

## **Incidence and Potential Risk Factors of Post-Tonsillectomy Hemorrhage**

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### **ABSTRACT**

**Objective:** To evaluate the incidence of postoperative tonsillectomy hemorrhage (PTH) and to identify the possible risk factors associated with its occurrence.

**Design:** A Retrospective Study.

**Setting:** Two private hospitals: Mahayel Hospital and Saudi German Hospital.

**Method:** Four hundred seventy-seven patients had tonsillectomy or adenotonsillectomy from January 2008 to December 2013. All PTH incidents were identified. A data collection sheet was constructed by the author, which included patient's age, sex, and day of postoperative bleeding evaluation.

**Result:** Two hundred eighty-eight (60.4%) were children and 189 (39.6%) were adults. Two hundred forty-two (50.7%) were males. The indication for tonsillectomy in 394 (82.6%) was recurrent tonsillitis and in 83 (17.4%) was obstructive sleep apnea. Twenty-nine (6.1%) patients had PTH, 8 (27.6%) had primary PTH and 21 (72.4%) had secondary. The incidence of PTH was significantly higher among adult patients than children (9%, 4.2%, respectively,  $p=0.031$ ) and among patients with recurrent tonsillitis than those with obstructive sleep apnea (7.1%, 1.2%, respectively,  $p=0.041$ ). There were no statistically significant differences in timing of PTH (primary or secondary) according to patients' characteristics.

**Conclusion:** The incidence of PTH in our study is not high. Risk factors include older age and preoperative recurrent tonsillitis. PTH occurs mainly 24 hours postoperatively. Awareness of these risk factors should help improve patient care and outcomes.

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### **INTRODUCTION**

Tonsillectomy is a common surgical procedure done by otolaryngologists. Several new surgical techniques have been developed to replace the abandoned old guillotine. These new techniques appear fashionable and relatively easy causing a drift from the conventional cold steel dissection, which reigned over time following the reported shortcomings of the guillotine<sup>1</sup>.

Tonsillectomy is a relatively simple procedure. However, a number of postoperative complications have been well-documented in the literature; the most common and potentially life-threatening is post-tonsillectomy hemorrhage (PTH)<sup>2</sup>. Considering that it is an elective procedure, it is often connected with a comparatively high bleeding rate. Furthermore, bleeding in this location (the upper airways) always represents a significant risk<sup>3</sup>.

PTH occurs at a rate between 0.28% and 20%. This wide range may reflect the diversity in the otolaryngological community on how to properly define significant PTH<sup>4</sup>.

The aim of this study is to evaluate the incidence of PTH and to identify the possible risk factors associated with its occurrence.

## METHOD

Four hundred seventy-seven patients were included in the study between January 2008 and December 2013. The author performed all surgical procedures.

Indications for tonsillectomy were either recurrent tonsillitis or obstructive sleep apnea. Patients who had chronic diseases received medications that would affect blood clotting, and those with abnormal preoperative clotting studies were not included in this study.

All patients were admitted on the same day of surgery and were discharged on the next day. Postoperatively, they received the same medications (antibiotics and analgesics) and were scheduled to come to the clinic on the 6th postoperative day.

Each patient received general endotracheal anesthesia with tonsillar exposure provided by a Crowe-Davis mouth gag. Surgical procedures were performed using the technique of electrocautery dissection of the tonsils followed by final hemostatic control of the tonsillar fossa. Prior to anesthetic reversal, patient received gastric and oropharyngeal suction and the tonsillar fossa was reexamined for bleeding.

All postoperative tonsillectomy hemorrhage incidents were identified. Data collected included patient's age, sex, and day of postoperative bleeding.

To determine statistical significance, chi-squared analysis was performed. Statistical significance was set at  $P < 0.05$ .

## RESULT

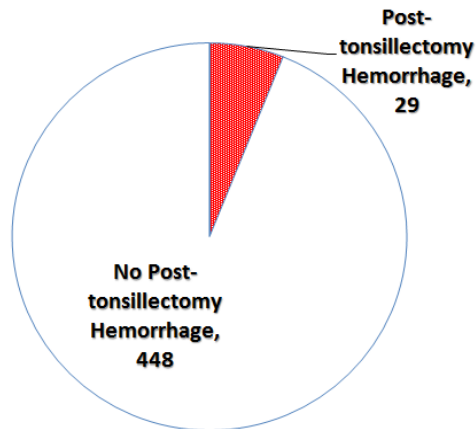
Two hundred eighty-eight (60.4%) were children (age range 2-18 years) and 189 (39.6%) were adults (age range 19-68 years). Two hundred forty-two (50.7%) were males. Three hundred ninety-four (82.6%) were suffering from recurrent tonsillitis and eighty-three (17.4%) patients were suffering from obstructive sleep apnea, see table 1.

**Table 1: Characteristics of Patients**

Patients' Characteristics		Number and Percentage
Age Groups	0-18 Years	288 (60.4)
	>18 Years	189 (39.6)
	<b>Total</b>	<b>477 (100.0)</b>
Gender	Male	242 (50.7)

	Female	235 (49.3)
	<b>Total</b>	<b>477 (100.0)</b>
<b>Indication for Tonsillectomy</b>	Obstructive Sleep Apnea	83 (17.4)
	Recurrent Tonsillitis	394 (82.6)
	<b>Total</b>	<b>477 (100.0)</b>

Twenty-nine (6.1%) patients had PTH, see figure 1; 8 (27.6%) had primary PTH within 24 hours of surgery and 21 (72.4%) had secondary PTH more than 24 hours after tonsillectomy.



**Figure 1: Post-Tonsillectomy Hemorrhage**

Incidence of post-tonsillectomy hemorrhage was significantly higher among adult patients than children (9%, 4.2%, respectively,  $p=0.031$ ) and among patients with recurrent tonsillitis than those with obstructive sleep apnea (7.1%, 1.2%, respectively,  $p=0.041$ ). However, the incidence was lower among male than female patients (5.4%, 6.8%, respectively), no statistical significance, see table 2. On the other hand, there were no statistically significant differences in timings of PTH (primary or secondary) according to patients' characteristics, see table 3.

**Table 2: Post-Tonsillectomy Hemorrhage According to Patients' Characteristics**

Patients' Characteristics	No post-tonsillectomy hemorrhage		Post-tonsillectomy hemorrhage		P Value
	Count	Percentage	Count	Percentage	
<b>Age groups</b>	0-18 years	276	12	4.4%	0.31
	>18 years	172	17	9.9%	
	<b>Total</b>	<b>448</b>	<b>29</b>	<b>6.5%</b>	
<b>Gender</b>	Male	229	13	5.7%	0.512
	Female	219	16	7.3%	
	<b>Total</b>	<b>448</b>	<b>29</b>	<b>6.5%</b>	
<b>Indication for tonsillectomy</b>	Obstructive sleep apnea	82	1	1.2%	0.41
	Recurrent tonsillitis	366	28	7.6%	
	<b>Total</b>	<b>448</b>	<b>29</b>	<b>6.5%</b>	

**Table 3: Primary and Secondary Post-Tonsillectomy Hemorrhage**

Patients' characteristics		Primary (N=8)	Secondary (N=21)	P Value
Age Groups	0-18 Years	4	8	0.561
	> 18 Years	4	13	
	<b>Total</b>	<b>8</b>	<b>21</b>	
Gender	Male	5	8	0.238
	Female	3	13	
	<b>Total</b>	<b>8</b>	<b>21</b>	
Indication for Tonsillectomy	Obstructive sleep apnea	1	0	0.100
	Recurrent tonsillitis	7	21	
	<b>Total</b>	<b>8</b>	<b>21</b>	

## DISCUSSION

Though the incidence of post-tonsillectomy hemorrhage (PTH) is quite low, it is considered the most serious complication of tonsillectomy<sup>5-9</sup>. This serious complication has been found to affect 6.1% of patients in the present study. There are great differences in the reported incidence rates of PTH, ranging between 0.28% and 20%<sup>4,10</sup>.

The main indication for tonsillectomy in our patients was recurrent tonsillitis while cases with obstructive sleep apnea constituted less than one-fifth of the patients. Schnoor et al and Stalfors et al reported that indications for tonsillectomy include predominantly obstructive sleep apnea in the pediatric age group, while recurrent tonsillitis was more common in older children and adults<sup>11,12</sup>.

Our study showed no significant difference in incidence of PTH according to patient's sex, while it was higher among adult patients than children and also among patients with recurrent tonsillitis than those with obstructive sleep apnea.

Our findings are similar to those of Perkins et al who reported that younger tonsillectomy patients were associated with fewer hemorrhages and patients with obstructive sleep apnea are less likely to have PTH than patients with chronic tonsillitis<sup>13</sup>. Similarly, Windfuhr and Chen reported that PTH occurred significantly more often among adults than children<sup>14</sup>. However, in disagreement with results of the present study, they reported that PTH was significantly more common in males. Windfuhr et al added that male patients, older age and a history of recurrent tonsillitis are identified risk factors for PTH<sup>15</sup>.

This study revealed that secondary PTH occurred more than primary PTH. There were no significant differences in timing of PTH according to patients' sex, age or reason for tonsillectomy. Senska et al found that nearly all incidents of PTH occur later than 24 hours after surgery. Conversely, Windfuhr et al found that most PTH occurs as a primary hemorrhage within the first 24 hours<sup>15,16</sup>.

The variations in reported results by different researchers may be due to difference in patient's characteristics or surgical procedures. Windfuhr noted that primary PTH is significantly more common among adults than children. Senska et al added that early onset of bleeding is a consequence of poor quality surgery and more hazardous than secondary bleeding<sup>3,14</sup>.

## CONCLUSION

**In this study, incidence of PTH is not high. Risk factors include older age and preoperative recurrent tonsillitis. PTH occurs mainly after 24 hours postoperatively. Awareness of these risk factors should help improve patient care and outcomes.**

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**Potential Conflicts of Interest:** None.

**Competing Interest:** None.

**Sponsorship:** None.

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**Ethical Approval:** Research and Ethical Committee of the College of Medicine, King Khalid University.

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