

## Effectiveness of Septoplasty in Relieving Nasal Obstruction in Patients with Deviated Nasal Septum

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### ABSTRACT

**Background:** Nasal obstruction has many causes and can range from mild feeling unwell to a life-threatening condition. Deviated nasal septum is the most common cause of nasal obstruction, which mostly occur due to trauma. Septoplasty is a corrective surgical procedure to straighten the nasal septum.

**Objective:** To evaluate the effectiveness of septoplasty in relieving nasal obstruction in patients presenting with deviated nasal septum.

**Materials and Methods:** This prospective case series study was conducted at Khyber Teaching Hospital Peshawar (a tertiary healthcare center of Pakistan) from January 2019 to June 2019. Data regarding age, gender, duration of symptoms and effectiveness of septoplasty was gathered.

**Results:** The mean age of our patients was 30. 62% patients were male and 38% patients were female. Mean duration was 2 years. Septoplasty was effective in 80% patients and was not effective in 20% patients. No significant relationship was identified with age, gender and duration of symptoms.

**Conclusion:** Our study concludes that septoplasty was effective in 80% patients in relieving nasal obstruction in patients presenting with deviated nasal septum.

**Key Words:** Septoplasty, Nasal obstruction, deviated nasal septum.

This article may be cited as: Ubaidullah, Alam M, Muhammad T, Usman M, Ahmad S, Zakirullah. Effectiveness of Septoplasty in Relieving Nasal Obstruction in Patients with Deviated Nasal Septum. J Saidu Med Coll Swat 2022;12(2):71-74. DOI:https://doi.org/10.52206/jsmc.2022.12.2.663

### INTRODUCTION

Nasal obstruction is the major and important symptom of sinonasal pathology usually due to membranes lining the nasal cavity become swollen from inflamed blood vessels<sup>1</sup>. Nasal obstruction can occur due to variety of different causes and can range from a mild feeling of being unwell to a life-threatening condition. Nasal obstruction has many causes, but the main cause is deviated nasal septum, which mostly occurs due to trauma<sup>2</sup>. Some other causes of nasal obstruction are: enlarged adenoid, hypertrophy of turbinate, sinonasal masses, and polyps in the nasal cavity<sup>3</sup>. Deviated nasal septum might be a congenital problem, which is caused by trauma to the nose during delivery process. DNS is some time caused by disorders of connective tissue e.g various Syndromes of genetic origin like syndrome of Ehlersdanlos, Marfan syndrome & Homocystinuria. The cost of medication to relieve nasal obstruction symptoms is very high. According to a study in the United States (US), about 5 billion dollars are spent every year for the

relief of nasal obstruction<sup>4</sup>. Septoplasty is a procedure in which the nasal septal deviation is corrected (straighten) with minimal removal of nasal septal cartilage. Nasal septum acts as a wall (partition) between the two (right & left) nostrils. This procedure (Septoplasty) was started for the 1<sup>st</sup> time in the 19<sup>th</sup> century, but many modification has been done since then. The procedure had been improved a lot with time. This technique is used by ENT surgeons in patient having nasal obstruction symptoms to improve the function of nose by opening the respiratory passage. Physiology of the nose is not disturb in septoplasty. Septoplasty is a very common operation for nasal obstruction done in US, with the aim "to improve the quality of life"<sup>4</sup>.

Previously many studies were conducted to know the effect of septoplasty on the improvement of nasal obstruction symptom. In 2009, a study was done on two groups' i.e nasal septum deviation group & nasal septum deviation with allergic rhinitis group. It was found that there was much improvement in the nasal air passage for both groups. The overall relief from nasal obstruction symptoms was more in the nasal septum deviation group as compared to the nasal septum deviation with allergic rhinitis group<sup>10</sup>. In a study published in 2013, 60 patients who had some degree of nasal obstruction symptoms underwent septoplasty. All symptoms of nasal obstruction showed significant improvement after surgery<sup>11</sup>. According to another study conducted by

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Received: September 23<sup>th</sup>, 2021 Accepted: April 28<sup>th</sup>, 2022

American Academy of Otolaryngology Head and Neck Surgery Foundation in 2014 on 61 patients, the mean NOSE (Nasal Obstruction Symptom Evaluation) score was decreased significantly from 68.2 before surgery to 17.5 three months postoperatively<sup>12</sup>.

To our knowledge there is no such study been done in our region that has reported the “effectiveness of septoplasty in relieving nasal obstruction”. Studies in the literature reports variable results of septoplasty done with different approaches. The objective of my research study was “to evaluate the effectiveness of septoplasty in relieving nasal obstruction in patients presenting with DNS”.

**MATERIALS AND METHODS**

A prospective cohort research study was carried out in the Department of Otorhinolaryngology and Head & Neck Surgery Khyber Teaching Hospital Peshawar, KPK Pakistan from 1<sup>st</sup> January 2019 to 30<sup>th</sup> June 2019. (For which the Ethical review committee issued a certificate of approval on 01/09/2018 with diary No. 120/KTH/ENT). Total no of patients were 151 (Sample size, which was calculated by using 74% effectiveness of septoplasty in nasal obstruction<sup>5</sup>. 95% confidence level & 7% margin of error with the help of WHO software). Consecutive, non-probability sampling technique was used for data collection. Data including demographics, duration of symptoms was gathered. Septoplasty operation was considered as positive when there was complete relief of nasal obstruction symptoms after three months of the surgery. All surgeries were performed by Associate Professor Dr.Zakirullah, (A qualified FCPS ENT Surgeon having 20 Years practical Experience in the field of ENT).

We analyze & stored our data in the latest version of “Statistical Package for Social Sciences (SPSS)” version 20. Mean and standard deviation (Descriptive statistics) were calculated for quantitative variables like age and duration of symptoms. Frequency and percentages were calculated for categorical variables like Gender & effectiveness. Effectiveness was stratified among age, gender & duration of symptoms to see the effect modification. After stratification the “chi-square test” was applied to the data (keeping p-value =0.05 as significant).

**Operational Definitions:**

1. Deviated Nasal Septum: Patient presenting

with history of unilateral obstruction and on clinical examination (anterior rhinoscopy) showing deviation of the nasal septum towards the effected side<sup>1</sup>.

2. Nasal Obstruction: Any hindrance to the passage of air into and out of the nose. We will determine nasal patency by clinical assessment (Anterior Rhinoscopy)<sup>2</sup>.

3. Effectiveness of Septoplasty: Effectiveness of the procedure will be consider positive if there is complete relive of nasal obstruction Symptoms after three months of time<sup>2</sup>.

**RESULTS**

In this study a total 151 patients were observed to determine the (Effectiveness of septoplasty in relieving nasal obstruction in patients presented with deviated nasal septum). The average (mean) age of our study patients was 30years (SD ±1.26) There were 94 (62%) males as compared to 57 (38%) females. The average (mean) duration of symptom (nasal obstruction) was 2years (SD ± 2.89). Septoplasty was performed in all patients with standard technique. Out of 151 patients, 121 (80.1%) patients reported to have adequate relief from the symptom of nasal obstruction whereas 30 (19.9%) patients didn't report change in their symptom.

We categorized age, gender and duration of symptoms to see the relation of the characteristic features with relief of nasal obstruction. No significant relationship was identified (Table No. 1)

**Table 1. Characteristic Features**

Features	Efficacy		Total	P Value
	Effective	Not Effective		
<b>AGE</b>				
20-30 years	72	13	85	0.2999
31-40 years	35	10	45	
41-50 years	12	6	18	
51-60 years	2	1	3	
<b>Total</b>	<b>121</b>	<b>30</b>	<b>151</b>	
<b>GENDER</b>				
Male	75	19	94	0.8914
Female	46	11	57	
<b>Total</b>	<b>121</b>	<b>30</b>	<b>151</b>	
<b>DURATION OF SYMPTOMS</b>				
= 1 year	34	8	42	0.8754
> 1 year	87	22	109	
<b>Total</b>	<b>121</b>	<b>30</b>	<b>151</b>	

## DISCUSSION

Deviated nasal septum is usually due to repeated trauma of the nose. It may be a congenital problem, or it can be due to nasal compression during delivery of a child. Sometime DNS is associated with congenital disorders of connective tissue origin (e.g Marfan syndrome, Homocystinuria and Ehlersdanlos syndrome). The deviated nasal septum is straighten surgically with a procedure known as Septoplasty. Septoplasty is a conservative & a corrective surgical procedure. The procedure was performed for the 1<sup>st</sup> time in 19<sup>th</sup> century, and since then it has been modified and improved with time. The aim of this procedure is to open the nasal respiratory passage in the nasal obstruction symptom and at the same time preserving the physiologic functions of the nose. "Septoplasty is the third most common surgical procedure done in otolaryngology in the US, with the aim of improving the quality of life"<sup>5</sup>.

The average (mean) age of our study patients was 30years (SD  $\pm$ 1.26) There were 94 (62%) males as compared to 57 (38%) females. The average (mean) duration of symptom (nasal obstruction) was 2years (SD  $\pm$  2.89). Septoplasty was effective in 80% patients and was not effective in 20% patients.

Previously many studies were conducted to know the effect of septoplasty on the improvement of nasal obstruction symptom. According to a study published in 2001, (analysis of the outcomes of septoplasty in 121 patients revealed significant improvement in nasal obstruction in 74% patients)<sup>6</sup>. A study published in American Journal of Rhinology & Allergy, (56 patients completed questionnaires to assess nasal obstruction after septoplasty, 34 (60.7%) patients reported their nasal obstruction was much improved, 17 (30.3%) reported their condition was improved, and 5 (8.9%) reported no change postoperatively)<sup>7</sup>. A study conducted on 68 patients, (94.4% improvement was noted and had relied from nasal obstruction after septoplasty by the 60th postoperative day)<sup>8</sup>. According to another study done on 59 patients, septoplasty was performed to correct deviation of nasal septum, and the study patients were reexamined at 3 months and 6 months duration post operatively. There was much improvement in the nasal obstruction<sup>9</sup>. In 2009, a study was done on two groups i.e nasal septum deviation group & nasal septum deviation with allergic rhinitis group. It was found that there

was much improvement in the nasal air passage for both groups. The overall relief from nasal obstruction symptoms was more in the nasal septum deviation group as compared to the nasal septum deviation with allergic rhinitis group<sup>10</sup>. In a study published in 2013, 60 patients who had some degree of nasal obstruction symptoms underwent septoplasty. All symptoms of nasal obstruction showed significant improvement after surgery<sup>11</sup>. According to another study conducted by (American Academy of Otolaryngology Head and Neck Surgery Foundation in 2014 on 61 patients, The mean NOSE score was decreased significantly from 68.2 before surgery to 17.5 three months postoperatively)<sup>12</sup>. A study done in Swedish journal in 2018, nasal obstruction symptoms relived in 76% of the patients undergone septoplasty after six months after surgery<sup>13</sup>. A study done on 888 patients, 63% of the patients reported an improvement (mild to moderate) in nasal obstruction symptoms after 12 months of septoplasty<sup>14</sup>. A study done in 2018 shows that there is much improvement in Nasal obstruction symptoms after septoplasty, but no additional improvement after septoplasty & turbinoplasty combined<sup>15</sup>. Valsamidis et al. performed a study which comprised 60 patients with nasal obstruction, using NOSE and SNOT 22 questionnaires<sup>16</sup>. There was improvement in NOSE & SNOT scores. A study done on 56 patients in American Journal of Rhinology & Allergy, there is 75% of the patients improved in their nasal obstruction<sup>17</sup>. According to a study published in *European Archives of Oto-Rhino-Laryngology*, there was significant decrease in post-op NOSE score ( $p < 0.001$ )<sup>18</sup>. A study done on 20 patients in Egypt, the total NOSE scores shows significant improvement after septoplasty, with mean  $\pm$  SD=2.45 $\pm$ 1.70, when compared with preoperative scores, with mean  $\pm$ SD=18.95 $\pm$ 0.76 ( $P < 0.001$ )<sup>19</sup>. A study done on 70 patients conclude that septoplasty either done by Conventional or Endoscopic methods cause improvement in nasal obstruction symptoms<sup>20</sup>. A study done in Poland in 2021 on 51 patient. The NOSE score was done at 3 & 7 Months post operatively. The NOSE score was reduce from 60.3+-20.4 to 32.9+-16.8 at the end of 3 months post operatively & to 39.6+-33.2. So there was a significant improvement in Nasal obstruction symptoms<sup>21</sup>. Bugten et al.<sup>20</sup>revealed that nasal obstruction cause symptoms like snoring, oral breathing, and nasal discharge, which weaken the general health of the patient. Septoplasty leads to a highly significant symptom improvement<sup>22</sup>.

**CONCLUSION**

Our study concludes that septoplasty was effective in 80% patients in relieving symptoms of nasal obstruction in those patients who were presented with Nasal septal deviation. It is a conservative & corrective procedure which should be considered for patients having symptoms of nasal obstruction due to nasal septal deviation.

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**DATA SHARING STATEMENT:** The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**CONFLICT OF INTEREST:** Authors declared no conflict of interest.

**GRANTED SUPPORT AND FINANCIAL DISCLOSURE:** Nil

**AUTHOR'S CONTRIBUTION**

The following authors full fill authorship criteria as per ICMJE guidelines;

**Ubaidullah, Alam M:** Idea conception, drafting the work, final approval, agreed to be accountable for all the work.

**Muhammad T, Usman M:** Design of the work, data acquisition, critical revision, final approval, agreed to be accountable for all the work.

**Ahmad S:** Data analysis, drafting of the work, final approval, agreed to be accountable for all the work.

**Zakirullah:** Data interpretation, critical revision, final approval, agreed to be accountable for all the work.