ORIGINAL ARTICLE

Tonsillectomy Indications and Complications: 10 Years of Experience

Tonsillektomi Endikasyon ve Komplikasyonları: 10 Yıllık Deneyim

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ABSTRACT

Objective: *In this study, tonsillectomy indications and post-tonsillectomy complications were discussed in the light of the literature.*

Material and Method: *A retrospective file review of 775 patients who underwent tonsillectomy was performed between January 2014 and January 2024. Demographic data, preoperative indications, perioperative and postoperative complications of the patients were accessed from hospital records.*

Results: *Of the 775 patients who underwent tonsillectomy, 459 (59.2%) were male and 316 (40.8%) were female. Of the 630 pediatric patients, 404 (64.1%) were operated on for obstruction, 209 (33.1%) for recurrent tonsillitis, 11 (1.7%) for suspected malignancy, and 6 (0.9%) for Periodic Fever-Aphthous-Stomatitis-Pharyngitis-Adenitis (PFAPA) Syndrome. Of the 145 adult patients, 67 (46.2%) were operated on for recurrent tonsillitis, 39 (26.9%) for obstruction, 32 (22.1%) for suspected malignancy, 4 (2.7%) for peritonsillar abscess, and 3 (2.1%) for chronic caseous tonsillitis. In the postoperative period, bleeding was detected in 18 (2.8%) of 630 pediatric patients and oral intake disorder was detected in 4 (0.6%). Postoperative bleeding complications were observed in 15 (10.3%) of 145 adult patients.*

Conclusion: *In our study, obstruction was seen as the primary indication for surgical intervention in the pediatric patient group, while infectious causes were seen in the adult patient group. The most common complication was bleeding. Tonsillectomy is an operation in which good planning of surgical indications and good postoperative follow-up are important.*

Key Words: *Tonsillectomy, Indication, Complication, Bleeding*

ÖZET

Amaç: *Tonsillektomi, Kulak Burun Boğaz hekimlerinin en sık uyguladığı ameliyatlardandır. Bu çalışmada, tonsillektomi endikasyonları, tonsillektomi sonrası görülen komplikasyonlar literatür eşliğinde tartışıldı*

Yöntem ve Gereç: *Ocak 2014 ile Ocak 2024 arasında bademcik ameliyatı geçiren 775 hastanın retrospektif dosya incelemesi yapıldı. Hastaların demografik verilerine, ameliyat öncesi endikasyonlarına, ameliyat sırasındaki ve ameliyat sonrası komplikasyonlara hastane kayıtlarından ulaşıldı.*

Bulgular: *Tonsillektomi yapılan 775 hastanın 459'u (%59,2) erkek, 316'sı (%40,8) kadın idi. 630 pediatrik hastanın 404'ü (%64,1) obstrüksiyon, 209'u (%33,1) rekürren tonsillit, 11'i (%1,7) malignite şüphesi ve 6'sı (%0,9) PFAPA sendromu nedeniyle opere edildiği saptanmıştır. Yetişkin 145 hastanın 67'si (%46,2) rekürren tonsillit, 39'u (%26,9) obstrüksiyon, 32'si (%22,1) malignite şüphesi, 4'ü (%2,7) peritonsiller apse ve 3'ü (%2,1) kronik kazeöz tonsillit nedeniyle opere edildiği saptanmıştır. 630 pediatrik hastanın 18'inde (%2,8) kanama ve 4'ünde (%0,6) oral alım bozukluğu saptanmıştır.*

Sonuç: *Çalışmamızda pediatrik hasta grubunda obstrüksiyon, yetişkin hasta grubunda enfeksiyöz nedenlerin operasyon endikasyonları arasında ilk sırada olduğu görülmüştür. Komplikasyonlardan da kanama daha sık saptanmıştır. Bu ameliyatın, cerrahi endikasyonun iyi planlanmasının ve postoperatif takibin iyi yapılmasının önemli olduğu operasyonlardan biri olduğunu düşünüyoruz.*

Anahtar Kelimeler: *Tonsillektomi, Endikasyon, Komplikasyon, Kanama*

INTRODUCTION

Tonsillectomy is among the most common surgical procedures performed. Numerous studies have been conducted regarding the indications and complications associated with pediatric tonsillectomy; however, the literature on tonsillectomy in adults is limited. Tonsillectomy alone is rarely performed in children under three years of age, while adenoidectomy alone is seldom performed in individuals over 14 years of age. The rate of adenoidectomy is approximately 1.5 times higher in men than in women, whereas the rate of tonsillectomy is approximately one-third higher in women than in men (1,2) . Historically, the leading indication for tonsillectomy in the pediatric population has been recurrent/chronic tonsillitis. However, as the use of antibiotics has become more widespread, the surgical indication has shifted toward the relief of upper respiratory tract obstruction (3). In contrast to the pediatric population, the most common indication for tonsillectomy in adults is likely recurrent/chronic tonsillitis, possibly due to higher rates of antibiotic failure caused by resistant bacteria (4).

Although tonsillectomy is a frequently performed surgical procedure, its indications remain a topic of debate due to factors such as cost, impact on quality of life, postoperative complications, and potential psychological trauma. The literature has defined the accepted absolute and relative indications for tonsillectomy (5). The absolute indications include tonsil cancer, severe airway obstruction in the oropharynx due to tonsil hypertrophy, and persistent tonsil bleeding. Recurrent acute tonsillitis, chronic tonsillitis, and recurrent peritonsillar abscess or phlegmon are other relative

Table 1: Paradise Classification

Paradise Classification	
Classification	**Description**
Minimum frequency of some throat attacks	At least 7 attacks in the last year
	At least 5 attacks per year in the last 2 years
	At least 3 attacks per year in the last 3 years
At least one of the following clinical findings accompanies a sore throat attack	Fever > 38.3 °C
	Lymphadenopathy that is painful or greater than 2 cm
	Tonsillar exudate
	Culture positivity for Group A β-Hemolytic Streptococcus
Treatment	Receiving adequate antibiotic treatment with appropriate dose and duration
	Observation of all throat infection attacks by the physician and recording of their characteristics
Documentation	Observation of at least 2 attacks of throat infections described by the patient and/or relatives of patients who cannot be fully documented by the same physician and determination of the relationship between this evaluation and the initial history

indications. Additionally, the Paradise criteria have been defined for patients planned for tonsillectomy due to chronic and/or recurrent infections (6). However, the main issue in selecting patients for tonsillectomy lies in the variability of these criteria, which depend on the medical history provided by the patients and/or their families, as well as how frequently the physician evaluates the patient. This makes the indication for tonsillectomy more relative and potentially subject to change.

Although tonsillectomy is generally a safe procedure, the most common and serious complication is bleeding. Primary bleeding occurs within the first 24 hours after surgery and is rare, estimated to occur in less than 1% of patients. Secondary bleeding occurs after 24 hours and is estimated to occur in 2-4% of patients. Other common complications of tonsillectomy include pain, impaired oral intake, and dehydration. Dehydration, ear pain, fever, and edema of the uvula are also frequently encountered, but are generally less serious complications. In contrast, more serious but less common complications include atlantoaxial joint subluxation, mandibular condyle fractures, Eustachian tube injuries, velopharyngeal insufficiency, and nasopharyngeal stenosis (7, 8, 9).

In this study, we retrospectively reviewed the patients who underwent tonsillectomy and discussed the demographic information, indications, postoperative complications, and histopathological results of the patients in the light of current literature.

MATERIALS AND METHODS

The study was planned as retrospective. After obtaining approval from the local ethics committee (Meeting Number: 2024/21, Decision Number: 02), the research commenced. The study was conducted under the Helsinki Declaration and good clinical practices. In our study, we examined the files of 775 patients who underwent tonsillectomy, adenotonsillectomy. The procedures were performed in the Kahramanmaras Sutcu Imam University, Faculty of Medicine, Health Practice and Research Hospital, Ear, Nose, and Throat Diseases Clinic, between January 2014 and January 2024. The patient files were analyzed for age, sex, indications, complications requiring hospitalization, and histopathological results.

Upon reviewing the records, we found that tonsillectomy was performed for the following indications: obstruction, recurrent tonsillitis, suspicion of malignancy, chronic caseous tonsillitis, and PFAPA syndrome. A polysomnography test could not be performed on pediatric patients with obstruction, the most common indication, due to limited access to the test. However, a polysomnography test was conducted on adult patients before surgery. The Paradise criteria were used for surgical indications for recurrent tonsillitis (Table 1).

The pathological results of the tonsillectomy specimens were examined and classified as either benign or malignant. The complications observed post-tonsillectomy were classified according to the file records. Postoperative bleeding was categorized as primary or secondary based on the timing of occurrence. Additionally, bleeding complications were further categorized according to the need for reoperation.

Statistics

IBM SPSS Statistics 20 (Statistical Package for Social Sciences v.21, IBM, Chicago, IL) program was used to calculate statistical data. Mean, standard deviation, minimum, and maximum values are given in descriptive statistics for the data.

RESULTS

Of the 775 patients who underwent tonsillectomy, 459 (59.2%) were male and 316 (40.8%) were female. The mean age of male patients was 11.4 years, while the mean age of female patients was 11.8 years, resulting in an overall mean age of 11.6 years. The youngest patient who underwent tonsillectomy was 11 months old, while the oldest was 81 years old. 630 patients (81.3%) were under 18, with an mean age of 6.1

Table 2: Demographic Distributions of Patients Included in the Study

Demographic Distributions of Patients		
	Number of Patients / Percentage	**Mean Age(Years)**
Total	775	11.6
Male	459 / 59.2%	11.4
Female	316 / 40.8%	11.8
< 18 age	630 / 81.3%	6.1
>18 age	145 / 18.7%	34.6

Table 3: Surgical indications, complications and pathology results of the patients

		Results			
		< 18 age		>18 age	
		Number	%	Number	%
Indication	Obstruction	404	64.1	39	26.9
	Recurrent Tonsillitis	209	33.1	67	46.2
	Suspicion of Malignancy	11	1.7	32	22.1
	Peritonsillar Abscess	0	0	4	2.7
	Chronic Caseous Tonsillitis	0	0	3	2.1
	PFAPA	6	0.9	0	0
Complication	Bleeding	18	2.8	15	10.3
	Oral Intake Disorder	4	0.6	0	0
Histopathological Result	Benign	630	100	136	93.8
	Malign	0	0	9	6.2

years. The number of patients aged 18 years and older was 145 (18.7%), with an mean age of 34.6 years (Table 2).

Regarding the surgical indications for our patients, 404 (64.1%) of the 630 pediatric patients under 18 underwent surgery for obstruction, 209 (33.1%) for recurrent tonsillitis, 11 (1.7%) for suspected malignancy, and 6 (0.9%) for PFAPA syndrome. Among the 145 adult patients aged 18 and over, 67 (46.2%) underwent surgery for recurrent tonsillitis, 39 (26.9%) for obstruction, 32 (22.1%) for suspected malignancy, 4 (2.7%) for peritonsillar abscess, and 3 (2.1%) for chronic caseous tonsillitis (Table 3).

In terms of complication rates, 18 (2.8%) of our 630 pediatric patients under 18 required rehospitalization for bleeding, and 4 (0.6%) for difficulty in oral intake. Additionally, 15 (10.3%) of the 145 adult patients aged 18 and over required rehospitalization for bleeding (Table 3).

When examining the histopathological results, all 630 pediatric patients under 18 were reported as having benign pathology. Among the 145 adult patients aged 18 and over, 136 (93.8%) had benign pathology, while 9 (6.2%) had malignant pathology (Table 3).

DISCUSSION

The primary indication for tonsillectomy is to manage infectious complications caused by tonsillitis. With the introduction of oral antibiotics in the 1960s, tonsillectomy surgeries decreased, resulting in a shift in surgical indications over time (10). In 1993, Derkay observed a decrease of more than two fold in the rates of tonsillectomy ± adenoidectomy performed from 1977 to 1989 (11). Similarly, Rosenfeld et al., found that the rates of tonsillectomy ± adenoidectomy decreased from 1978 to 1986 and identified obstructive sleep disorder as the primary indication (12). In another study, 88.4% of patients who underwent tonsillectomy ± adenoidectomy did so for infection; however, by 2005, only 23.2% of these surgeries were performed for that reason (13). In our study, the most common surgical indications for tonsillectomy were obstruction and recurrent tonsillitis. Other indications included suspected malignancy, chronic caseous tonsillitis, and PFAPA syndrome.

The two most common indications for tonsillectomy ± adenoidectomy in both pediatric and adult patients are infection and obstructive sleep disorder. Although tonsillectomy ± adenoidectomy for suspected or confirmed neoplasm is rarely performed in children, it is the third most common indication in adults. In pediatric patients, obstruction has been the primary indication for several decades. In a study of pediatric patients, obstructive causes accounted for 68.7%, while infection constituted only 31.3% (14). In our study of 630 pediatric patients, the indications for tonsillectomy were as follows: obstructive causes in 404 (64.1%), chronic infection in 209 (33.1%), suspected malignancy in 11 (1.7%), and PFAPA syndrome in 6 (0.9%) (15). Our findings regarding pediatric patients were found to be consistent with this study.

In some cases, tonsillectomy is performed for diagnostic purposes due to suspected malignancy. In 1998, Beaty et al. defined conditions suggesting malignancy as "High-Risk Factors" in adult patients (15). These risk factors include cancer history, tonsil asymmetry, tonsillar hardness on palpation, visible lesions on the tonsil, accompanying neck lymphadenopathy, unexpected weight loss, and constitutional symptoms (fatigue, night sweats, fever, anorexia) (15). Erdağ et al. found in 2005 that these risk factors were also important for the pediatric population (16). A study examined tonsillectomy± adenotonsillectomy specimens and found malignancy in 0.087%. Among the 54 patients with malignancy, 48 (88%) exhibited features that raised suspicion of malignancy in the tonsil, while no suspicious features were observed in the remaining 6 patients. Those with such features represent true occult malignancy, constituting 0.011% of the total cases (17). When examining studies investigating malignancy rates in pediatric and adult patients separately, Garavello et al. examined the malignancy rates in pediatric and adult patients separately and found malignancy in only 2 (0.18%) (Burkitt's lymphoma) of the pediatric patients (18). In our study, 7 out of 630 pediatric patients (1.1%) underwent diagnostic surgery due to the presence of risk factors, and 4 (0.6%) underwent lymph node excision and tonsillectomy together because of long-term suspicious lymphadenopathy in the neck. Malignancy was not detected in any of the tonsillectomy or lymph node excision specimens obtained from pediatric patients.

Beaty et al. conducted a study in the adult population aged 18 and over in 1998, finding that malignancy was detected in 25 (5.25%) of 476 patients after tonsillectomy (15). Notably, malignancy was not found in any patient without risk factors. In our study, nine out of 145 patients (6.2%) were diagnosed with malignancy. All of our patients diagnosed with malignancy were among the 32 (28%) cases performed for diagnostic purposes. We did not detect any true occult malignancy in our study. Non-Hodgkin lymphoma was

identified in 7 out of the 9 patients (77.7%) diagnosed with malignancy. Of the two patients with other malignancies, one was reported as non-keratinizing squamous cell carcinoma, and the other was classified as atypical.

Another indication for tonsillectomy is a recurrent peritonsillar abscess. This condition is most commonly observed in adults. Treatment options for peritonsillar abscesses include antibiotics, analgesics, steroids, needle aspiration, incision and drainage, emergency tonsillectomy, and interval tonsillectomy (19). Despite the high incidence of peritonsillar abscess, there is no national or international consensus on management, and practices vary among clinics. In their meta-analysis, Mughal et al. recommended emergency tonsillectomy for three patient groups: those who are already candidates for tonsillectomy due to recurrent tonsillitis, children who cannot comply with other procedures, and cases with persistent collections that do not respond to needle aspiration and incision-drainage (20). In our study, four patients underwent interval tonsillectomy due to peritonsillar abscess, all of whom were adults. Emergency tonsillectomy was never performed due to peritonsillar abscess in our study.

Another rare indication for tonsillectomy is chronic caseous tonsillitis, characterized by the retention and/or discharge of cheese-like, semi-solid whitish crypt material. It is usually painless, with halitosis being the only symptom in approximately 78% of patients. Nonsurgical treatments for chronic caseous tonsillitis include irrigation, saline gargling, manual tonsil massage, gentle curettage, topical antiseptics, anti-inflammatories, and systemic antibiotics. Tonsillectomy may be considered for patients who do not benefit from these treatments (21). In our study, we performed tonsillectomy for chronic caseous tonsillitis in three patients.

PFAPA is an abbreviation for an idiopathic inflammatory syndrome characterized by periodic fever, adenitis, pharyngitis, and aphthous stomatitis, first described by Marshall in 1987. In PFAPA syndrome, there is recurrent high fever that occurs at regular intervals every 2-8 weeks. Onset usually occurs before the age of 6, with recovery typically taking place 3 to 5 years after onset. Although PFAPA is generally a self-limiting condition, it can impose a significant disease burden due to recurrent attacks. Oral steroids are effective in controlling symptoms but may shorten the intervals between attacks. Tonsillectomy has been found to be effective in providing remission in up to 98% of patients with PFAPA (21). In our clinic, 6 patients underwent tonsillectomy due to PFAPA, and it was observed that their quality of life improved in the postoperative period.

Although tonsillectomy is generally considered a safe surgical procedure, it can lead to serious complications such as bleeding. Bleeding after tonsillectomy is classified as primary if it occurs within the first 24 hours post-surgery, and secondary if it occurs later. In a study by Osborne et al., it was found that adults were 3.5 times more likely to undergo reoperation for bleeding control than children (22). In other study, bleeding after tonsillectomy was observed in 78 patients (3.6%). More than one bleeding episode was observed in 2 of 78 patients (2.6%) with bleeding (7). Primary bleeding was observed in only 5 patients (0.23%). Secondary bleeding was observed in 73 patients (3.4%). Bleeding control was performed in the operating room under general anesthesia in 28% of patients with bleeding. In our study, bleeding was observed in 18 of 630 pediatric patients (2.8%) and they were followed up in the ward. One of these 18 patients (5.5%) had two episodes on the 6th and 9th postoperative days. For bleeding control, four of 18 patients (22.2%) underwent surgery under general anesthesia. On average, bleeding occurred on postoperative days seven and 27. The earliest bleeding was on postoperative day four; the latest bleeding was on postoperative day 12.

In a study by Torres et al., postoperative bleeding was observed in 17 patients (5.23%) (8). It was observed that three of the 17 patients with bleeding (17.6%) had primary bleeding; 14 of them (82.35%) had secondary bleeding. Of the 17 patients who developed bleeding complications, 13 (76.47%) underwent bleeding control in the operating room under anesthesia. In our study, bleeding was observed in 15 of 145 adult patients (10.3%) and they were followed up in the ward. Of these 15 patients (13.3%), two patients had a bleeding episodes and one patient (6.6%) had three bleeding episodes. Of the 15 patients with bleeding (33.3%), 5 were taken to surgery under general anesthesia for bleeding control. On average, bleeding occurred on postoperative days 8-36. The earliest bleeding occurred on postoperative day three; the latest bleeding occurred on postoperative day 20.

Another serious complication after tonsillectomy is impaired oral intake. Postoperative pain can lead to difficulties in eating and dehydration. Dehydration is the most common complication resulting in hospitalization after bleeding. In a study conducted by Rohlfing et al., which examined 473 pediatric patients, complications such as nausea, vomiting, and dehydration developed in 6 patients (1.3%) (9). In our study, 4 of 630 pediatric patients (0.6%) required re-hospitalization due to impaired oral intake, and 1 of these patients (25%) needed two hospitalizations for the same reason.

In a study by Torres et al., three patients (0.92%) experienced difficulty swallowing and painful swallowing, while two patients (0.61%) required readmission due to fever (8). In our study, none of the 145 adult patients required readmission due to impaired oral intake.

Long-term complications that may arise after tonsillectomy include lung infections, velopharyngeal insufficiency, and nasopharyngeal stenosis. Lung infections are typically caused by atelectasis or aspiration of loose teeth, blood, or residual tissue (23). Velopharyngeal insufficiency is more likely to occur in patients with cleft palate or previously undiagnosed palatal abnormalities. Hypernasality usually resolves spontaneously after surgery; therefore, follow-up is required for up to eight weeks. If symptoms persist, speech therapy and conservative treatments are recommended. If there is no improvement within 6 to 12 months, surgical intervention may be indicated (24). Nasopharyngeal stenosis, a rare complication of adenotonsillectomy, occurs as fresh mucosal surfaces approach each other during the healing process (25). None of these long-term complications were observed in our study.

CONCLUSION

Tonsillectomy is one of the most frequently performed surgeries worldwide. With the intensive use of antibiotics, more care should be taken when selecting patients in order to achieve the expected decrease in the number of operations performed for chronic and/or recurrent infection indications. In addition, it is important for patients to be followed up by the clinician for a while before deciding to operate. As a result, we believe that it is extremely important to pay attention to the recommendations emphasized in the relevant guidelines and studies during tonsil surgery in order to prevent complications.

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