

Effect of Septoplasty on Headache among Patients with Septal Deviation in Karbala, Iraq 2023

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ABSTRACT

Introduction: Headache is a common complaint of many patients, & had many types with intermingled & overlapped diagnoses. Septoplasty also is a common operation that some thought had a strong relationship to headache relief.

Objective: To evaluate the effectiveness & relation of Septoplasty on people complaining of frequent (Headaches).

Study Design: A prospective study carried out in Al-Imam Alhassan AL Mujtaba Teaching Hospital / Department of Surgery, from (February 2022 to February 2023).

Patients & Methods: Our study includes (90) patients, (60 females with an age range of 19->40 years) & (30 males with an age range of 18 - > 30 years). Detailed history taking & physical examinations were done. Of course, all those patients were examined by an anterior Rhinoscopy & Nasal Endoscope). We found (Septal Spur in contact with Inferior Turbinate) in (70 patients) 30 males / 40 females. Also found 25 patients with (Middle Turbinate - Contact Points - with Septal spur /or deviation), 15 male / 10 female. Also in our study, (44 patients) were diagnosed to have (Concha Bullosa), 18 males / 26 females. This study didn't include any patients diagnosed with (Rhinosinusitis).

Results: After surgery (Septoplasty) compound when needed with Inferior Turbinoplasty, Spure Removal, Concha Bullosa Opening & Trimming, we found that the prevalence of headaches before and after septoplasty and the results were: Before surgery, tension headaches were present in 46.72% of the patients and after surgery only 20% of the patients did not get any relief ($P < 0.0001$). Other headache types also showed improvement: the number of migraines reduced from 34.41% to 15.55% ($P < 0.0001$), the number of cluster headaches decreased from 6.66% to 2.22%, and the number of cervical Osteoarthritis(OA) headaches reduced from 12.21% to 6.6 This makes it clear how effectively septoplasty can relieve tension headaches and also improve other headache types, as indicated by the low P-values.

Conclusion: No Guarantee of 100 % in relieving Headaches after (Septoplasty, Inferior Turbinoplasty, Concha Bullosa opening, or trimming).

Keywords: Concha bullosa, Septoplasty, ENT, Headache, septal deviation.

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INTRODUCTION

Nasal septal deviation is the highest prevalent factor observed in otolaryngology Ear, Nose, and Throat (ENT) clinics worldwide. It is recognized as a worldwide health concern¹, nasal septal deviation has been the one major condition experts have encountered most in outpatients departments in ENT clinical. It is recognized that 90% percent of the population has this disorder by researchers². Nasal problems affecting the septum as well as deviation may be among the known triggers and causal factors also of headaches³.

Headaches are among the primary and the most crippling health difficulties experienced by millions around the world⁴. The condition of the nasal passages being closed, or a deviated septum, may lead to sinus problems or nasal congestion, and headache. Therefore, the procedure of septoplasty may be offered for treatment of these underlying nose issues and in the end may be able to prevent the headaches⁵.

Septoplasty, one of the surgical procedures, known for its effectiveness in managing nasal obstruction and consequently improving overall nasal airflow by correcting the deviated septum, has long been a part of the treatment plan. This procedure is primarily known for its ability to improve the patient's breathing, however, people are also becoming increasingly interested in it for its broader impact on a person's overall health and quality of life. One of interest is the potential impact of septoplasty on headaches⁶.

Septoplasty has also different effects on headaches such as tension headaches, migraines, and cluster headaches. The exploration of these types of headaches is still an ongoing field. Factors like patient demographics, underlying medical conditions, and surgical methods do have a bearing on the outcomes of septoplasty in case of headaches⁷.

Septal deviation, which can worsen their symptoms, is another common complaint among patients who visit otolaryngology clinics to report their headaches. These headaches are the result of the contacts that are formed with the mucosal wall of the opposing side and which cause recurrent sinusitis attacks and intensified rhinogenic or secondary headaches primarily via the fifth cranial nerve⁸. The patients could draw the false conclusion that headaches are only caused by these conditions, which could hide the presence of other causes, septoplasty, and the mainstay of septal deviation treatment, has demonstrated some symptom-improving results⁹. Nevertheless, the results of the surgery in patients with septal deviation are still controversial, which mandates an evaluation of long-term data. Additionally, the differentiation between sinusoidal headaches due to septal deviation from chronic headaches such as a combination of migraines and other headaches has not been given enough attention. To relieve the symptom of headache, the most annoying one, clinicians choose either septal deviation correction or allergic reaction or both, but without clarifying the nature of this symptom.

This uncertainty has resulted in patients who have had surgery but continue with their headaches. Observations reveal that the septal deviation of the patients having it is more prone to migraines, which are, usually, undiagnosed and untreated^{10, 11}.

To cover these gaps in knowledge, the objectives of the current study were as follows:

- (i) For the identification and the frequency of headaches and their types (sinusoidal, migraine or combinations) in patients with septal deviations.
- (ii) To evaluate the impact of septoplasty on headaches and their types in patients with septal deviations.

These goals were designed to discover the sophisticated connection between nasal septal deviation and headaches so that doctors can apply a more precise and more cost-effective diagnostic framework during patient visits and the treatment methods for these conditions.

MATERIALS & METHODS

Study Design: This is a prospective study among 90 patients (60 females with age range from 19->40 years) & (30 males with age range from 18->30 years) who visited the outpatient clinical of Otolaryngology of Imam Al-Hassan Al-Mujtaba Teaching Hospital / Department of Surgery, from February 2022 to February 2023).

Ethical clearance: was taken from the ethical clearance committee of the Karbala Health Department. Patients who gave consent for the study were included in the study, and those who did not give consent were excluded.

Selection of patients: The ninety patients included in the study were who had septal deviation with headache without Rhinosinusitis were included; any other patient with (Rhinosinusitis) was excluded.

Data collection: The detailed history taking & physical examination were done by using a special Questionnaire form containing demographic details and type of diagnosis with headache scales pre-septoplasty and follow-up for several months post-septoplasty to detect the level of headache (Not relieved, Decreased frequency & severity, Relief temporarily (3 months), & Relieve completely) depending on the type of headaches (Tension Headache, Migraine Headache, Cluster Headache, & Cervical OA Headache).

Of course, all those patients were examined by an anterior Rhinoscopy, Nasal Endoscope, & Computed Tomography (CT) scan. We found (Septal Spur in contact with Inferior Turbinate) in 70 patients, 30 male / 40 female. As shown in (**Figure 1**).

Also found (were 25 patients) with (Middle Turbinate - Contact Point - with Septal spur /or deviation) 15 male / 10 female. As shown in (**Figure 2**).

Also in the current study, (44 patients) were diagnosed to have (Concha Bullosa) 18 males / 26 females. Our study didn't include any patients diagnosed with (Rhinosinusitis). As shown in (**Figure 3**).

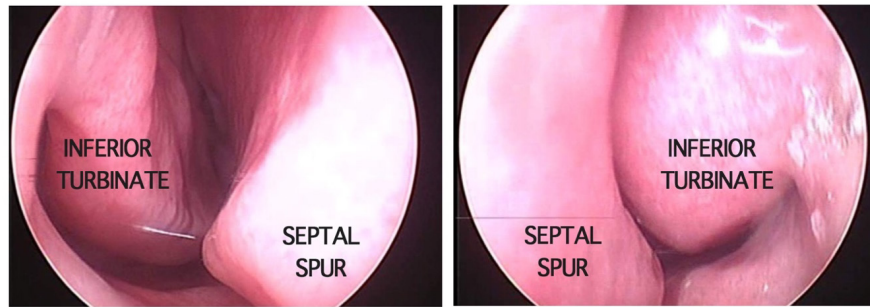


Figure 1: Anterior rhinoscopy and nasal endoscopy in the diagnosis of septal spur in contact with inferior turbinate.

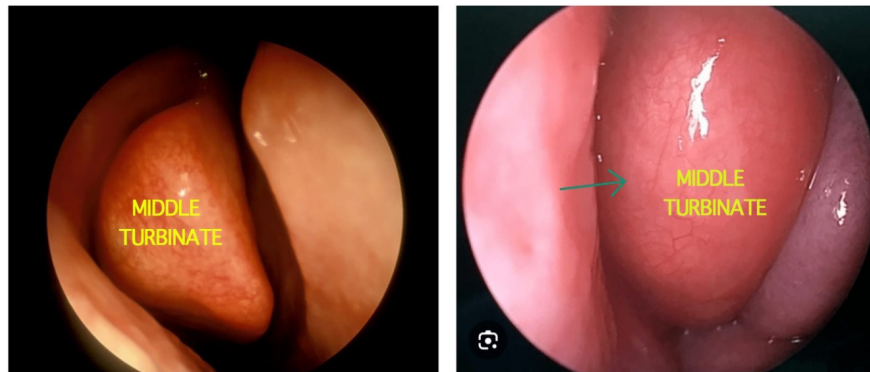


Figure 2: Anterior rhinoscopy and nasal endoscopy in the diagnosis of septal spur with middle turbinate.

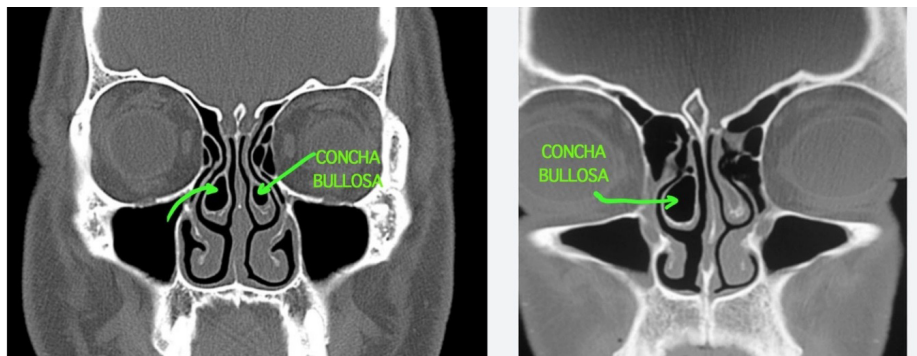


Figure 3: Nasal CT scan of the patient had a concha bullosa.

Statistical analysis: Statistical analysis of data was performed using SAS (Statistical Analysis System - version 9.1). The chi-square test was used to assess the significant differences among proportions. $P < 0.05$ is considered statistically significant.

RESULTS

Regarding age and sex distribution of patients, the figures present some interesting patterns. Whereas there is a high likelihood of septoplasty among women of all ages, the peak coincides with the age groups of 19-25 years and 26-40 years. With regards to males, this probability is evenly distributed among the 18-30 years and >30 years groups. This could be evidence of the differences in nasal pathologies occurrence between sexes and age groups, further necessitating the exploratory research (**Table 1**).

While no statistically significant difference between “the proportions of patients with a septal spur in contact with the inferior turbinate” was observed, it was slightly more

prevalent among females. Likely, a septal spur is one of the anatomical peculiarities that might be found in many patients resected for septoplasty (**Table 2**).

Again, the prevalence of the middle turbinate contact point with septal spur/deviation is not significantly different between male and female. This trend **Table 3** reveals that even middle turbinate is likely a common anatomical feature in patients undergoing septoplasty regardless of gender (**Table 3**).

Concha bullosa, which is a common anatomical variant of the nasal cavity, was more prevalent among females than among males, but the difference was not statistically significant. Therefore, concha bullosa may be associated with nasal obstruction and may be an indication for septoplasty in many patients of either gender (**Table 4**).

The distribution of different headache types and their occurrences before and after septoplasty in patients who underwent Surgery is shown in **table 5**. Tension headaches

Table 1: Age & Sex distribution.

sex	Age group				Total
Female	19-25 years	26-40 years	> 40 years		60 (66.67%)
	30 (33.3%)	20 (22.2%)	10 (11.1%)		
Male	18-30 years		> 30 years		30 (33.33%)
	15 (16.67%)		15 (16.67%)		
Total					90 (100%)

Table 2: Septal Spur in contact with inferior turbinate.

Sex	No. (%) of patients	P-value
Male	30 (42.8%)	0.23NS
Female	40 (57.2%)	
Total	70 (100%)	

Table 3: Middle turbinate contact point with septal spur/deviation.

Sex	No. (%) of patients	P-value
Male	15 (60%)	0.31NS
Female	10 (40%)	
Total	25 (100%)	

Table 4: Concha bullosa patients.

Sex	No. (%) of patients	P-value
Male	18 (40.9%)	0.22NS
Female	26 (59.1%)	
Total	44 (100%)	

Table 5: Types of Headache Diagnosed Pre and Post-operatives.

Types of Headaches	Preoperative		Postoperative			P-value
	No. (%) of patients	Not relieved	Decrease frequency & severity	Relieve temporarily (3 months)	Relieve completely	
Tension Headache	42	18 (20.0%)	10	6	8	<0.0001
	-46.72%		-11.11%	-6.66%	-8.88%	
Migraineurs Headache	31	14	5	7	4	
	-34.41%	-15.55%	-5.55%	-7.77%	-4.44%	
Cluster Headache	6	2 (2.22%)	1	1	2	
	-6.66%		-1.11%	-1.11%	-2.22%	
Cervical OA Headache	11	6 (6.66%)	4	1	1	
	-12.21%		-4.44%	-1.11%	-1.11%	
Total	90	40 (44.44%)	20	15	15	
	-100%		-22.20%	-16.67%	-16.67%	

were the most rampant preoperatively and were relieved after surgical intervention to reduce the frequencies and severity level with a significant P-value of <0.0001. It is evident evidence from this was that septoplasty is fundamental in the relief of Tension headaches (**Table 5**).

DISCUSSION

Understanding the patients' demographic and anatomical features which are behind nasal obstruction and related surgical intervention is, in turn, a key that opens the doors to the described factors.

Age & sex distribution: The distribution of septoplasty among the population based on both age and gender could

be linked to the existing studies suggesting differences in the nasal anatomy and pathology between the population determined by their demographic factors^{9,12}. The more common septoplasty procedures performed on females, especially in the 19-25 year and 26-40 years brackets may be impacted by hormonal fluctuations, anatomical differences, or a greater awareness of nasal problems among females in these age groups. On the contrary, the high prevalence of cases for the ages of males across the whole age spectrum implies that nevertheless, some predisposing factors impact the cause of nasal obstruction nowadays.

Septal spur in contact with inferior turbinate: The septal spur in contact with the inferior turbinate is equally

present in both genders thus implying that these anatomical abnormalities tend to coexist with nasal obstruction regardless of the gender^{13,14}. This, though no statistical significance, nevertheless gives an affirmation that septal deviations and turbinate abnormalities are very common among septoplasty patients.

Middle turbinate contact point with septal spur/deviation: While the incidence of middle turbinate basic contact to septal spur or deviation in male and female is not significantly different, the occurrence of anatomical factor in patients who undergo septoplasty is rather popular. This result again supports the previous studies any crookedness in the middle turbinate are associated with septal deviations¹⁵.

Concha bullosa patients: The higher frequency of (concha bullosa) females compared to males, although not significant, highlights the probable role of this nose anatomical variant in the cause of nasal obstruction¹⁶. Concha bullosa, which refers to pneumatization (foxfication) of the middle turbinate¹⁷, may result in airflow impedance thereby resulting in the symptoms which call for septoplasty.

The relationship between the septoplasty and various forms of headaches.

Tension headache: Tension headaches are the most common form of primary headache disorders. In most of these headaches, the pain is bilateral, aching or pressing in its nature. The remarkable decrement in the occurrence of the tension headaches after septoplasty concurs with the findings of the studies that stressed the contribution of the nasal obstruction in increasing the frequency of tension headaches¹⁸. To instance, a study by Singh et al. shows that patients with chronic tension-type headache had higher nasal resistance that those with healthy nose and operation of nasal obstruction resolves the headache significantly¹⁹.

Migrainous headache: Migraines are complex neurological conditions marked by sudden recurrent shooting head pain frequently accompanied also by nausea, vomiting, and problems with light and sound perception. Although the results of the septoplasty procedure in the group of migraineurs reported in the current study were varying, another study found promising results. As an illustration, the work by Moufti and his colleagues has shown a massive drop in the frequency and intensity of migraines in people who had a deviation in the nasal septum and migraine to²⁰. Thus, this connection might throw light on the structure of the migraine pathology and uncover some more details calling for the additional study.

Cluster headache: Cluster headaches, which are painful primary headaches with one-sided pain and autonomic symptoms, occur in a few clusters with attacks lasting between 15 minutes to three hours²¹. Cluster headache abatement following the process post septoplasty supports the research paper from earlier findings showing a possible relationship between nasal pathologies and cluster headache severity. As an illustration, Lalhmingmawii et al.

published a study on the evidence of more nasal septal deviation in patients with cluster headaches that is highly significant²². Further, the surgical fixation of nasal septal deviations leads to a reduction in the number of cluster headache attacks in some patients clearly emphasizing the significant role septal correction plays in the management and prophylaxis of headaches.

Cervical OA headache: Cervical Osteoarthritis headaches, which stem from musculoskeletal abnormalities in the cervical spinal column, may show up as a primary headache and may put a strain on the diagnosis too. Despite in our study the answer to septoplasty in patients with cervical OA headaches was blurred, we should pay attention to referred pain and central sensitization mechanisms as factors that possibly affect the condition. One study done by Fernandez-de-las-Penas et al. reported that women with Cervical OA matching symptoms also have nasal pathology²³. Therefore patients with nasal obstruction after undergoing septoplasty surgery will be free from headache because there is no pain coming from the trigeminocervical nucleus of the spinal cord.

CONCLUSION

The current research testifies to how essential an imperative when undertaking septoplasty that is associated with inferior turbinoplasty and concha bullosa procedures is to be able to know their limits in the treatment of headaches. However, although these surgeries can be a first step to addressing many cases that lack other solutions, our conclusion shows us that there is no guarantee for 100% resolution of all headaches. Thus, it becomes evident the complexity of the connection between the nasal deviation and the headaches.

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Conflicts of Interest: The authors declare that there is no conflict of interest.

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