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Septoplasty with turbinectomy versus septoplasty with postoperative topical steroids for management of severe nasal septal deviation with turbinate hypertrophy

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Abstract
Background: In the field of otorhinolaryngology, nasal blockage is a common patient complaint. Overgrowth of the inferior turbinate on the side of a deviated nasal septum is a common symptom. The compensatory hypertrophy of the inferior turbinate may regresse on its own side after septoplasty. Topical steroids are frequently preferred in inferior turbinate hypertrophies, use of local corticosteroid in cases of hypertrophied inferior turbinate may enable us to avoid the complications of surgery, postoperative recovery period and the cost of surgery.
The Aim: This study was to evaluate the efficacy of the septoplasty with inferior turbinectomy versus septoplasty with postoperative topical steroids for cases of severe nasal obstruction n due to severe nasal septal deviation and inferior turbinate hypertrophy.
Patients and Methods: This research was carried out on 100 patients at the department of otorhinolaryngologist and head and neck surgery, faculty of medicine, university of Tanta as a cohort study on patients undergoing septoplasty alone followed by postoperative use of topical steroids versus septoplasty with inferior turbinectomy.
Results: One of the most common surgical treatments performed nowadays is septoplasty. The present study evaluated the efficacy of the septoplasty when comparing septoplasty vs inferior turbinectomy with postoperative topical steroids for examples of extreme nasal obstruction caused by hypertrophy of the inferior turbinates and deviated nasal septum.
Conclusions: Patients with a deviated nasal septum and hypertrophied inferior turbinates often find relief from their nasal symptoms after undergoing a septoplasty and partial turbinectomy.

Keywords: HIT, DNS, local corticosteroid, septoplasty

Introduction
In the field of otorhinolaryngology, nasal blockage is a common patient complaint. One of the most prevalent reasons for nasal blockage is a deviated septum [1]. Other conditions that cause nasal obstruction include nasal polyps, nasal tumors, enlarged adenoids, and enlarged turbinates [1].
Overgrowth of the inferior turbinate on the side of the nose with a deviated septum is common. Septoplasty has the potential to cause the compensatory hypertrophy of the inferior turbinates to diminish over time [1]. However, some writers have stated that the alterations caused by turbinate hypertrophy are not reversible and must be rectified during nasal septal surgery since they include the bone as well as the mucosa of the inferior turbinates [2].
Hypertrophied inferior turbinates due to allergic and vasomotor rhinitis have been effectively treated with intranasal steroids rather than destruction or resection for over twenty years [3].
Topical steroids are frequently preferred in inferior turbinate hypertrophies, use of local corticosteroid in cases of hypertrophied inferior turbinate may enable us to avoid the complications of surgery, postoperative recovery period and the cost of surgery [4].
The therapeutic effects of corticosteroids on asthma and nasal problem have been studied extensively in recent years, but our understanding of the underlying processes is still limited.

Several glowing testimonials [5] their mechanisms of action in the treatment of asthma and allergy illnesses have been published [5].

Patients and Methods

The study protocol has been approved from local Research Ethical Committee, Quality Assurance Unit, Faculty of Medicine code (33754/3/20)

One hundred patients from the division of otorhinolaryngologist and head and neck surgery participated in this study, faculty of medicine, university of Tanta as a cohort study on patients undergoing septoplasty alone followed by postoperative use of topical steroids versus septoplasty with inferior turbinectomy.

This study included patients with deviated nasal septum with hypertrophy of inferior turbinate and aged between 18 and 65 years.

Acute or chronic rhinosinusitis, perforated nasal septum and insufficient nasal valve, granulomatous condition of the nose and sinus, craniofacial malformation, pregnancy, adenoid hypertrophy, patients unfit or refusing surgery, and patients younger than 18 were all disqualified.

Methods

In this study, one-hundred patients were included in the study. They were divided into two groups, group A that includes 50 patients underwent septoplasty followed by postoperative topical steroids for 3 months and group B that includes 50 patients underwent septoplasty with inferior turbinectomy.

After taking an informed written consent, all patients were evaluated by their general preoperative routine examination, full ENT examination and anterior rhinoscopic examination.

Results

Table (1) summarizes comparison between the two studied groups according to sex. Group A had 38 males and 12 females, while Group B had 31 males and 19 females. There was statistically non-significant difference between gender distributions in the two groups.

Group A: Undergo septoplasty followed by postoperative topical steroids for 3 months

This table shows that there were 38 (76.0%) were males and 12 (24.0%) were females in group A (Undergo septoplasty followed by postoperative topical steroids for 3 months).

There were 31 (62.0%) were males and 19 (38.0%) were females in group B (Undergo septoplasty with inferior turbinectomy).

Table (2): Comparison between pre-operative and post-operative nasal obstruction according to NOSE Scale in group A. mean Pre-operative NOSE Scale was 15.50±2.83 and post-operative was 8.88±3.40. there was a statistically significant decrease in NOSE Scale Post-operatively (p<0.001*).

This table shows that the mean Pre-operative NOSE Scale was 15.50±2.83 SD with range (10.0 – 20.0) and post-operative was 8.88±3.40 SD with range (0.0 – 16.0).

There was highly statistically significant difference between NOSE Scale as regard pre-operative and post-operative in group A (Undergo septoplasty followed by postoperative topical steroids for 3 months).

Table (3): Comparison between pre-operative and post-operative nasal obstruction according to NOSE Scale in group B. mean Pre-operative NOSE Scale was 15.30±2.51 and post-operative was 2.56±1.88. There was a statistically significant decrease in NOSE Scale Post-operatively (p<0.001*).

This table shows that the mean Pre-operative NOSE Scale was 15.30±2.51 SD with range (10.0 – 20.0) and post-operative was 2.56±1.88 SD with range (0.0 – 6.0).

There was highly statistically significant difference between NOSE Scale as regard pre-operative and post-operative in group B (Undergo septoplasty with inferior turbinectomy).

Table (4): Comparison between the two studied groups according to difference. Mean NOSE Scale difference in group A was 6.62±3.45 and group B was 12.74±2.74. There was a statistically significant difference in NOSE Scale Difference between groups (p<0.001*). Group B was higher in NOSE Scale difference than group A.

This table shows that the mean Pre-operative NOSE Scale was 15.30±2.51 SD with range (10.0 – 20.0) and post-operative was 2.56±1.88 SD with range (0.0 – 6.0).

There was highly statistically significant difference between NOSE Scale as regard pre-operative and post-operative in group B (Undergo septoplasty with inferior turbinectomy).

Table (5): This table shows that the mean pre-operative evaluation of symptoms by VAS in group A was 6.38±1.32 SD with range (4.0 – 8.0) and post-operative was 7.90±1.39 SD with range (4.0 – 9.0).

There was highly statistically significant difference between evaluation of symptoms by VAS as regard pre-operative and post-operative in group A.

Discussion

Nasal obstruction is a common reason for a visit to an ENT doctor, and a deviated nasal septum is a common culprit. Nasal polyps, nasal infections, nasal tumors, and enlarged adenoids are further causes [6]. The procedure of repairing a deviated nasal septum (Septoplasty) was developed in the 19th century and has undergone several refinements ever since. Efforts to enhance nasal flow have prioritized maintaining the nose's other physiological activities (Such as filtering, warming, and moistening the air) as much as possible [7]. Among otorhinolaryngology procedures, septoplasty is the third most prevalent in the United States [8].

Septoplasty is a common surgical surgery performed all over the world. Several research have demonstrated the efficacy of this method; nevertheless, the vast majority of these investigations have relied on retrospective data [9]. These surveys were either telephone interviews or examinations of existing databases [6]. Non-nasal obstruction specific quality of life questionnaires have been used in several retrospective investigations [9]. For patients with severe nasal obstruction caused by severe nasal septal deviation and inferior turbinate hypertrophy, we compared the results of septoplasty with inferior turbinectomy to those of septoplasty with postoperative topical steroids.

The participant characteristics such as age and gender distribution did not affect the outcome of our study, as these characteristics were equally distributed between the groups and showed no statistically significant findings.

In our study we utilized NOSEscale for assessment of nasal obstruction. Stewart *et al*. [10] The Nose Obstruction Symptom Evaluation (NOSE) scale was created and validated to assess quality of life in patients with nasal obstruction. There are five questions total. The patient gives each item a score from 0 to 4. A final score ranging from 0

to 100 is obtained by multiplying the total of the elements by 5. This score represents the clinical burden of nasal blockage.

Positive outcomes for individuals undergoing septoplasty with partial inferior turbinectomy were shown to be statistically significant in our research. NOSE scores indicated improvement in symptoms compared to those who had only had septoplasty.

In our study Patients who underwent septoplasty with postoperative corticosteroids nasal spray have higher NOSE score for nasal congestion preoperatively was 15.50±2.83 and post-operative was 8.88±3.40 compared to those undergoing partial inferior Turbinectomy with septoplasty who's NOSE scores preoperatively was 15.30±2.51 and post-operative was 2.56±1.88. Mean NOSE Scale difference in group A was 6.62±3.45 and group B was 12.74±2.74.

In agreement with our results, Resende *et al*., [11] individuals who had sedation and local anesthetic for a septoplasty with bilateral out fracture of the inferior turbinates showed clinical improvement compared to those who did not. There was a high association between the preoperative score and the postoperative improvement within this time period, and patients who completed the NOSE questionnaire before and after surgery showed statistically significant improvement. Quality of life is greatly enhanced after a septoplasty with bilateral out fracture of the inferior turbinates for a variety of diseases.

Dinesh *et al*., [12] assessed the improvement of nasal symptoms in both surgical groups prior to and after surgery using the NOSE scale, and compared the results in groups A and B who had septoplasty with partial inferior turbinectomy. Significant postoperative improvement was seen in both Group A patients who underwent septoplasty with partial inferior turbinectomy and Group B patients who underwent septoplasty alone. When evaluating subjective outcomes using the NOSE scale, individuals who underwent partial inferior turbinectomy surgery in conjunction with septoplasty fared much better than the control group. Chronic nasal obstruction due to a deviated nasal septum and hypertrophy of the contralateral turbinate was found in this study and should be treated by addressing the hypertrophy of the turbinates.

Our findings are consistent with those of the vast majority of studies, which advocate for a combination of septoplasty and partial inferior turbinectomy. According to the findings of Jun *et al*. [14] in patients with unilateral nasal septal deviation and compensatory hypertrophy of the contralateral inferior turbinate, it was determined that septoplasty and concomitant inferior turbinate surgery to manipulate conchal bone and soft tissues were necessary for treatment.

In the present study, mean VAS score difference in group A was 2.20±1.84 and group B was 6.54±1.46. There was a statistically significant difference in VAS score Difference between groups ($p<0.001^{*}$). Group B was higher in VAS score difference than group A. The study by Stewart *et al*.(6) similar research has used the NOSE score for subjective evaluation of nasal obstruction and has come to the same conclusion that nasal septoplasty improves disease-specific quality of life, patient satisfaction, and medication use in patients with septal deformity.

Gilead Berger *et al*. [15] showed in his study that the thickness of the bone of the turbinate increase in patients with severe septal deviation, so partial turbinate reduction was preferred with septoplasty.

Leandro Castro Velasco *et al*. [16] discovered that patients' symptoms improved after undergoing septoplasty with or without turbinectomy. Initial assessments showed a considerable reduction in sneeze and nasal pruritus symptoms by day 7, with these symptoms remaining stable until day 60 after surgery.

When comparing the NOSE scores before and after septoplasty with turbinectomy, a substantial increase was found in the follow-up period of 2 months. These findings suggest that the postoperative effect on quality of life may be discovered for up to 2 months after surgery, however the significant advantage of septoplasty without fracture of inferior turbinates may be identified as early as 30 days following surgery.

Our research shows that the combination of septoplasty and turbinectomy is the most effective method for correcting a deviated nasal septum that is causing symptoms. Patients who have septoplasty in conjunction with turbinectomy report a statistically and clinically substantial improvement in their nasal obstruction problems. Despite the fact that both operations are helpful in alleviating the patient's symptoms, turbinectomy is the only one that leaves both nostrils with plenty of space. When compared to our study, the other studies find similar improvements in symptoms following repair of a deviated nasal septum [17].

Local anatomy and nasal physiology are important factors to think about, but the surgical approach you choose is also important. Our research shows that combining septoplasty with turbinectomy improves the success rate of treating deviated nasal septum symptoms. Patients who have septoplasty with turbinectomy report a statistically and clinically significant improvement in nasal obstruction, nasal congestion, sleep disturbances, and nasal airflow.

In conclusion, the findings of this study demonstrated the need of treating hypertrophied inferior turbinates in chronic instances of nasal obstruction due to a deviated septum. In addition to septoplasty, a partial inferior turbinectomy should be performed on these patients. Patients with a deviated nasal septum and hypertrophy of the inferior turbinates often find relief from their nasal symptoms after undergoing a septoplasty and partial turbinectomy. In addition to conventional diagnostic tools, the NOSE score can be utilized as a subjective measure of nasal symptoms in patients before and after surgery.

Table 1: Comparison between the two studied groups according to sex.

Sex	Group A (n = 50)		Group B (n = 50)		χ^2	p
	No.	%	No.	%		
Male	38	76.0	31	62.0	2.291	0.130
Female	12	24.0	19	38.0		

χ2: Chi square test

p: p value for comparing between the studied groups

Table 2: Comparison between pre-operative and post-operative nasal obstruction according to NOSE Scale in group A

Nose Scale	Pre-operative	Post-operative	t	p
Min. – Max.	10.0 – 20.0	0.0 – 16.0	13.585*	<0.001*
Mean±SD.	15.50±2.83	8.88±3.40		
Median (IQR)	16.0(14.0 – 18.0)	9.50(7.0 – 10.0)		

IQR: Inter quartile range SD: Standard deviation t: Paired t-test

p: p value for comparing between pre-operative and post-operative

*: Statistically significant at $p \leq 0.05$

Table 3: Comparison between pre-operative and post-operative according to NOSE Scale in group B

NOSE Scale	Pre-operative	Post-operative	t	p
Min. – Max.	10.0 – 20.0	0.0 – 6.0	32.889*	<0.001*
Mean±SD.	15.30±2.51	2.56±1.88		
Median (IQR)	15.0(13.0 – 17.0)	2.0(1.0 – 4.0)		

IQR: Inter quartile range SD: Standard deviation t: Paired t-test
p: p value for comparing between pre-operative and post-operative
*: Statistically significant at $p \leq 0.05$

Table 4: Comparison between the two studied groups according to difference

Difference	Group A (n = 50)	Group B (n = 50)	T	P
Min. – Max.	2.0 – 18.0	7.0 – 19.0	9.831*	<0.001*
Mean±SD.	6.62±3.45	12.74±2.74		
Median (IQR)	5.50 (4.0 – 8.0)	12.50 (11.0 – 15.0)		

IQR: Inter quartile range SD: Standard deviation t: Student t-test
p: p value for comparing between the studied groups
*: Statistically significant at $p \leq 0.05$

Table 5: Comparison between pre-operative and post-operative according to evaluation of symptoms by VAS score in group A

Evaluation of symptoms by VAS score	Pre-operative	Post-operative	T	P
Min. – Max.	4.0 – 8.0	4.0 – 9.0	8.452*	<0.001*
Mean±SD.	6.38±1.32	7.90±1.39		
Median (IQR)	6.0 (6.0-8.0)	8.0 (7.0-9.0)		

IQR: Inter quartile range SD: Standard deviation t: Paired t-test p: p value for comparing between pre-operative and post-operative
*: Statistically significant at $p \leq 0.05$

Conclusions

Patients with a deviated nasal septum and hypertrophy of the inferior turbinates often find relief from their nasal symptoms after undergoing a septoplasty and partial turbinectomy.

Abbreviations

SMR: submucous resection of the septum, SD: Standerd Deviation, CT: Computed tomography, VAS: Visual analogue scale, Fig: Figure, ICA: Internal carotid artery, IT: Inferior turbinate, MRI: Magnetic resonanace imaging, NO: Number, CM: Centimeter, ECA: External carotid artery.

Author's Contribution

Not available

Conflict of Interest

Not available

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