

# Prolonging Postoperative Hospitalization in Patients with Recurrent Tonsillitis to Reduce the Risk of Bleeding After Tonsillectomy\*

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## ABSTRACT

**Objective:** This study aims to investigate the effect of lengthening early postoperative hospitalization on post-tonsillectomy bleeding and retrospectively analyzes patients who were operated on for a recurrent tonsillitis diagnosis.

**Materials and Methods:** The study includes a total of 92 patients who underwent a tonsillectomy for a recurrent tonsillitis diagnosis. The patients were divided into two groups: those discharged on postoperative day 1 (Group A), and those hospitalized for a more extended period (Group B). Both groups were compared in terms of bleeding after the tonsillectomy.

**Results:** In both groups, none of the patients aged 15 or under presented with post-tonsillectomy bleeding. For patients over the age of 15, no re-admission to the hospital with postoperative bleeding occurred in Group B, while 10 patients (10.9%) from Group A presented with complaints of bleeding and were re-hospitalized.

**Conclusion:** Extending the early hospitalization period to at least two days in tonsillectomies to be performed for recurrent tonsillitis, especially for late adolescents and adult patients, may reduce the likelihood of a revisit with post-tonsillectomy bleeding.

**Keywords:** Adult tonsillectomy, postoperative pain, post-tonsillectomy hemorrhage, prolonged hospitalization, recurrent tonsillitis

## INTRODUCTION

Tonsillectomies are one of the most common surgical procedures in the ear, nose, and throat (ENT) practice (1, 2). A tonsillectomy operation involves removing both tonsils entirely, as well as its capsule and the muscular wall, and is performed with or without an adenoidectomy. The main symptoms of a tonsillectomy are tonsil hypertrophy causing obstructive sleep disorders and recurrent tonsillitis (3, 4). In addition to these symptoms, tonsillectomies are also performed for those with a history of peri-tonsillar abscess; halitosis; periodic fevers with aphthous stomatitis, pharyngitis, and adenitis (PFAPA) syndrome; or malignancy (1, 5). Tonsillectomies are considered a safe procedure for outpatient surgery. However, the referral rate to emergency services is relatively high after a tonsillectomy (approximately 10-12%) due to bleeding, inability to feed orally, and pain (6, 7).

Tonsillectomy operations involve certain complications, including trauma to the teeth, larynx, pharyngeal wall, and soft palate; difficult intubation; laryngospasm; laryngeal edema; aspiration; respiratory compromise; endotracheal tube kinking; and cardiac arrest. Postoperative complications include bleeding, nausea, vomiting, pain, dehydration, referred otalgia, post-obstructive pulmonary edema, velopharyngeal insufficiency, and nasopharyngeal stenosis (8, 9). The most important complication is undoubtedly post-tonsillectomy hemorrhaging (PTH). PTH can develop on a spectrum ranging from minor self-limiting hemorrhages to massive bleeding leading to hypovolemia and death. The prevention of postoperative bleeding has been discussed with regard to many topics such as the operation method, operation season, devices used, and drugs.

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PTH that occurs within the first 24 hours is called primary hemorrhaging, while PTH that occurs later is called secondary hemorrhaging. The present study includes two groups of patients diagnosed with recurrent tonsillitis. The first group consists of patients discharged on the first postoperative day (Group A), and the second group involves those who were hospitalized for more than one day (Group B). The study retrospectively compares postoperative bleeding status and total hospital stay.

## MATERIAL AND METHODS

This retrospective study of 92 (54 females and 38 males) patients has been conducted to evaluate the hospitalization length required for surgical treatment. Patients diagnosed with recurrent tonsillitis underwent tonsillectomy operations between June 2016-January 2020. Recurrent tonsillitis was diagnosed in patients with at least two tonsillitis attacks in the outpatient clinic, and their symptoms and signs were recorded (i.e., fever, tonsil exudates, presence of a cervical lap larger than 2 cm, group A beta-hemolytic streptococcal growth in culture). The study similarly includes patients who reported having five or more attacks per year and whose other episodes have been confirmed clinically. The study includes a total of 92 patients (38 females and 54 males) between the ages of 4 and 42. All patients were operated on under general anesthesia by the same otorhinolaryngologist. Due to the study's retrospective nature, formal voluntary consent is not required.

Patients were selected whose surgeries involved using the combination of cold blade dissection and bipolar cautery coagulation as the surgical technique.

The study has the following exclusion criteria:

- tonsillectomy/adenotonsillectomy performed due to obstructive sleep disorder (136 patients excluded from the study),
- acute tonsillectomies (one patient excluded from the study),
- tonsillectomies performed with suspicion of malignancy in the presence of asymmetric tonsils (two patients excluded from the study),
- tonsillectomies performed with the indication of halitosis (four patients excluded from the study),
- tonsillectomies for PFAPA syndrome (three children excluded from the study),
- patients who underwent their tonsillectomy after a peritonsillar abscess had developed (three patients excluded from the study),
- tonsil surgeries performed within the scope of snoring surgery (seven patients excluded from the study),
- tonsillectomies performed using a technique other than the combined cold blade dissection and bipolar cautery coagulation (21 patients excluded from the study),
- patients who did not come for postoperative control on the 14th day and were not recorded (18 patients excluded from the study),
- and patients admitted to the hospital and hospitalized after revisiting with complaints other than bleeding (e.g., pain, inability to feed, dehydration, fever; nine patients excluded in this way).

All patients were administered a standard per-operative single-dose intravenous prophylactic antibiotic (ampicillin-sulbactam). All patients received intravenous fluids (0.09% NaCl isotonic / 5% dextrose-0.45% NaCl balanced fluid / 5% dextrose), pain relief support (paracetamol), and antibiotics (ampicillin-sulbactam) during the postoperative hospitalization. Movement and solid food restrictions were applied to all patients and all groups. A liquid and soft foods diet was recommended for 10 days. Also, oral antibiotic syrups were prescribed for the five days post-discharge.

The Erzurum Regional Training and Research Hospital Ethics Committee approved this single-center retrospective study (Approval No. 2020/17-182, dated Sept. 21, 2020). This study was conducted according to the latest version of the Helsinki Declaration and Guidelines for Good Clinical Practice. No patient consent was required based on the condition that the computing department had anonymized data such as names and citizenship numbers with the ethics committee's permission.

## Statistical analysis

While evaluating the study's findings, the program Statistical Package for Social Sciences (SPSS 22.0) for Windows was used for the statistical analyses. Chi-square analysis was used to compare categorical data. The suitability of the study data parameters to normal distribution was evaluated with the Kolmogorov-Smirnov test. While evaluating the data, the t-test was used in independent groups to compare the normally distributed parameters in the quantitative data, in addition to the descriptive statistical methods (mean, standard deviation, frequency, and percentage). Pearson's correlation analysis was used to compare the two-measurement data, with the level of significance being evaluated as  $p < 0.05$ .

## RESULTS

This study includes 92 patients (54 females and 38 males) who have a mean age of  $15.3 \pm 8.9$  years. According to the Brodsky tonsil staging, 27 (29.3%) patients were grade 1-2, and 65 (70.7%) were grade 3-4 and had had a history of 5-15 tonsillitis attacks per year.

Of the patients, 59 (64.1%) were hospitalized after the tonsillectomy for one day (Group A), and 33 (35.9%) for two or more days (Group B). No patient from Group B revisited

**Table 1: Comparison of the post-op hospitalization periods of the patients included in the study with socio-demographic and clinical characteristics**

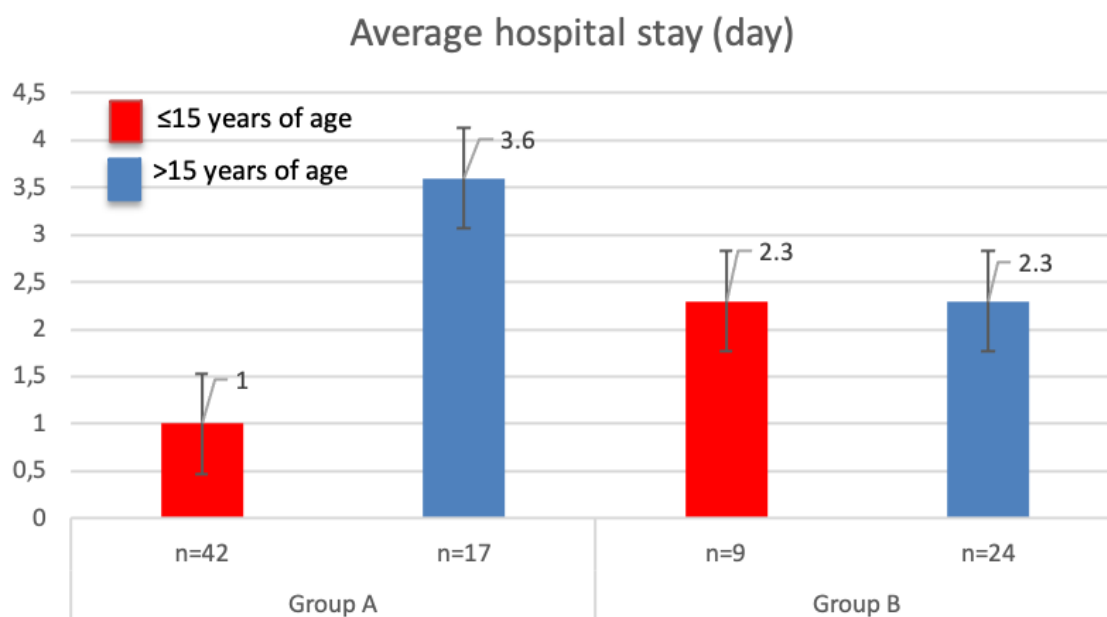
		Group A		Group B		p
		n	%	n	%	
Age		13.1±8.7		19.1±8.3		0.002 <sup>a</sup>
Gender	Female	24	40.7	14	42.4	0.870 <sup>b</sup>
	Male	35	59.3	19	57.6	
Tonsillitis attacks (per year)	5-8 times	35	59.3	19	57.6	0.344 <sup>b</sup>
	9-11 times	19	32.2	8	24.2	
	≥12	5	8.5	6	18.2	
Tonsil size	Grade 1-2	14	23.7	13	39.4	0.114 <sup>b</sup>
	Grade 3-4	45	76.3	20	60.6	
PTH	Yes	10	16.9	0	0	<b>0.012b</b>
	No	49	83.1	33	100.0	

<sup>a</sup>: T-test, <sup>b</sup>: Chi-square test, PTH: Post-tonsillectomy hemorrhage, n= Number of patients, P=Level of significance evaluated at  $p<0.05$ .

**Table 2: Relationship between tonsillitis attack and post- tonsillectomy hemorrhage status and tonsil size**

		Tonsillitis attacks						p*
		5-8 times		9-11 times		≥12		
		n	%	n	%	n	%	
PTH	Yes	3	5.6	4	14.8	3	27.3	0.062
	No	51	94.4	23	85.2	8	72.7	
Tonsil size	Grade 1-2	9	16.7	10	37.0	8	72.7	<b>0.001</b>
	Grade 3-4	45	83.3	17	63.0	3	27.3	

\*: Chi-square test, PTH= Post-tonsillectomy hemorrhage, P=Level of significance evaluated at  $p<0.05$ .

**Figure 1: Graph showing average hospitalization periods for both groups.**

the hospital with postoperative bleeding, while 10 patients (10.9%) in Group A presented with bleeding complaints and were re-hospitalized due to PTH. A comparison shows the bleeding to have been self-contained in six of the 10 patients without surgical intervention, while four required surgery (Table 1).

One of four patients was reoperated on under local anesthesia and three under general anesthesia to cauterize the focus of the bleeding. A 21-year-old male patient who started to bleed on postoperative day 4 began to bleed again in the form of leakage one day after the second operation. The patient was diagnosed with Type 1 von Willebrand disease due to the hematology consultation and was treated in the hematology clinic. No recurrent bleeding was observed in the patient after treatment with fresh frozen plasma and factor extracts. Another patient (26 years old, female) who'd been operated on with PTH had major bleeding. The patient's hemoglobin levels (15.4 g/dl preoperatively) fell to 7 g/dl after the bleeding. Two units of an erythrocyte suspension were given to the patient, who had tachycardia, palpitations, and symptoms of anemia. No death was observed in the patients.

The postoperative re-hospitalization rate with PTH was significantly higher in group A than in group B ( $p=0.012$ ). No significant difference occurred with respect to gender and postoperative hospitalization time, number of tonsillitis attacks, or tonsil size ( $p>0.05$ ; Table 1).

Patients with 12 or more tonsillitis attacks had a significantly higher incidence of Grade 1-2 tonsils compared to those with 11 or fewer tonsillitis attacks ( $p=0.001$ ). No significant relationship was found between PTH and the number of tonsillitis attacks ( $p=0.062$ , Table 2).

When considering both groups, PTH did not occur in either one for those under 15 (childhood/early adolescence: 51 patients, 42 in Group A and nine in Group B). When analyzing those in

the 4- to 15-year-old age range, the average length of hospital stay for those in Group A was significantly shorter (Table 3a). Among the remaining 41 people over the age of 15 (late adolescents and adults), 24 patients were in Group B and 17 in Group A. With regard to the hospitalization statistics, when comparing the total and average length of hospital stay in this subgroup of 41 patients, Group A had significantly longer stays than Group B. The total length of the hospital stay after the first hospitalization and revisit was 61 days (Mean =  $3.6\pm 2.4$ ) for Group A (17 patients) and 55 days (Mean= $2.3\pm 0.8$ ) for Group B (24 patients;  $p=0.042$ ; see Table 3b and Figure 1).

## DISCUSSION

Tonsillectomies are the most common surgical operation (20-40%) in the ENT practice (1, 2). Tonsillectomies that had been performed for the most common throat infections in the 1970s and 1980s are now performed more frequently for obstructive sleep disorders. The complication rate for bleeding is higher in tonsillectomies performed for recurrent tonsillitis (7, 10). The study has aimed to compare the probability of bleeding in patients with recurrent tonsillitis after the tonsillectomy operation in terms of the overall postoperative hospital stay.

Recurrent tonsillitis causes vascular proliferation in the tonsils and adjacent tissues. Inflammation from each attack causes scar formation and fibrosis of the peritonsillar space during the healing period. Thus, recognizing the anatomical structures in patients with recurrent tonsillitis becomes difficult. The number and diameter of vessels in patients with recurrent tonsillitis are higher than those who have been operated on for obstructive reasons (10-13).

No signs of infection were found in patients admitted with obstructions during the dissection of the tonsils. Also, their anatomical structures could be seen more clearly, and their tonsils could be removed in a shorter time with less intraoperative bleeding. The situation described above clarifies

**Table 3a: Comparison of postoperative hospitalization length of stay in patients under 15 years of age.**

	Group A n=42	Group B n=9	p
	Mean±SD	Mean±SD	
Average length of stay in the hospital (# of days)	1.0±0	2.3±0.5	<0.001 <sup>a</sup>
Total length of stay in the hospital	42 days	22 days	

<sup>a</sup>: T-tests

**Table 3b: The comparison of postoperative hospitalization length of stay in patients above 15.**

	Group A n=17	Group B n=24	p
	Mean±SD	Mean±SD	
Average length of stay in the hospital (# of days)	3.6±2.4 days	2.3±0.8 days	0.042*
Total length of stay in the hospital	61 days	55 days	

\*: T-tests

the mechanism by which more intra-operative and PTH patients are operated on for recurrent tonsillitis compared to those with only obstructions. In addition, the increase in the number of infections in adults explains the higher possibility of developing PTH compared to children via the same mechanism. PTH rates are higher in adult tonsillectomies than in children (5). Our study found no rehospitalization admissions with PTH in children under 15 years old. The postoperative bleeding rates for acute tonsillectomies are higher than those for other tonsillectomies (13). The present study excluded acute tonsillectomies. The most common reason for post-op re-admissions was bleeding in patients with acute tonsillectomies.

Patients who applied to the emergency department or ENT polyclinics after discharge had such complaints apart from the bleeding as pain, difficulty swallowing, inability to feed, dehydration, fever, and nausea. Curtis et al.'s study on children reported that inadequate pain control and inadequate oral nutrition were the most common reasons for re-admission to the hospital after a tonsillectomy (14). Zagólski et al. stated that readmissions to a hospital with postoperative pain and dehydration complaints were lower in patients with recurrent tonsillitis than in patients who'd undergone a tonsillectomy with other symptoms (15). Bhattacharyya and Kepnes found the postoperative hospital readmission rate to be 11.6% in a multi-center study examining 7,748 adult patients undergoing tonsillectomies (6). The reoperation rate due to PTH with regard to tonsillectomies is around 1-2% (16).

In countries such as Germany and Switzerland, adults are monitored by being hospitalized for 5-7 days after a tonsillectomy. Deitmer and Neuwirth as well as Ikoma et al. suggested that extending the postoperative hospital stay to 7-8 days would better control complications (17, 18). Vyskocil et al. reported no difference in PTH in their study comparing patients discharged for one day with those hospitalized for three days (19). Their study obtained an opposite result compared to the current study. However, this may have been due to including all tonsillectomies without distinguishing the patients in terms of their diagnosis and age groups.

Secondary hemorrhages presenting with multiple PTH may have an underlying cause of undiagnosed-occult bleeding disorder. One study conducted on children found bleeding disorders to be significantly higher in children who'd been readmitted with multiple PTHs compared to those with a single PTH (20). In the current study, the diagnosis of von Willebrand disease was made after bleeding in a 21-year-old male patient had been followed up by multiple PTHs.

When comparing only the discharge times of a well-standardized patient group in this study, no PTH was observed in either group for patients under 15 years of age. Therefore, tonsillectomies can be considered an outpatient surgery for children and young adolescents, even for recurrent tonsillitis.

No bleeding was observed in any of the patients in Group B. Only the patients over 15 years of age in Group A were admitted with PTH. When considering how these patients who

were discharged after the bleeding had been brought under control, whether spontaneously or by operation, had longer hospital stays, having an initial hospitalization of at least two days leads to the conclusion that hospital facilities can be used more effectively.

Based on all these results, the adult and the adolescent patient group that had been operated on with a diagnosis of recurrent tonsillitis was hospitalized for at least 48 hours and discharged after the onset of fluid and painkiller support, effective pain control, and adequate oral nutrition. However, their overall hospitalization period was shorter compared to Group B, and the resources (e.g., healthcare personnel, emergency room, operating room, patient beds) were used more effectively. Overall, evaluating this from the patients' points of view will help them have a more comfortable early postoperative period with better pain control in the hospital.

Because of the study's retrospective nature, it has some limitations. The study's main limitation can be considered the low number of patients due to the patient groups that were removed while standardizing the data. Again, due to the study's purpose, the lack of comparing different techniques or surgeons can be considered another weakness. These constraints can be considered as new study topics for researchers.

## CONCLUSION

In conclusion, patients diagnosed with recurrent tonsillitis undergo tonsillectomies, and prolonging the hospitalization in the early postoperative period for adolescents and adults decreases the possibility of bleeding and shortens the total hospitalization period. Thus, a prospective study would be most helpful in determining whether the risk factors identified for hemorrhage in this study are valid.

**Ethics Committee Approval:** The study was carried out with the permission of the Erzurum Bölge Research and Training Hospital Ethics Committee (Date: 21.09.2020, Decision 2020/17-182).

**Informed Consent:** Because the study was designed retrospectively, no written informed consent form was obtained from patients.

**Peer Review:** Externally peer-reviewed.

**Author Contributions:** Conception/Design of Study- F.Ö.; Data Acquisition- F.Ö.; Data Analysis/Interpretation- F.Ö., E.K.Ç., F.A.; Drafting Manuscript- F.Ö., E.K.Ç., F.A.; Critical Revision of Manuscript- F.Ö., E.K.Ç., F.A.; Final Approval and Accountability- F.Ö., E.K.Ç., F.A.; Material or Technical Support- F.Ö., E.K.Ç., F.A.; Supervision- F.Ö., E.K.Ç., F.A.

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**Conflict of Interest:** The authors have no conflicts of interest to declare.

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