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Satisfaction of patients who underwent a Septorhinoplasty with or without Allergic Rhinitis: A cross-sectional study at a tertiary hospital

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ABSTRACT

Background: Patients with a nasal obstruction frequently present at the clinic. The obstruction is managed by a septoplasty accompanied by an operation, a septorhinoplasty, to correct the nasal deformity. *Objectives:* The objective of the study was to compare allergic and non-allergic patients in terms of symptomatic improvement and patient satisfaction after a septorhinoplasty. *Methods:* A cross-sectional study was conducted at King Abdulaziz Medical City (KAMC) with patients who had a septorhinoplasty between June 2015 and June 2018. The data was collected using a globally accepted scale, namely the NOSE questionnaire. *Results:* The sample realized as 222 and 73.40% (n=163) were male, the mean age was 30.4 years. Nasal obstruction was the main complaint, which was reported by 78.80% (n=175) of the combined sample. Overall, for the non-allergic subgroup, the proportions of the categories of the NOSE score (normal, mild, moderate, severe and extreme) before and after surgery were: normal (11.90% vs 30.50%), mild (21.5% vs 40.7%), moderate (24.60% vs 21.20%), severe (29.70% vs 6.80%) and extreme (12.70% vs 6.80%). For the allergic subgroup, before and after septorhinoplasty the proportions for the categories were: normal (4.80% vs 20.20%), mild (10.6% vs 36.50%), moderate (23.10% vs 26.90%), severe (29.7% vs 6.8%) and extreme (12.7% vs 6.70%). *Conclusion:* In patients with a septal nasal deformity (SND), with allergic or non-allergic rhinitis, septorhinoplasty results in significant symptomatic improvement.

Keywords: septorhinoplasty; allergic rhinitis; satisfaction

1. INTRODUCTION

Nasal obstruction occurs frequently and has multiple etiologies. The main causes are a deviated nasal septum (DNS) and allergic rhinitis (AR). DNS is a condition in which the nasal septum, composed of bone and cartilaginous parts which give the nose its shape and divide the nasal cavity into half, is significantly off-center or crooked causing difficulty in breathing and airflow obstruction at the side which is markedly deviated (WebMD, 2019). DNS is usually accompanied by turbinate hypertrophy contralateral to the deviation (van Egmond et al., 2018). Statically, approximately 80% of the human population has some kind of DNS (Harvard Health, 2019) which can result from traumatic or congenital causes. A local Saudi Arabian study suggested that most of the patients with a DNS are asymptomatic and a traumatic cause is the most significant etiological factor for patients seeking medical care (DAGHISTANI, 2002). DNS is mainly diagnosed based on symptoms and clinical findings by using nasal endoscopy and computed tomography (CT) and can be reconstructed with septoplasty. Septoplasty is a procedure performed to straighten and repair the nasal septum. The main indication for septoplasty is nasal obstruction, commonly described as an unpleasant sensation of insufficient airflow through the nose (van Egmond et al., 2018). Septoplasty can be performed with an operation to correct the nasal deformity, known as septorhinoplasty.

AR is an IgE-mediated inflammation of the nasal mucosa initiated by an allergic response to inhaled allergens (Sheikh and Jean, 2018). AR results from seasonal and/or perennial aeroallergens. Patients commonly present with rhinorrhea, nasal congestion, sneezing, and itching of the nose and eyes (Sheikh and Jean, 2018). The diagnosis of AR is made clinically, based on the presenting symptoms, and a good response to empirical treatment with an antihistamine or nasal glucocorticoid (Wheatley and Togias, 2015). However, a formal diagnosis is based on evidence of the presence of allergen specific IgE in the serum or by positive epicutaneous skin tests (Wheatley and Togias, 2015). Managing AR is involving allergen avoidance if possible and medical therapy such as antihistamine and intranasal steroid (Wheatley and Togias, 2015). A prospective study suggested that patients with AR tend to be less satisfied compared to patients without allergy after septorhinoplasty (Karatzanis et al., 2009). In contrast, a second study indicated that both allergic and non-allergic rhinitis patients had similar outcomes (Sokoya, Gonzalez and Winkler, 2018). The studies focused on controlling the AR.

Studies assessing the effect of AR on patients' symptoms, appearance, and satisfaction following septorhinoplasty operations are limited locally and globally. We conducted this study with the objective to compare allergic and non-allergic patients in terms of symptomatic improvement and patient satisfaction after the septorhinoplasty.

2. METHODS

A cross-sectional study was conducted at King Abdulaziz Medical City (KAMC), a tertiary hospital of the Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia between May-June 2019. All patients who had a septorhinoplasty during June 2015 and June 2018 were invited to participate in the study. The inclusion criteria were adult patients aged ≥18 years who had a septorhinoplasty at least 6 months prior to study participation at KAMC and followed-up at KAMC. The exclusion criteria were patients who underwent

septoplasty with sinus surgery, having a nasal mass, congenital obstruction, and pregnancy. The data was collected using the globally accepted Nasal Obstruction and Septoplasty Effectiveness Scale (NOSE) questionnaire (Stewart et al., 2004). The demographic data included age, gender, height, weight, BMI, diagnosed with allergic or non-allergic rhinitis, and symptoms of allergic rhinitis. The NOSE questionnaire was used in multiple published studies to assess the quality of life and the severity of nasal symptoms. The questionnaire consists of 5 questions that are scored with a 5-point Likert scale ranging from 0 through 100. This questionnaire was completed for the pre-and post-surgery period. A higher score indicates worse symptoms. A pilot study was done with 10 participants to determine if there were any issues with the interpretation of the questionnaire. All participants answered the questions easily and within a few minutes. The questionnaire was completed via a telephone interview. Verbal consent was obtained from the participants. The patients' responses were evaluated and compared with their clinical assessments pre- and post-surgery by reviewing the medical records available in the hospital's electronic medical record system.

The study (Protocol number #RC19/060/R) was approved by the Institutional Review Board at King Abdullah International Medical Research Center, Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia.

3. RESULTS

The sample size realized as 222 participants. The majority, 73.40% (n=163) was male and the mean age was 30.4 (±10.44) years, with the mean BMI 26.48 (±6.23). The sample was divided in two subgroups, based on the AR diagnosis. The AR subgroup constituted almost half of the sample 46.8% (n=104), 79,80% (n=87) were using prescribed medication, and the condition was controlled in a small proportion 29.90% (n=32). Nasal obstruction was the main complaint, which was reported by 78.80% (n=175) of the combined sample (Table 1).

Table 1 Demographic information

		N	**%**
Gender	Male	163	73.40%
	Female	59	26.60%
Diagnosed with allergic rhinitis	No	118	53.20%
	Yes	104	46.80%
If yes, Did you use your medications?	No	22	20.20%
	Yes	87	79.80%
If yes, Are you stable?	No	75	70.10%
	Yes	32	29.90%
Nasal obstruction	No	47	21.20%
	Yes	175	78.80%
Sneezing	No	126	56.80%
	Yes	96	43.20%
Itching	No	137	61.70%
	Yes	85	38.30%
Nasal congestion	No	112	50.50%
	Yes	110	49.50%
Watery nasal discharge	No	127	57.20%
	Yes	95	42.80%
	Age		
Mean	30.4		
Median	28		
Std. Deviation	10,446		
Minimum	15		
Maximum	69		

The NOSE Scale classifies the patient's symptoms in five sub-groups (no problem "normal", mild, moderate, severe and extreme). The proportions per symptom category pre- and post-surgery for non-allergic patients were: normal (11.90% vs 30.50%), mild (21.5% vs 40.7%), moderate (24.60% vs 21.20%), severe (29.70% vs 6.80%) and extreme (12.70% vs 6.80%). It should be noted that for the non-allergic patients, there was a visible NOSE score improvement, as the majority of the mild cases became normal, moderate cases became mostly mild or normal, and for severe and extreme cases, the largest proportion became mild (Table 2).

Table 2 Comparing NOSE score before and after septorhinoplasty between patients with allergic rhinitis and non-allergic

		Diagnosed with allergic rhinitis					
		No		Yes		P-Value	
		Count	Column N %	Count	Column N %		
Nose Score Before Classified	Scored 0 (not a problem)	14	11.90%	5	4.80%	0.012	< .001*
	Mild	25	21.20%	11	10.60%		
	Moderate	29	24.60%	24	23.10%		
	Severe	35	29.70%	37	35.60%		
	Extreme	15	12.70%	27	26.00%		
Nose Score After Classified	Scored 0 (not a problem)	36	30.50%	21	20.20%	0.057	
	Mild	48	40.70%	38	36.50%		
	Moderate	25	21.20%	28	26.90%		
	Severe	8	6.80%	10	9.60%		
	Extreme	1	0.80%	7	6.70%		

For the AR subgroup, the pre- and post-surgery proportions of the various categories were: normal (4.80% vs 20.20%), mild (10.6% vs 36.50%), moderate (23.10% vs 26.90%), severe (29.7% vs 6.8%) and extreme (12.7% vs 6.70%). For allergic patients, the symptoms also improved after surgery, almost all with a mild score became normal, the majority who were moderate became mild or normal, the majority of severe cases became mild, and the majority of extreme cases became moderate. However, by comparing pre- and post-septorhinoplasty based on the diagnosis of allergic rhinitis, the difference was statistically significant in both allergic and non-allergic rhinitis patients, with P-value of <0.001 in both cases (Chart 1 & 2).

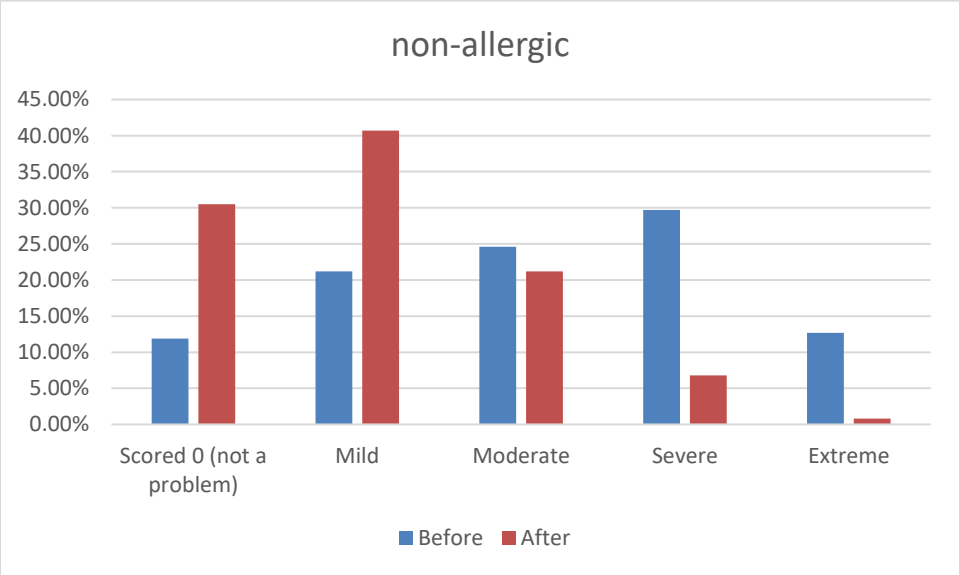

Chart 1 Comparing the outcome of non-allergic patient before and after septorhinoplasty

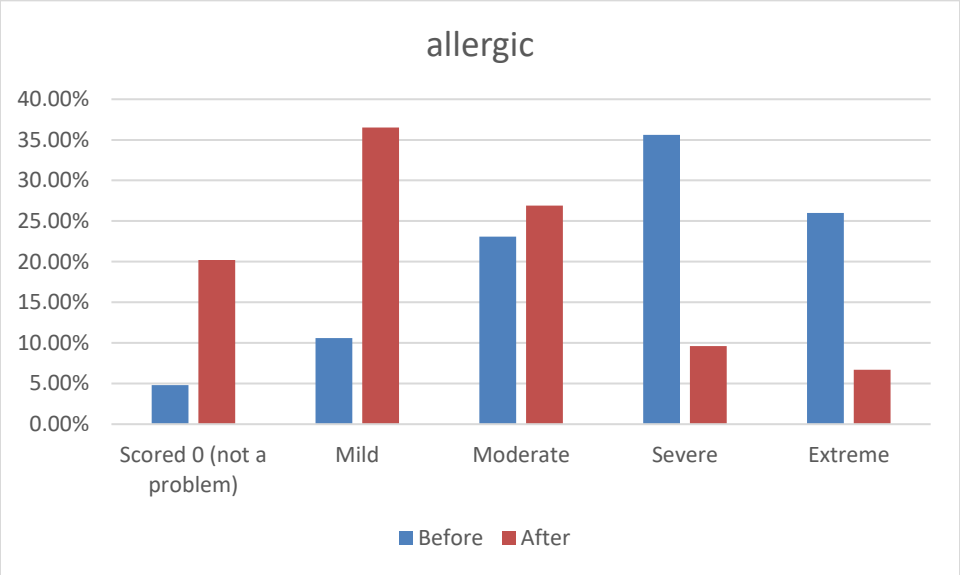

Chart 2 Comparing the outcome of patient with allergic rhinitis before and after septorhinoplasty

4. DISCUSSION

The current study highlights the favorable outcomes after septorhinoplasty in patients with allergic and non-allergic rhinitis. Multiple studies investigated the patient outcome after septorhinoplasty and the findings are congruent with the current study [Stewart et al., 1996; Samad et al., 1992; Hwang et al., 1999; Floyd et al., 2017]. Evidence has also been provided of good functional outcomes for open septorhinoplasty as measured by the NOSE score (Floyd et al., 2017). The methodology of three of the previous studies [Stewart et al., 1996; Samad et al., 1992; Hwang et al., 1999] was chart retrieving physician rated outcomes and patient-based outcomes are limited, supporting the methodological decision related to data gathering in the current study. Samad et al. also used a telephone survey to determine patient satisfaction post-septoplasty.

In a similar study (Sokoya, Gonzalez and Winkler, 2018) using the NOSE Scale, evaluated whether a diagnosis of AR affects the surgical outcomes of open septorhinoplasty (OSR) and to examine whether OSR provides the same degree of improvement in the quality of life to patients with and without AR pre- and post-operatively. The sample was divided in two groups based on a diagnosis of AR (non-allergic rhinitis vs allergic rhinitis) and compared the quality of life (QoL) improvement in terms of the NOSE Scale categories. They reported that patients with and without AR, experienced similar OSR outcomes as measured by the NOSE Score, supporting the current study's results. The improvement in the NOSE Score reported in the current study is consistent with single and multi-center cohort studies evaluating QoL after rhinoplasty (Rhee et al., 2005; Lindsay, 2012; Most, 2006).

In contrast, Karatzanis et al. reported that patients with AR had worse outcomes after the septoplasty and were less likely to be satisfied (Karatzanis, 2009). Septorhinoplasty has the potential to reach additional areas of obstruction, including the columella, caudal septum, and nasal valves. The ability to use several grafts to surgically correct the deformities allows the surgeon to provide structural support to areas contributing to nasal airway obstruction. The correction of multiple surgical targets during septorhinoplasty is superior in terms of nasal breathing improvement compared to septoplasty. This may explain our finding that patients with AR and non-AR experience an improvement in the NOSE Scores due to a generally improved nasal passageway. However, post-surgery, uncontrolled AR patients were expected to have a level of baseline nasal obstruction and they need medical evaluations. The evidence produced in the current study should support performing septorhinoplasty safely when indicated, in patients with AR.

The current study has a few limitations. It was performed with patients through a telephone interview without a physical assessment by a surgeon. All the participants had a septorhinoplasty in the same institution. The study could be made more robust and externally valid by including patients from multiple institutions. However, the uniformity of the institutional setting improves the internal validity and prevents variability in the surgical results. The strengths of the current study are the use of a validated instrument and patient-based outcome assessment.

5. CONCLUSION

In patients with SND, with allergic or non-allergic rhinitis, nasal septorhinoplasty results in significant symptomatic improvement. Patients with a higher degree of symptomatic nasal obstruction had larger improvements after surgery. However, patients with uncontrolled AR will likely continue to have a level of baseline nasal obstruction, requiring medical intervention.

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Conflicts of Interest: The authors declare no conflict of interest.

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