for remifentanyl, and 1 for morphine.

After discharge, parents/caregivers were interviewed about their child's behavioral and pain experiences by telephone using the Post-Hospital Behavior Questionnaire (PHBQ) and Parents Postoperative Pain Measure (PPPM). Parent interviews were conducted at both 2–3 days and 8–12 days per parent availability after discharge. Responses recorded at 2–3 days were considered short-term follow-up and responses at 8–12 days (denoted 1–2 weeks) were considered late follow-up.

### 2.1. Behavior and pain measure tools

The PHBQ is a widely used and validated questionnaire to score behavioral changes in children after hospitalization or operations [23,24]. The 27-item questionnaire has questions in six subcategories: apathy and withdrawal, aggression toward authority, general anxiety, separation anxiety, eating disturbance, and sleep anxiety (Supplementary Table 1). The PHBQ items were scored on a 5-point Likert scale grading how much the child exhibited a behavior post-operatively compared to at baseline (1 = much less than before, 3 = same as before, 5 = much more than before). Each item rated by parents as a 4 or 5 contributed one point to the overall PHBQ score,

ranging from 0 to 27. A score above 0 signifies the presence of PMBCs. PHBQ scores were compared by one-tailed *t*-test, and  $p < .05$  was deemed statistically significant.

The PPPM is a 15-item questionnaire, with each item corresponding to a score of 1 if positive (Supplementary Table 2). This tool has been well validated with good internal consistency in children 1–12 years [15,25]. In our study, a PPPM score of 0 was interpreted as no post-operative pain. Scores of 1–4, 5–9, and  $\geq 10$  were defined as mild, moderate, and severe pain, respectively. Differences in pain levels between total and partial tonsillectomy patients were analyzed by Chi-squared test.

## 3. Results

A total of 82 tonsillectomy patients were enrolled, but 4 were lost to follow-up (i.e. were unable to be reached by telephone). Thus, 78 were included in the analysis for the study. Of the 29 SDB patients undergoing total tonsillectomy, nine also carried a diagnosis of tonsillitis, including recurrent streptococcal tonsillitis. The demographic and perioperative characteristics for the 78 patients are shown in Table 1. Surgeon 1 used the plasma knife for total tonsillectomies, while Surgeons 2 and 3 used monopolar electrocautery. All three surgeons used the microdebrider for partial tonsillectomies. Average intraoperative pain medication doses were both  $0.23 \pm 0.10$  mg/kg for the two groups when expressed in dose per kilogram.

There were differences in PHBQ scores and their distribution between the total and partial tonsillectomy patients at both 2–3 days and 1–2 weeks post-discharge. The distributions of PHBQ scores at 2–3 days and 1–2 weeks post-discharge are shown in Figs. 1 and 2, respectively. At 2–3 days after surgery, PHBQ scores were higher in total tonsillectomy patients ( $3.41 \pm 3.53$ , mean  $\pm$  SD) than in partial tonsillectomy patients ( $1.94 \pm 2.25$ ) ( $p = .013$ ). At 2–3 days post-discharge, 76% (22/29) of total tonsillectomy patients had PMBCs, compared to 59% (29/49) of partial tonsillectomy patients. In addition, 21% (6/29) of the total tonsillectomy patients had PHBQ scores of 7 or higher while only 4% (2/49) partial tonsillectomy patients had scores above 7. At 1–2 week follow-up, 28% of total tonsillectomy patients had PMBCs, compared to 7% for partial tonsillectomy patients. The average PHBQ scores at 1–2 weeks were  $1.28 \pm 2.90$  and  $0.27 \pm 1.13$  for total and partial tonsillectomy patients, respectively ( $p = .016$ ). At 1–2 weeks post-discharge, 2/29 total tonsillectomy patients continued to report PHBQ scores above 7, but none of the partial tonsillectomy patients had PHBQ scores above 1. Of note, we also conducted a sensitivity analysis of patient PHBQ scores using one-tailed *t*-test that excluded patients with tonsillitis from the total tonsillectomy group, which did not change our results.

Postoperative pain was also assessed, as pain may influence behavioral changes. The distributions of pain levels in total and partial tonsillectomy patients at 2–3 days and 1–2 weeks post-discharge are shown in Table 2. The majority of patients experienced some degree of

Download English Version:

<https://daneshyari.com/en/article/8806363>

Download Persian Version:

<https://daneshyari.com/article/8806363>

[Daneshyari.com](https://daneshyari.com)