

## Nasal Obstruction, Quality of Life and Comfort Level in Septorhinoplasty Patients: Six-Monthly Monitoring Study

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### ABSTRACT:

**Purpose:** The purpose of the study is to determine the nasal obstruction, quality of life, and comfort level before and after surgery in the 6<sup>th</sup> month in patients who underwent septorhinoplasty.

**Material and Methods:** The study was carried out as a pretest-posttest to determine the nasal obstruction, quality of life, and comfort level in 161 patients who underwent septorhinoplasty. Research data were collected using the Nasal Obstruction Symptom Scale, Rhinoplasty Quality of Life Scale, and Visual Analog Scale. Median, standard deviation, number, percentage, Wilcoxon Signed-Ranks test, and Spearman correlation tests were used.

**Results:** The Nasal Obstruction Symptom Scale score of the patients was 70.12±27.71 preoperatively decreased to 22.98±21.40 in the 6<sup>th</sup> month postoperatively, the Rhinoplasty Quality of Life Scale score increased from 18.68±10.06 to 70.78±19.10, the comfort level increased from 3.03±1.57 to 7.32±1.69.

**Conclusion:** The respiratory function of the patients improved, and the patient comfort and quality of life increased after septorhinoplasty. The evaluation of respiratory function, quality of life, and comfort level after septorhinoplasty will contribute to the planning of education and counseling interventions for patients and the effective management of postoperative home care.

**Keywords:** Nasal Obstruction, Quality of Life, Septorhinoplasty

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### INTRODUCTION

Septal deviation is a problem that results in a decrease in the quality of life (QoL) and comfort of individuals (Oppermann et al., 2022). Nasal obstruction related to septal deviation causes impairment in respiratory and odor function, headache, fatigue, insomnia, anxiety, depression and decreases productivity and, affects the body image (Ma et al., 2020; Oppermann et al., 2022; Taylan et al., 2021; Valsamidis et al., 2019). Septorhinoplasty is performed to improve the function and appearance of the nasal area and facial characteristics, to perform nasal functions, and to increase the comfort of life (Cingi et al., 2011; Ishii et

al., 2017; Kütük and Arıkan, 2019; Oppermann et al., 2022). Although the surgical technique and complication rates are the priority in evaluating the results of the operation in septorhinoplasty surgeries, in recent years, importance has been given to the evaluation of surgical outcomes from the patient's perspective (Dabrowska-Bien et al., 2021; Izu et al., 2012). The QoL and nasal obstruction after septorhinoplasty are the most commonly evaluated issues from the patient's perspective in septorhinoplasty surgeries and it was determined that patients reported significant improvement in respiratory function and QoL (Çelik and Altıntaş; 2019; Gerecci et al., 2019; Kalakuntla et al., 2019;

Kütük and Arıkan, 2019; Oppermann et al., 2022; Spiekermann et al., 2018; Wähmann et al., 2018; Zojaji et al., 2018). Determination of the symptoms and QoL of patients after surgery using measurement tools specific to the disease is important in preventing possible complications and increasing patient satisfaction, QoL, and comfort (Çelik and Altıntaş; 2019; Gerecci et al., 2019; Oppermann et al., 2022; Wähmann et al., 2018; Zojaji et al., 2018). There are studies evaluating the effects of septorhinoplasty on quality of life (Bulut et al., 2017; Chavan et al., 2017; Oppermann et al., 2022; Wähmann et al., 2018; Zojaji et al., 2018) and nasal obstruction (Oppermann et al., 2022; Taylan et al., 2021) and comfort (Taylan et al., 2021). However, no study was detected that simultaneously evaluates the effects of septorhinoplasty on quality of life, nasal obstruction, and comfort with measurements pre- and postoperatively. Therefore, this study was carried out to determine the nasal obstruction, QoL, and comfort level specific to the disease before and after surgery in the 6<sup>th</sup> month in patients who underwent septorhinoplasty.

## MATERIAL AND METHODS

### Purpose and Type of Study

The study was carried out as a pretest-posttest to determine the nasal obstruction, QoL, and comfort level specific to the disease in patients who underwent septorhinoplasty before and after surgery in the 6th month.

### Sampling and Participant

The sample size was determined by using the power analysis technique with the G\*Power software (G\*Power V 3.1.3 Franz Faul, Universität Kiel, Germany) (Faul et al., 2007). Given the study a power of 0.98, it was calculated that at least 161 participants were required. Therefore, the sample included all patients (n = 200) who underwent elective septorhinoplasty by the same surgeon due to septal deviation between 1 April 2019 and 1 October 2019 in the Otorhinolaryngology service of a university hospital. Patients over 18, who were cognitively competent and agreed to participate in the study were included in the study. Patients with reduced polyps or chronic sinusitis, craniofacial

anomalies, patients with active upper respiratory tract infection, and patients under 18 and over the age of 60 were excluded from the study.

The study was carried out with 161 patients since the phone number given to 20 of the 200 patients included in the study could not be reached during the posttest monitoring in the 6<sup>th</sup> month and 19 patients wanted to leave the study.

The data were collected by the second researcher using a face-to-face interview method. Preoperative data were collected in the patient room at 21:00 the day before the operation, and the phone number of the patients and the date of the interview were recorded. For posttest evaluation, the patients were called 6 months after the operation and were called to the polyclinic for examination. NOSE, ROE, and VAS were applied to the patient again after the examination. The surveys took 20-25 minutes to complete

### Data Collection Tools

Descriptive Characteristics Form, Nasal Obstruction Symptom Scale (NOSE), Rhinoplasty Quality of Life Scale (ROE), and Visual Analog Scale (VAS) were used to collect data.

*Descriptive Characteristics Form:* Form was developed by researchers based on the literature (Çelik and Altıntaş, 2019; Gerecci et al., 2019; Oppermann et al., 2022; Wähmann et al., 2018; Zojaji et al., 2018). It consists of seven questions regarding age, gender, place of residence, marital status, educational status, employment status, and the basic problem related to the nose.

*NOSE:* NOSE was developed by Stewart et al. in 2004, and the Turkish validity and reliability test were made by Karahatay et al. in 2018. In NOSE, the patient's symptoms such as swelling in the nose, breathing difficulties in the nose, difficulty in sleeping, and inability to breathe sufficiently through the nose during exercise or fatigue are evaluated. The raw values obtained here and ranging from 0 to 20 are multiplied by 5 to score between 0-100. High scores show excessive nasal obstruction (Karahatay et al., 2018). Total NOSE scores have been categorized into previously described severity ranges including mild (range, 5–25), moderate (range, 30–50), severe (range, 55–75), or extreme (range, 80–

100) (Gerecci et al., 2019). Cronbach's alpha values for the scale were found to be 0.78 in the study of Stewart et al. and 0.86 for the pretest, and 0.81 for the posttest in the study of Karahatay et al. (2018). In our study, Cronbach's alpha value was 0.92 in the pretest and 0.96 in the posttest.

**ROE:** ROE was developed by Alsarraf et al. in 2001 and the Turkish validity and reliability test were carried out by Çelik and Altıntaş in 2019. It is a scale consisting of standardized six questions and evaluated between 0 to 4 to determine the level of satisfaction with functional and aesthetic results of patients undergoing external nasal reconstruction. The score of the scale is between 0-24, the total score obtained is divided by 24 and multiplied by 100. The high score shows that patient satisfaction with nasal surgery is high (Kütük and Arıkan, 2019; Çelik and Altıntaş, 2019). Cronbach's alpha values for the scale were found between 0.57-0.81 in the original study. Cronbach's alpha values were 0.89 for the pretest and 0.80 for the posttest in Çelik and Altıntaş's study. In our study, Cronbach's alpha values were 0.703 in the pretest and 0.93 in the posttest.

**VAS:** VAS was developed in 1983 by Price et al. for chronic and experimental pain. The comfort level of the patients was evaluated using the visual analog scale (Chooi et al., 2013; Miu et al., 2019; Tosun et al., 2015). 0 means minimum comfort 10 means maximum comfort, and a high score shows a high comfort level. In our study, Cronbach's alpha values were 0.71 in the pretest and 0.78 in the posttest.

### Statistical Analysis

The data were evaluated via the SPSS 22.00 program. Median, standard deviation, number, and percentage were used as descriptive statistical methods to evaluate the data. Normal distribution data was examined using the Kolmogorov-Smirnov test. Since the data was inconsistent with the normal distribution, the Wilcoxon Signed-Ranks test was used for statistical significance and relationships between variables, and Spearman's correlation test was used to determine the relationship between preoperative and postoperative NOSE, ROE, and VAS scores. The statistical significance level was accepted as  $p < 0.05$ .

### Ethical Approval

The study was approved by the Non-Interventional Research Ethics Committee of Sivas Cumhuriyet University (2019-02/44, 20.02.2019) and written permission was obtained from the institution where the research was conducted. Verbal and written consent was obtained from the participants and confidentiality, privacy, and anonymity of the participants were ensured.

### RESULTS

The mean age of the participants was  $27.48 \pm 8.14$ , 60.2% were women, 54% were university graduates, 67.1% were single, 93.8% were living in the city and 59.6% were not working. It was determined that 65.2% of the individuals had nasal breathing problems, and 34.8% were uncomfortable with deformities (Table 1).

In the preoperative period, patients had severe nasal obstruction, quality of life and comfort level were lower. The patients' preoperative NOSE score decreased from  $70.12 \pm 27.71$  to  $22.98 \pm 21.40$ , the QoL score increased from  $18.68 \pm 10.06$  to  $70.78 \pm 19.10$ , and the comfort level increased from  $3.03 \pm 1.57$  to  $7.32 \pm 1.69$ , the differences between the scale scores in the preoperative period and the 6<sup>th</sup> month were significant (Table 2).

The preoperative NOSE score was strongly correlated with the comfort level ( $r = -0.532$ ;  $P < 0.001$ ), and weakly negatively correlated with the ROE score ( $r = -0.210$ ;  $P = 0.007$ ), and the comfort level was positively correlated with the ROE score ( $r = 0.443$ ;  $P < 0.001$ ). Postoperative NOSE score was negatively weak correlated with the comfort level ( $r = -0.275$ ;  $P < 0.001$ ) and was negatively strongly correlated with the ROE score ( $r = -0.657$ ;  $P < 0.001$ ), the comfort level was positively correlated with the ROE. It was determined that the comfort level was a positively strong relationship with the ROE score ( $r = 0.887$ ;  $P < 0.001$ ) (Table 3).

**Table 1.** Descriptive characteristics of individuals

Characteristics	n	%
<b>Gender</b>		
Female	97	60.2
Male	64	39.8
<b>Education Status</b>		
Primary school	6	3.7
High school	68	42.2
University	87	54.0
<b>Marital Status</b>		
Married	53	32.9
Single	108	67.1
<b>Place of Residence</b>		
Rural	10	6.2
City/Urban	151	93.8
<b>Employment Status</b>		
Working/employed	65	40.4
Unemployed	96	59.6
<b>Basic problem related to the nose</b>		
Nasal breathing problems	105	65.2
Uncomfortable with deformities	56	34.8

**Table 2.** Preoperative and postoperative NOSE, ROE, and VAS comfort score means of the participants in the 6<sup>th</sup> month

	Preoperative Mean ( $\pm$ SD)	Postoperative Mean ( $\pm$ SD)	Test
NOSE	70.12 $\pm$ 27.71	22.98 $\pm$ 21.40	p<0.001
ROE	18.68 $\pm$ 10.06	70.78 $\pm$ 19.10	p<0.001
VAS Comfort level	3.03 $\pm$ 1.57	7.32 $\pm$ 1.69	p<0.001

Wilcoxon Signed-Ranks test, NOSE, Nasal Obstruction Symptom Scale, ROE, Rhinoplasty Quality of Life Scale, and VAS, Visual Analog Scale

**Table 3.** Correlation of the participants' preoperative and postoperative NOSE, ROE, and VAS scores in the 6<sup>th</sup> month

		Precomfort	Postcomfort	PreROE	PostROE	PreNOSE	PostNOSE
<b>Precomfort</b>	r	1	0.281	0.443	0.010	-0.532	-0.275
	p		<b>0.000</b>	<b>0.000</b>	0.896	<b>0.000</b>	<b>0.000</b>
<b>Postcomfort</b>	r		1	0.194	0.887	-0.242	-0.726
	p			<b>0.014</b>	<b>0.000</b>	<b>0.02</b>	<b>0.000</b>
<b>PreROE</b>	r			1	0.097	-0.210	-0.195
	p				0.227	<b>0.007</b>	<b>0.013</b>
<b>PostROE</b>	r				1	-0.074	-0.657
	p					0.351	<b>0.000</b>
<b>PreNOSE</b>	r					1	0.410
	p						<b>0.000</b>
<b>PostNOSE</b>	r						1
	p						

Spearman's correlation test

## DISCUSSION

Septal deviation is a problem that can cause impairment in respiratory function, nasal congestion, and sinus infections by reducing the

oxygen passage (Taylan et al., 2021). In studies conducted on patients with septal deviation, it is stated that patients commonly experience respiratory problems and their NOSE score is high

(Bulut et al., 2017; Cingi et al., 2011; Gerecci et al., 2019; Valsamidis et al., 2019). In a study by Oppermann et al. (2020), it was found that 88% of the patients experienced nasal obstruction symptoms and functional and aesthetic nasal complaints. In this study, 65.2% of the patients had strong breathing due to septal deviation, the preoperative NOSE score was high and patients had severe nasal obstruction. These findings obtained from our study support the literature and show that patients experience significant impairment in respiratory function related to septal deviation.

Septal deviations cause problems such as nose bleeding, snoring, insomnia, fatigue, headache, and decreased productivity besides impaired respiratory function (Ma et al., 2020; Taylan et al., 2021). These problems may negatively affect the life of the patients and result in a decrease in the QoL (Taylan et al., 2021). In studies evaluating the quality of life in septorhinoplasty patients, it has been reported that the preoperative quality of life of the patients is significantly lower (Bulut et al., 2017; Chavan et al., 2017; Oppermann et al., 2022; Wähmann et al., 2018; Zojaji et al., 2018). In our study, it was determined that the QoL of the patients was low according to the preoperative ROE score and that there was a weak and negative statistically significant correlation between the preoperative NOSE and ROE scores. These findings obtained from our study show that the nasal obstruction experienced by the patients due to septal deviation negatively affects the QoL and the importance of planning the required interventions to improve respiratory function.

Comfort, which is one of the basic human needs, is a goal that human beings have sought and wanted to achieve from birth (Büyükkunal et al., 2018). Comfort is also an important component of patient satisfaction and QoL (Arslankılıç and Göl, 2020). Septal deviations are problems that negatively affect patients' comfort levels and QoL (Taylan et al., 2021). In the study by Taylan et al. (2021), it was found that preoperative comfort level is low, NOSE score is high, and NOSE score is an important determinant of comfort level in individuals with septum deviation. In this study, the patient's preoperative comfort level was low, and the comfort level was positively

correlated with the preoperative ROE score and negatively correlated with the preoperative NOSE. These results show that similar to the literature, nasal obstruction is an important factor affecting patient comfort.

In studies comparing patients' preoperative and postoperative nasal obstruction levels, it has been reported that the nasal obstruction severity of the patients decreased significantly after septorhinoplasty (Gerecci et al., 2019; Ishii et al., 2017; Kütük and Arıkan 2019; Spiekermann et al., 2018). In the study of Gerecci et al. (2019), it was determined that the NOSE score of patients who underwent septorhinoplasty was 71.4 before surgery and decreased to 24.2 in the third postoperative month. In the study of Spiekermann et al. (2018), it was determined that the NOSE score, which was 60 preoperatively, decreased to 20 in the 12<sup>th</sup> postoperative month. In the study of Kütük and Arıkan (2019) on patients who underwent rhinoplasty, it was determined that the NOSE score of the patients at the 1<sup>st</sup>, 3<sup>rd</sup>, and 6<sup>th</sup> months after surgery decreased significantly. In our study, it was determined that the NOSE score, which supports the literature, significantly decreased in the 6<sup>th</sup> postoperative month, from 70.12 to 22.98.

Apart from improving respiratory function, septorhinoplasty is an effective treatment method that increases the QoL and comfort level of the patient, positively affects the visual appearance of the individual, and reduces other symptoms such as headache, nose bleeding, and decreased productivity (Taylan et al., 2021; Wähmann et al., 2018). Evaluating the long-term results of septorhinoplasty in the studies, it was found that patients reported a decrease in their symptoms associated with septal deviation and a significant increase in their QoL (Bulut et al., 2017; Chavan et al., 2017; Cingi et al., 2011; Wähmann et al., 2018) and comfort level (Taylan et al., 2021). In the study of Taylan et al., in which they compared the nasal obstruction and comfort level before and after surgery in septorhinoplasty patients, it was determined that the comfort level of the patients increased significantly. Kalakuntla et al. (2019) also found that the QoL of patients increased significantly after septorhinoplasty. Bulut et al. (2017) found that

patient satisfaction increased by 28.7% in the 1st year after rhinoplasty and 35.3% in the 5th year. In the literature review by Wähmann et al. (2018) and Zojaji et al. (2018), evaluated the QoL after rhinoplasty, it was determined that the QoL life after rhinoplasty increased significantly. In our study, it was found that the ROE score, which was  $18.68 \pm 10.06$  before surgery, increased to  $70.78 \pm 19.10$  in the 6<sup>th</sup> month after surgery. This finding obtained from our study shows that similar to the literature, septorhinoplasty provides a significant improvement in the QoL of patients. This result may be related to the improvement of nasal obstruction.

There are some limitations in the study. The limitations of the study are that the study was conducted in a single center, and the monitoring was limited to only the 6<sup>th</sup> month. Second, only one follow-up was made with the patients. The strengths of the study are the large sample size and the evaluation of patients in three different dimensions such as nasal obstruction, quality of life, and comfort with three scales.

## CONCLUSION

This study determined that septal deviation caused a decrease in the patient's respiratory function, QoL, and comfort level, and an improvement in the respiratory function of the patients in the 6<sup>th</sup> month after septorhinoplasty. It was also found that the comfort and QoL of patients increased significantly. Surgical nurses should determine the respiratory function, QoL, and comfort level of the patients before and after the surgery, and interventions that will increase the quality of life and comfort level of patients should be planned. Also, it is recommended to plan multi-center studies involving more patients and repeated measurements.

## Conflict of Interest

There are no potential conflicts of interest.

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