

## Adult tonsillectomy: relationship between indications and postoperative hemorrhage

Erişkin tonsillektomi: Endikasyonlar ve ameliyat sonrası kanama arasındaki ilişki

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**Objectives:** In this study, we aimed to determine the possible relationship between the indications for tonsillectomy in adult population and to estimate the incidence of postoperative hemorrhage.

**Patients and Methods:** Medical records of 200 adult patients who underwent tonsillectomy between January 2003 and October 2008 were retrospectively analyzed.

**Results:** The indications for adult tonsillectomy were chronic infection in 153 patients (76.5%); upper airway obstruction secondary to tonsillar hypertrophy in 37 patients (18.5%) and suspected neoplasms in 10 patients (5%). Sixteen patients (8%) had postoperative hemorrhage. Fourteen patients of 153 patients (9.2%) who underwent surgery with the indication of chronic infection and two of 37 patients (5.4%) who underwent surgery with the indication of upper airway obstruction secondary to tonsillar hypertrophy had also postoperative hemorrhage. None of the 10 patients who operated with the indication of suspected neoplasm had postoperative hemorrhage. Although the incidence of postoperative hemorrhage according to the indications of adult tonsillectomy in descending order was chronic infection (9.2%), upper airway obstruction secondary to tonsillar hypertrophy (5.4%) and suspected neoplasms (0%), it was found that the incidence of postoperative hemorrhage was not statistically significantly related to the indications for tonsillectomy.

**Conclusion:** The incidence of postoperative hemorrhage was not statistically significantly related to the indications for tonsillectomy. In addition, we believe that surgery is a more common cause of postoperative hemorrhage rather than chronic infections.

**Key Words:** Adult; indications; postoperative hemorrhage; tonsillectomy.

**Amaç:** Bu çalışmada, erişkin nüfusta tonsillektomi endikasyonları ve ameliyat sonrası kanama sıklığı arasındaki muhtemel ilişkinin belirlenmesi amaçlandı.

**Hastalar ve Yöntemler:** Ocak 2003 ve Ekim 2008 tarihleri arasında, kliniğimizde tonsillektomi yapılmış olan 200 erişkin hastanın medikal kayıtları geriye dönük olarak incelendi.

**Bulgular:** Erişkin tonsillektomi endikasyonları; 153 hastada (%76.5) kronik enfeksiyon, 37 hastada (%18.5) tonsiller hipertrofiye ikincil üst solunum yolu obstrüksiyonu ve 10 hastada (%5) şüpheli neoplazm idi. On altı hastada (%8) ameliyat sonrası kanama görüldü. Kronik enfeksiyon endikasyonu ile ameliyat edilen 153 hastanın 14'ünde (%9.2) ve tonsiller hipertrofiye ikincil üst solunum yolu obstrüksiyonu endikasyonu ile ameliyat edilen 37 hastanın ikisinde (%5.4) ameliyat sonrası kanama oldu. Şüpheli neoplazm endikasyonu ile ameliyat edilen 10 hastanın hiçbirinde ameliyat sonrası kanama olmadı. Ameliyat sonrası kanama sıklığı, erişkin tonsillektomi endikasyonları azalan sıralamaya göre; kronik enfeksiyon (%9.2), tonsiller hipertrofiye ikincil üst solunum yolu obstrüksiyonu (%5.4) ve şüpheli neoplazm (%0) olarak sıralansa da, ameliyat sonrası kanama sıklığının tonsillektomi endikasyonları ile istatistiksel olarak anlamlı bir ilişkisi olmadığı saptandı.

**Sonuç:** Ameliyat sonrası kanama sıklığının, tonsillektomi endikasyonları ile istatistiksel anlamlı bir ilişkisi bulunmadı. Bununla birlikte, kronik enfeksiyonlardan ziyade, cerrahinin ameliyat sonrası kanamaya daha fazla neden olabileceği görüşündeyiz.

**Anahtar Sözcükler:** Erişkin; endikasyonlar; ameliyat sonrası kanama; tonsillektomi.

The palatine tonsils are the main components of the immune system and tonsil infections are the one of the most frequently seen infections through the body. Although antibiotic therapy may be sufficient in the treatment of acute tonsillitis, tonsillectomy remains the treatment of choice in the management of recurrent and chronic tonsillitis.<sup>[1,2]</sup> With the usage of antibiotics, the number of tonsillectomized patients decreased dramatically.<sup>[3-5]</sup>

Tonsillectomy is one of the most frequently performed surgical procedures.<sup>[6]</sup> Although these procedures are usually performed on pediatric patients, a significant proportion of adults also undergo the procedure. Indications for tonsillectomy seem most often a treatment for chronic recurrent tonsillitis or part of surgical airway augmentation in the treatment of obstructive sleep apnea syndrome. A less common indication is the need to rule out malignancy.<sup>[6]</sup>

Usually adult tonsillectomy is recommended for patients who are persistent carriers of *streptococcal spp.* and also for patients with chronic recurrent tonsillitis.<sup>[7]</sup> Chronic tonsillitis diagnosis usually depends on the frequency and severity of episodes, but this indication may vary from one hospital to another. Less common indications for adult tonsillectomy include halitosis, chronic cryptic debris, and as a component of uvulopalatopharyngoplasty surgery for patients with obstructive sleep apnea syndrome.<sup>[8]</sup> Appropriately selected adults who undergo tonsillectomy for chronic recurrent tonsillitis require significantly lower number of antibiotics and significantly lower hospital visits for tonsillitis or pharyngitis than those who do not undergo tonsillectomy.<sup>[8]</sup>

Numerous publications exist on the indications and complications associated with pediatric tonsillectomy. But literature studies seem to lack current prevalence of indications for tonsillectomy in adults. Indications in adults likely differ from those of the pediatric population, as tonsillectomy for suspected or confirmed neoplasm is rarely performed in children but is a more frequent indication for tonsillectomy in the adult population.<sup>[9]</sup> Postoperative hemorrhage especially in the adult population is an annoying complication of tonsillectomy causing morbidity, prolonged hospitalization and usually reoperation. Taking precautions to decrease early or late

hemorrhage is quite necessary for patients and surgeons. For this reason it is very useful to assess the causes of bleeding and to determine if there is any relationship between hemorrhage and tonsillectomy indications in the adult population.

We aimed in this study to determine the relationship between postoperative hemorrhage incidence and indications for tonsillectomy in an adult population by reviewing our outcomes.

## PATIENTS AND METHODS

We retrospectively reviewed the medical records of 200 consecutive adult patients (120 males, 80 females; mean age  $31.6 \pm 8.5$  years; range 18 to 52 years) who underwent tonsillectomy alone between January 2003 and October 2008. The data collected included patient variables such as age, gender, indication for surgery and any existence of postoperative hemorrhage. Patients were excluded from the study if they were less than 18 years of age at the time of the surgery or underwent concurrent procedures at the time of tonsillectomy such as uvulopalatopharyngoplasty. Tonsillectomy was performed in all cases with dissection and snare technique. Perioperative antibiotics were given at the time of surgery. All patients received postoperative analgesics. Hemorrhage was classified as early if it occurred within the first 24 postoperative hours and late when it occurred after 24 hours.

When evaluating findings in the study, NCSS (Number Cruncher Statistical System) 2007 & PASS 2008 Statistical Software (Utah, USA) program was used for statistical analysis. One way ANOVA test is used for quantitative data and also Tukey HSD (Honestly significant difference) test was used for determining groups with significant difference. Definitive statistical methods were used for mean, frequency and standard deviation. Chi-square test was used for qualitative data. Differences were considered significant when  $p < 0.05$ .

## RESULTS

The mean age of the chronic infection patients was significantly lower than the other groups ( $p = 0.001$ ;  $p < 0.01$ ). The mean age of patients with suspected tumor was significantly higher than the other groups ( $p < 0.01$ ; Table 1).

The most common indication for surgery was chronic infection (76.5%), followed by upper airway obstruction secondary to tonsillar hypertrophy (18.5%) and suspected neoplasm (5%) (Table 2).

**Table 1.** Evaluation of age and sex according to indications

	Indications									p
	Infection			Obstruction			Suspected tumor			
	n	%	Mean±SD	n	%	Mean±SD	n	%	Mean±SD	
Age			29.15±7.37			37.16±5.90			47.70±4.50	<0.001*
Gender										
Female	43	28.1		29	78.4		8	80.0		<0.001**
Male	110	71.9		8	21.6		2	20.0		

SD: Standard deviation; \* One way ANOVA test; \*\* Chi-Square test.

We encountered postoperative hemorrhage in 16 (8%) patients (Table 2). In 10 patients (5%), postoperative hemorrhage occurred after 24 hours. In six patients (3%), postoperative hemorrhage occurred within 24 hours while 92% of patients didn't have any hemorrhage postoperatively. All of these 16 patients were taken to the operating room to control bleeding. Prolonged hospitalization, defined as hospitalization beyond 24 hours, was needed in all of these 16 patients.

Fourteen (9.2%) of the 153 patients operated on for chronic infection had postoperative hemorrhage. Two (5.4%) of the 37 patients operated on for upper airway obstruction secondary to tonsillar hypertrophy had postoperative hemorrhage. None (0%) of the 10 patients operated on for suspected neoplasm had any postoperative hemorrhage. Although the incidence of postoperative hemorrhage was arranged according to indications for adult tonsillectomy respectively as chronic infection (9.2%), upper airway obstruction secondary to tonsillar hypertrophy (5.4%), and suspected neoplasm (0%); we found that the incidence of postoperative hemorrhage didn't have any statistically significant relationship

with tonsillectomy indications (Table 3;  $p > 0.05$ ,  $p = 0.476$ ).

## DISCUSSION

When we compare adult and child tonsils, we can detect various bacteriological compositions. Antibiotic resistant profiles in adults may be responsible for the persistence of chronic infection in adulthood as an indication for tonsillectomy. When tonsillectomy core specimens rather than surface swab cultures are evaluated, differences in tonsillar bacterial composition between age groups has been reported, with a higher incidence of atypical bacteria isolated from tonsillectomy specimens from adults.<sup>[10,11]</sup> While *Streptococcus pneumoniae* causes infections primarily in children, atypical bacteria such as *Klebsiella pneumoniae* cause infections mainly in adults. The overwhelming majority of strains of *Haemophilus influenzae*, *Staphylococcus aureus* in adults may explain the higher failure rate of medical therapy for chronic tonsillitis in adults.<sup>[10]</sup> For this reason in contrast to the pediatric population we found in our study that the most common indication for tonsillectomy in adults is still chronic tonsillitis (76.5%). This finding correlates with previous literature studies.

In our study the overall incidence of hemorrhage is comparable to that of the pediatric population reported in the literature.<sup>[12]</sup> However, Hoddeson and Gourin<sup>[13]</sup> found that the incidence of complications varies depending on the indication for surgery. In their study patients who underwent surgery for infection had a higher incidence of post-tonsillectomy hemorrhage.<sup>[13,14]</sup> They stated that chronic tissue inflammation results in increased tissue friability and a higher incidence of healing complications. Our study conflicts with this study because we found that the incidence of postoperative hemorrhage didn't

**Table 2.** Distribution of tonsillectomy indications and postoperative hemorrhage

	n	%
Tonsillectomy indications		
Infection	153	76.5
Obstruction	37	18.5
Suspected tumor	10	5.0
Postoperative hemorrhage		
Bleeding (late)	10	5.0
Bleeding (early)	6	3.0
No bleeding	184	92.0

**Table 3.** Comparison of postoperative hemorrhage with tonsillectomy indications

	Tonsillectomy indications						<i>p</i>
	Infection		Obstruction		Suspected tumor		
	n	%	n	%	n	%	
Postoperative complication							
Bleeding	14	9.2	2	5.4	0	0	0.476
No bleeding	139	90.8	35	94.6	10	100	

Chi-Square test.

have any statistically significant relationship with tonsillectomy indications (Table 3;  $p > 0.05$ ,  $p = 0.476$ ). It has been suggested in previous studies that the method of tonsillectomy, specifically the use of open surgery for dissection, influences late postoperative bleeding rates<sup>[15-17]</sup> but this has not been confirmed in multiple studies or a recent randomized controlled clinical trial.<sup>[18,19]</sup> Also the authors of this study think that surgical technique has a greater influence upon bleeding rather than other causes. We performed dissection and snare technique on all patients by ligating or cauterizing all the arteries and veins even if they didn't bleed during surgery. This precaution causes much less postoperative hemorrhage incidence. Careful dissection technique and our findings support the hypothesis that surgical technique has a major influence upon bleeding when compared with chronic infections. We can presume that adult tonsils have more fibrous connections than pediatric group because of multiple chronic infections. Even this disadvantage didn't affect our outcome and supports our study.

Only six of the patients in our study had a primary post-tonsillectomy hemorrhage, defined as occurring within the first 24 hours; this is in accordance with contemporary series that demonstrate that the majority of postoperative bleeds occur after the first 24 hours after surgery.<sup>[12,16]</sup>

In contrast to the pediatric population, the most common indication for adult tonsillectomy is chronic infection. We found that the incidence of postoperative hemorrhage didn't have any statistically significant relationship with tonsillectomy indications. Also we think that surgical technique has a greater influence upon bleeding rather than chronic infections; so our priority should be on surgical technique rather than the indications to reduce the postoperative

bleeding rate. These data may provide useful information for the cause of bleeding in the adult group and by careful dissection technique we can decrease the perioperative and postoperative bleeding incidence.

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