

A Novel Approach for Long Nose Rhinoplasty and its One-year Follow-up Results

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Abstract

Background: Long nose caused by a long nasal septum and a plunging tip is known as one of the unpleasant conditions leading to facial disharmony.

Methods: In this study, structure rhinoplasty was performed on the patients based on the three-dimensional (3D) view of their noses. The dynamics of the long nose were thus shortened, using a novel approach, particularly through normalizing the frontonasal angle along with reconstructing the nasal dorsum, which required cutting the dorsum, and then suturing its overlap.

Results: In total, 10 patients were recruited, whose radix-subnasal (RS) and radix-pronasale (RP) were compared before and after the surgery. The study results revealed a significant difference between the pre- and post-operative RP (35 ± 6.78 , 32.1 ± 6.78 , respectively) (p -value = 0.011), but such a difference was not significant regarding the RS.

Conclusion: Upon the consideration of the 3D view of the nose, structure rhinoplasty can be introduced as an appropriate approach to make a well-shaped functional nose in Middle-Eastern patients suffering from long noses.

Keywords: Nose; Rhinoplasty; Nasal Septum; Nose Deformities, Acquired; Middle East

Abbreviations

OSR : Oxidative Stress Relief; RS: Radix-subnasale; RP: Radix-pronasale

Introduction

Facial beauty means the symmetry, harmony, and geometry of various parts of the face, so the ideals of facial proportions in humans occur when the perfect facial profile is divided into equal thirds. Long nose has been always an aesthetic complaint,

but physiological complications, such as difficulty breathing, have made it an emotional stressor, particularly in young patients. Besides, patients' self-perception is disturbed, and a long nose itself can exacerbate the so-called psychological background [1]. Among the causes of face imbalance is when the nose looks long in comparison to the rest of the facial features, turning patients to do rhinoplasty to find their desired appearance. However, there is some controversy about the effect of the gender in the candidates for rhinoplasty [1]. On the other hand, studies suggest that, rhinoplasty

cannot affect patients' self-esteem and long-term satisfaction in spite of their sense of pleasure after it [2].

The most common complaints with long nose may thus arise from a long nasal septum or a plunging tip. Here, plunging is defined as the inferior rotation of the nasal tip, which can yield to a long appearance [3,4]. Rhinoplasty is accordingly a known procedure for both aesthetic and medical purposes. In this sense, improved breathing and natural looking but better self-image is among the surgery goals [5]. One of the important objectives of long nose rhinoplasty is to create a suitable harmony to the facial features via making them much more proportionate. In view of that, long nose surgery includes excisional and structural rhinoplasty. In this respect, foreshortened nose and post-operative loss of nasal tip projection are achieved following excisional rhinoplasty, resulting in the long nose correction by the excessive excision of the caudal margin of the nasal septum. On the other hand, structural rhinoplasty is based on tip cartilage repositioning and reshaping instead of cutting and removing a huge amount of nasal cartilage, which can moderate the high risks of alar retraction, pinching, and prominent nostrils, viz. excessive alar cartilage excision, as the most common nasal deformities. Following Roe and Joseph, introducing the resection of the retro-orbicularis oculus fat (ROOF), osteotomy, and tip procedure standards, various surgeries have been so far proposed and open structure rhinoplasty (OSR) is considered as the commonly used one. Dorsum preservation and open approach via transcolumellar incisions are also among other alternatives [1,6]. In this study, a novel approach for long nose surgery through structural rhinoplasty was presented, and then its short-term effects on nose length parameters were measured.

Materials and Methods

Subjects

In total, 10 patients referring to a private Ear, Nose, and Throat (ENT) clinic for rhinoplasty due to a long nose, from January 2018 to June 2018, were included in this study. All the patients, without congenital abnormalities, were thus asked for the process and the first five men and five women, who accepted to enter into this pilot study, undergone the surgery. Of note, the patients presenting with nasal septum deviations and turbinate hypertrophy were excluded.

Ethical approval

The Local Ethics Committee affiliated to Iran University of Medical Sciences, Tehran, Iran, approved the study protocol. The

research procedure was then described to the patients and informed written consent was obtained before their inclusion and the surgery via the novel approach. Of note, the study protocol was consistent with the main ethical principles of the Declaration of Helsinki 1975, provided in a prior approval by the institution's Human Research Committee.

Surgical procedure

The novel approach consisted of open rhinoplasty under general anesthesia. For this purpose, the dorsum septum was cut, and then overlapped after the bilateral mucoperichondrial flap elevation. The cartilage was subsequently closed using a polydioxanone (PDS) suture. The given procedure is illustrated in figure 1.

Figure 1: The schematic view of the novel approach for long nose rhinoplasty. A. After elevating the bilateral mucoperichondrial flaps on the septum, the senior surgeon resected the central septal segment (if needed) to focus on the central septal deflections or reduce the loss of dorsal or tip support preservation at least 1 cm in dorsal and caudal septal segments, termed (viz. the L-struts) if grafting materials were needed for rhinoplasty, B. The full thickness cut of the dorsal segment of the nasal septum, C. The overlap of the part based on the senior surgeon's estimation.

All the patients recruited in this study were operated through OSR under general anesthesia. As anesthesia was induced, 1% xylocaine with 1:200,000 epinephrine was thus infused into the dorsal subcutaneous plane, the nose sidewalls, the lobule, and the nasal septum. The excess dorsal cartilaginous septum was afterward removed using cartilage scissors. Simultaneously, the excess bony hump was excised with a sharp chisel. Next, the bony dorsum was smoothed by a fine curved rasp. The ensuing step was the lateral-dorsal osteotomy, conducted through a 2-mm osteotome based on a low-to-high approach.

The cartilage grafts were further harvested from the cartilaginous septum, utilizing the standard technique, with the aim to preserve 10-15 mm of dorsal and caudal strut. The transcolumellar incision was then closed with 6-0 non-absorbable sutures, and the infracartilaginous ones were stitched with 5-0 absorbable sutures.

Measurements

Before and one year after the surgery, nose length was evaluated using the technique described by Ali, *et al.* [3]. In sum, radix-pronasale (RP), denoting the distance from the radix to the protruding nasal tip and radix-subnasale (RS), representing the distance from the radix to the columella midpoint, were measured based on the half-face photos of the patients with their heads in its resting position.

Statistical analysis

The study data were analyzed using the SPSS Statistics (ver. 25.0) software package. The pre-and post-operative quantitative data were also evaluated via Wilcoxon signed-rank test. Moreover, the continuous variables, having a normal distribution, were shown as mean ± standard deviation (SD), and the categorical ones were described as proportions or ratios. In addition, the baseline characteristics of the study subjects and the post-operative measures in both genders were compared, with reference to Mann-Whitney U test or Fisher’s exact test. Ultimately, p-value<0.05 was considered as statistically significant.

Results

In total, 10 patients, including five men and five women, were recruited in this study. The mean age of the patients was 31.4 (±5.54) and the mean values for the pre-operative RS and RP were equal to 35.00 (±6.78) and 37.30 (±6.78), respectively. These scores, then converted into 32.1 (±9.02) and 33.2 (±9.29), after the surgery, and a significant difference was observed for the RP (p-value = 0.011) but not for the RS (p-value = 0.074). The comparison between the RP and the RS are visualized in figure 2 and table 1. The histogram for such changes is further displayed in Figure 2 and the representative patients are shown in figure 3.

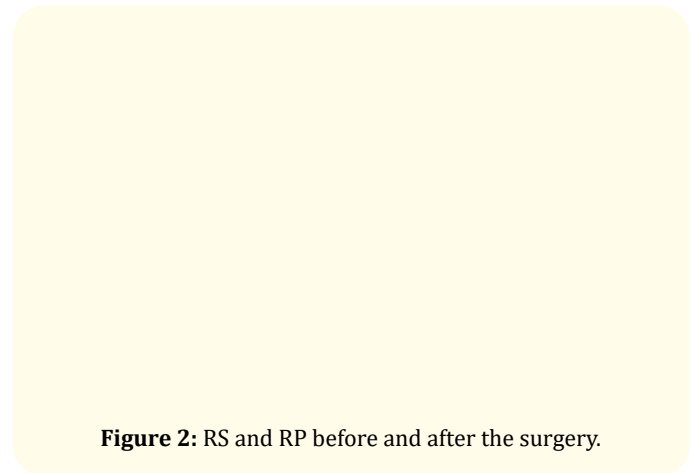


Figure 2: RS and RP before and after the surgery.

	Overall	Male	Female	p-value*
Number	10	5	5	1.00
Age	31.4 (±5.54)	32.00 (±4.47)	30.8 (±6.94)	0.754
Pre RS	35.00 (±6.78)	39.20 (±2.78)	30.80 (±7.19)	0.041 *
Post RS	32.1 (±9.02)	34.80 (±3.11)	29.40 (±12.5)	0.375
Pre-Post RS	2.9 (±4.53)	4.40 (±2.19)	1.40 (±5.98)	0.323
Pre RP	37.3 (±6.78)	41.40 (±2.61)	33.20 (±7.40)	0.048 *
Post RP	33.2 (±9.29)	36.60 (±2.07)	29.80 (±12.7)	0.271
Pre-Post RP	4.1 (±4.07)	4.80 (±.84)	3.40 (±5.94)	0.616

Table 1: The comparison of the baseline and post-operative measures by gender.

*: The comparison of males and females.

Figure 3: A. The pre-operative lateral view of a 28-year-old female patient, having a long nose with a plunging tip and profound dorsal hump. B. The one-year post-operative lateral view.

Moreover, there was no age difference in men and women (p-value = 0.754). However, the pre-operative RS and RP were longer in men (p-value = 0.041 and 0.048, respectively). The pre- and post-operative results, divided by gender, are demonstrated in table 1.

Discussion

Long nose is a common complaint for cosmetic rhinoplasty, which can be also a psychological stressor and affect patients' self-esteem. This study presented a novel rhinoplasty approach for patients with long nose complaints, as summarized in Figure 1. As the values suggest, this approach could significantly decrease the RP (about 11%, p-value = 0.011), but that was not the case for the RS (8-11%, p-value = 0.074).

Given that there are two factors related to long nose appearance, including the cartilaginous nasal septum and plunging tip, surgeries to shave and trim down the excess cartilage have been thus far performed in previous studies [7,8]. In this line, Guyuron, *et al.* had found that the differences in the dynamics of the nose, such as shallow radix, dorsal hump, as well as nasal tip drooping were often involved in a long nose structure. Thus, correcting such deformities via maintaining dorsal height and radix could be an effective treatment for normalizing the nose in patients suffering from long noses [9]. In addition, Sheen, *et al.* had further determined that making a good balance between the nose parameters could be more successful than performing reduction surgery in the long nose treatment. Therefore, tip projection could decline the height of the dorsum

in long noses with a dependent and plunging nasal tip, leading to preserved skeletal support [10]. A group of studies had also demonstrated that Middle Eastern natives, like the patients recruited in this research, had a special nasal pattern, e.g., thick and sebaceous skin, characterized by additional fibrous and fatty tissues, high and even wide dorsums together with cartilaginous and bony humps, poorly-defined and plunging tips, weak lateral crura corresponding to the skin envelope, and acute columellar-labial and nasolabial angles [11]. In line with the novel approach proposed in the present study, Daniel, *et al.* had indicated that maintaining the nose structure via columellar struts and tip suture techniques during rhinoplasty for Middle Eastern noses could be much more effective than reduction surgery through destructive tip techniques [12]. Excisional rhinoplasty could further alter the contour of the nostrils and nasal tip shape by removing nasal cartilage and skeletal tissue, but the results might lead to stereotypical nasal deformity and even significant airway obstruction in the presence of long nasal bones. Thanks to preserving skeletal support, structural rhinoplasty could thus avoid the complications of overaggressive cartilage excision and narrow an already attenuated airway [13]. Instead of cutting, removing, and discarding a huge amount of nasal cartilage, and even prompting a progressively uncontrolled failure of the damaged nasal framework, structural rhinoplasty exploits tip cartilage repositioning and reshaping to reach a much more attractive nasal contour. Besides, this type of rhinoplasty can significantly diminish the high risks of the most common nasal deformities, such as alar retraction, pinching, and prominent nostrils due to excessive alar cartilage excision [14,15]. Recently, Ali, *et al.* in their study of Middle Eastern population with a long nose, had reported that structure rhinoplasty could manipulate alar cartilage, nasal osteo-cartilaginous framework, skin, and even soft tissues in the three-dimensional (3D) anatomy of the nose to achieve a beautiful nose with facial balance [3].

This study had some limitations. First, the RS seems to increase significantly in men, but it was not tested statistically, due to the small sample size in this pilot study. Considering the long-term improvement of the nose length through this novel method, it is of utmost importance to investigate patient satisfaction, objective improvements, and side effects in large-scale studies.

Conclusion

This pilot study revealed that the novel approach could improve the long nose complaints, one year after the surgery. To have a fa-

cial balance and a normal nose in patients suffering from a long nose caused by the elongation of the long-axis osteocartilaginous structures, structure rhinoplasty is accordingly essential since it takes account of the 3D view of the nose. Large-scale research is thus needed to reflect on the effects of this novel approach on patients' satisfaction, quality of life, and objective measures.

Conflict of Interest

The authors declared no conflict of interest.

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