

# Risk factors for nasal septal perforation after septoplasty operation

## Septoplasti sonrası nazal septal perforasyonlardaki risk faktörleri

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### Abstract

**Aim:** Nasal septal perforation is the most common complication in the long term after septoplasty. Nasal septal perforation is the partial opening of the wall between both nasal cavities. In this study, we will evaluate the causes of septal perforation after septoplasty.

**Methods:** 400 patients aged between 18 and 50 years who underwent septoplasty operation in Otorhinolaryngology clinic between 2016 and 2019 were evaluated. The study was performed as a retrospective cohort. These patients were divided into groups with and without perforation. Patients with perforation were evaluated in terms of age, gender, alcohol and cigarette use, and stabilization technique used in surgery.

**Results:** There were 280 male and 120 female patients in the study. 378 patients had no postoperative septal perforation. 22 had perforation after surgery. 19 of the patients in the perforated group were male and 3 were female. Male sex ratio was significantly dominant in perforated patients (19/3) ( $P=0.022$ ). 21 of the patients were smoking and 1 patient was not drinking. ( $P=0.012$ ). 11 of these patients were drinking alcohol and 10 of them did not drink alcohol. To stabilize the septum in patients with perforation while transseptal suture + nasal splint was used in 14 patients, only nasal splint was used in 8 patients. The perforation rate after surgery was 22/400 (1.3%) (21/1) ( $P=0.012$ ). There was no significant difference in the perforation rate among the patients with alcohol intake ( $P=0.082$ ). There was significant difference between the methods used to stabilize the septum. The rate of perforation was significantly increased in patients who underwent transseptal suture ( $P=0.023$ ).

**Conclusion:** Patients with perforation after septoplasty were found to increase the risk of perforation by male sex, smoking and surgical technique as transseptal suturing technique.

**Keywords:** Nasal septal perforation, Septoplasty, Suture, Smoking

### Öz

**Amaç:** Septoplastinin sonrası uzun dönemde en sık görülen komplikasyon nazal septal perforasyonudur. Nazal septal perforasyon her iki nazal kavite arasındaki duvarın kısmen açılmasıdır. Bu çalışmamızda septoplasti sonrası ortaya çıkan septal perforasyonun nedenlerini inceleyeceğiz.

**Yöntemler:** Çalışma için 2016-2019 yılları arasında Kulak Burun Boğaz kliniğinde septoplasti operasyonu olan 18-50 yaş arası 400 hasta incelendi. Çalışma retrospektif-kohort olarak yapıldı. Bu hastalar perforasyonu olan ve olmayan iki gruba ayrıldı. Perforasyonu olan hastaların sigara ve alkol kullanımı, cinsiyet ve septum stabilizasyonu için kullanılan teknik açısından incelendi.

**Bulgular:** Hastaların 280 i erkek ve 120 si kadındı. Hastaların 378inde cerrahi sonrası septal perforasyon yoktu. 22sinde cerrahi sonrası perforasyon mevcuttu. Perforasyon olan gruptaki hastalardan 19u erkek 3 ü bayandı. Bu hastaların 21 i sigara içerken, 1 hasta içmiyordu. Bu hastaların 11 i alkol alırken 10 u alkol almıyordu. Perfore olan hastalarda septumu stabilize etmek için 14 hastada transseptal suture + nazal doyle splint kullanılırken 8 hastada sadece nazal doyle splint kullanıldı. Yapılan cerrahi sonrası perforasyon oranı 22/400 (%1,3) idi. Perfore olan hastalarda erkek cinsiyet oranı anlamlı derecede baskındı (19/3) ( $P=0,022$ ). Perfore olan gruptaki hastalarda sigara içen grup anlamlı derecede artmıştı (21/1) ( $P=0,012$ ). Bu gruptaki hastalarda perforasyon oranı artışında, alkol alımı olanlarda anlamlı derecede farklılık izlenmedi ( $P=0,082$ ). Septumu stabilize etmek için kullanılan yöntemler arasında anlamlı farklılık izlendi ( $P=0,023$ ). Transseptal suture yapılanlarda perforasyon oranı anlamlı derecede arttı ( $P=0,036$ ).

**Sonuç:** Septoplasti sonrası perforasyonu olan hastalar incelendiğinde erkek cinsiyet, sigara kullanımı ve cerrahi teknik olarak transseptal suturenin perforasyon riskini artırdığı gözlemlendi.

**Anahtar kelimeler:** Nazal septal perforasyon, Septoplasti, Suture, Sigara içmek

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## Introduction

The nasal septum consists of the cartilage, the bone septum and the mucosal layer covering it. The bone septum consists of the vomer, the lamina perpendicular of the ethmoid bone and the maxillary crest. As a result of necrosis of the septum due to damage to these layers, there is a gap between the two nasal cavities. Therefore, the nasal airflow is disturbed and leads to deterioration in the quality of life of the patient [1].

Although the incidence of septal perforation is reported to be around 1%, it is actually much more. Septal perforations may occur due to iatrogenic, trauma, drug use (steroids, cocaine, etc.) and cauterization. The most common cause of septum surgery is secondary to infection [2].

The most common site of formation of septum perforations is the anterior region. The posterior or superior source is about 10%. Perforations in the anterior region lead to clinical symptoms, and Perforations in the posterior region do not produce much clinical signs. The most common cause of these patients is nose bleed, nasal congestion and nasal dryness. Rarely, there are complaints of sound extraction similar to whistling [1,2].

In the treatment, first of all, conservative method is observed. If the patient's complaints persist, surgical treatment is used. Topical washing, moisturizing and antibiotic creams are applied to the patient. Nasal septal buttons and endoscopic approaches are used for surgical treatment. Several flap techniques have been reported in relation to endoscopic approaches [3-5].

## Materials and methods

Four-hundred patients aged between 18 and 50 years who underwent septoplasty operation in Otorhinolaryngology Clinic between 2016 and 2019 were evaluated. The study was performed as a retrospective cohort. These patients consisted of patients with septoplasty due to nasal septal deviation. All patients underwent septoplasty with closed technique. In some patients, transseptal suture technique was used at the end of septoplasty. In the transseptal suture, 4.0 rapid vicryl was used. Nasal splints were used for all patients. These patients were divided into two groups with and without perforation. Demographic characteristics of the patients were recorded. Patients with perforation were evaluated in terms of age, gender, alcohol and cigarette use, and stabilization technique used in surgery. Approval was obtained from the local ethics committee (2015-3).

### Statistical analysis

SPSS 21.0 software (IBM, SPSS, Chicago, USA) was used for analysis. The categorical data were given as number (n) and percentage (%). Chi-square test and Mann-Whitney U test were used to compare the characteristics of the data, smoking-alcohol use and the surgical method used. Regression analysis and Odds ratio were approved for risk factors.  $P < 0.05$  was considered statistically significant.

## Results

There were 280 male and 120 female. 378 patients had no postoperative septal perforation. 22 had perforation after

surgery. Of the patients in the perforated group, 19 male and 3 female were female. Male sex ratio was significantly dominant in perforated patients (19/3) ( $P=0.022$ ). 21 of these patients were smoking and 1 patient was not drinking ( $P=0.012$ ). 11 of these patients were drinking alcohol and 10 of them did not drink alcohol. To stabilize the septum in patients with perforation while transseptal suture + nasal splint was used in 14 patients, only nasal splint was used in 8 patients. The perforation rate after surgery was 22/400 (1.3%) (21/1) ( $P=0.012$ ). There was no significant difference in the perforation rate among the patients in this group and in those with alcohol intake ( $P=0.082$ ). There was significant difference between the methods used to stabilize the septum. The rate of perforation was significantly increased in patients who underwent transseptal suture ( $P=0.023$ ) (Table 1).

Table 1: Comparison of age, gender, alcohol and cigarette use, and stabilization technique in patients with perforation

		P-value	Odds ratio
Gender	19 (Male)	0.022	6.33
	3 (Female)		
Use of smoke	21 (Smoking)	0.012	21
	1 (Non-smoking)		
Use of alcohol	11 (Drinking)	0.082	1.1
	10 (Non-drinking)		
Septum stabilization technique	14 (TSS + NS)	0.023	1.75
	8 (Only NS)		

TSS: Transseptal suture, NS: Nasal splint

## Discussion

The septum is the septic cartilage that separates the nasal cavity consisting of the bone at the back and the mucosa (mucoperikondrium, mukoperiostium) surrounding it. By providing nasal airflow from front to back, health provides a breath function. In septal perforations, this layer is primarily infected due to iatrogenic or surgical trauma, and then mucosal blood flow is impaired. Over time, small openings grow in this layer. Patients present with complaints such as nasal congestion, nasal bleeding, drying and crusting, whistling, and quality of life. Granulomatous diseases, topical drug use (steroids and cocaine), bilateral nasal cauterization, nasal tampons, and nose piercings. They are the most common anterior and rarely originate posterior and superior [6,7].

Septal perforation surgery is quite difficult. Conservative approach is recommended in the treatment. Vaseline moisturizing ointments, antibiotic ointments, postnasal drainage are the most common. Surgical treatment is used for patients who cannot relax with these methods. The most commonly used method was the nasal septal button method, and now the endoscopic flap translation method is the most common and successful treatment method. Although the nasal septal buttons have symptoms in a short time, they are not very successful in the long term. In flap methods, the success of experienced surgical hands is very high [8-10]. Generally extracorporeal technique is used in septoplasty repair [11].

Smoking and alcohol use are not required in patients undergoing nasal septum surgery. They have a negative effect on wound healing [12]. In a study conducted by Yazici et al. [13], cigarette smoking has been shown to decrease postoperative quality of life in patients undergoing septoplasty. In another study, it was observed that smoking increased the risk of perforation [14]. Increased suturing after septum surgery leads to crusting, causing infection and mucosal damage in that area of

the septum [15]. Therefore, saturation techniques for reducing crusting in septum surgery have been described. In addition, vaseline moisturizers and nasal washing are recommended. In the study on respiratory stress and complication of tamponade and septal suturation, the use of merosel buffer and smoking increased this risk [16]. In another study, no significant difference was observed between the use of tamponade and septal perforation relationship [17].

There is not much literature on the etiology of septum perforation. There are several studies suggesting that smoking increases perforation [18]. The effect of sex, alcohol use, surgical tamponade or suturation with perforation has not been investigated. In our study, a significant relationship was found between male sex and smoking and septal perforation. No significant increased risk was found in alcohol use. In the stabilization of septoplasty, the risk of septal perforation was not increased in the use of nasal tamponade alone, but the risk of septal perforation was increased in transseptal sutures.

However, the number of patients in these study groups was limited. If it is investigated in a larger population and larger patient series and can give more accurate results.

In conclusion, smoking and transseptal suturation technique are found to be risk factor for septal perforation in septum surgery.

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