Evaluation of the Functional and Aesthetic Outcomes of Alar Base Reduction in Patients of Primary Open Septorhinoplasty

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ABSTRACT:

BACKGROUND:

Open septorhinoplasty is one of the most challenging procedures in facial plastic surgery and consideration must be given to both facial aesthetics and nasal function.

OBJECTIVE:

To evaluate the functional and the aesthetic outcomes of alar base reduction techniques in patients of primary open septorhinoplasty.

PATIENTS AND METHOD:

A prospective, descriptive study had been conducted from the first of April 2018 to the first of April 2019 at the Center of Otolaryngology- Head and Neck surgery at Ghazy AL-Hariry Medical City Hospital, 40 patients were selected (28 females and 12 males) who underwent primary open septorhinoplasty. All patients were evaluated by questionnaire, subjective assessment, clinical examination and photo documentation both pre and post-operatively quantitatively analyzed using image J processing software for objective assessment, with follow up at first, third and sixth month post-operatively and three types of operations techniques were used to reduce the wide nasal base.

RESULTS:

Among the 40 patients, the mean ratio of inter-alar distance to inter-canthal distance changed significantly from (1.234) to (1.034), the frequency of nostrils symmetry increased from (18) patients to (33) patients, the frequency of nasal flaring decreased from 30 patients to only 7 patients, the mean width of the internal vestibular resection was 3.675 mm and the mean width of the external alar wedge resection was 4.45mm. All the patients were satisfied in varying degrees and no worsening of the functional outcomes postoperatively assessed subjectively. No cases of postoperative bleeding, infection, vestibular stenosis, keloid, hypertrophic scar formation or nasal obstruction were encountered.

CONCLUSION:

A conservative excision is preferred to a radical one because it is a simple matter to resect additional alar tissue than reconstruct a stenotic ala. Alar base reduction techniques are effective techniques for patient with wide alar base and/or alar flaring with good outcomes regarding patients' satisfaction and without worsening of the functional outcomes. The internal vestibular floor resection that is inclined 30-45 degrees laterally together with placement of the external alar resection in the natural alar facial crease result in natural curvature of the alar rim and an inconspicuous scar.

KEYWORDS: Alar base reduction, Alar flaring, Septorhinoplasty.

INTRODUCTION:

Alar base reduction is a procedure of balance between multiple structures of the lower nasal vault [1]. The alar base plays an important role in the overall appearance and balance of the nose. The alar base, however, is not often evaluated independently during nasal examinations at the time of surgery. As a result, it is one of the most frequently encountered imperfections during secondary rhinoplasty.[2]

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Nasal Anatomy: The external skin and soft tissue envelope, Osseocartilaginous framework and Internal mucosal lining.[3] The anatomy of the nose and nasal cavity influences nasal airflow. Structures including the external nasal valve, internal nasal valve, nasal septum, and turbinates and nasal mucosa are common sites of abnormalities contributing to nasal airway obstruction [3].

Pre-operative assessment for septorhinoplasty: Psychological assessment .Objective assessment and Subjective Assessment.

Subjective Assessment: A.Rhinoplasty outcome evaluation scale (ROE). [4]

Rhinoplasty Outcomes Evaluation (ROE)

This questionnaire is designed to assist your surgeon in determining the best patient outcomes following rhinoplasty surgery. Your comments are confidential and may be used to refine surgical procedures for future patients. Please circle the number that best characterizes your current opinion regarding the following questions:

1. How well do you like the appearance of your nose?
Not at all 0 Somewhat 1 Moderately 2 Very much 3 Completely 4

2. How well are you able to breathe through your nose?
Not at all 0 Somewhat 1 Moderately 2 Very much 3 Completely 4

3. How much do you feel your friends and loved ones like your nose?
Not at all 0 Somewhat 1 Moderately 2 Very much 3 Completely 4

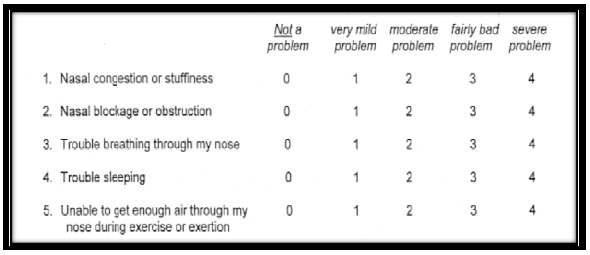
4. Do you think your current nasal appearance limits your social or professional activities?
Always 0 Usually 1 Sometimes 2 Rarely 3 Never 4

5. How confident are you that your nasal appearance is the best that it can be?
Not at all 0 Somewhat 1 Moderately 2 Very much 3 Completely 4

6. Would you like to surgically alter the appearance or function of your nose?
Definitely 0 Most likely 1 Possibly 2 Probably not 3 No 4

Patient s satisfaction scale	
(0-20)	Not at all satisfied
(21-40)	Some what satisfied
(41-60)	Moderately satisfied
(61-80)	Very much satisfied
(81-100)	Completely satisfied

B. Nasal obstruction symptoms evaluation scale (**NOSE**).[5] **:**



	Not a problem	very mild problem	moderate problem	fairly bad problem	severe problem
1. Nasal congestion or stuffiness	0	1	2	3	4
2. Nasal blockage or obstruction	0	1	2	3	4
3. Trouble breathing through my nose	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

Nasal patency scale	
(0-20)	Not a problem
(21-40)	Very mild problem
(41-60)	Moderate problem
(61-80)	Fairly bad problem
(81-100)	Severe problem

Techniques of alar base reduction: Cinching sutures techniques, alar base excisions techniques and flap advancement techniques [6]

AIM OF THE STUDY:

To evaluate the functional and the aesthetic outcomes of alar base reduction techniques in patients of primary open septorhinoplasty.

PATIENTS AND METHODS:

Design & Setting of the study: A prospective, descriptive study was conducted on 40 patients (28 females, 12 males) who underwent primary open approach septorhinoplasty. This study was conducted at Center of Otolaryngology- Head and Neck surgery at Ghazi Al-Hariri Hospital for Surgical Specialties in Baghdad, Iraq. We selected convenience sample, for a period of one year from 1st. April 2018 to 1st. April 2019. Data were collected in first 6th months and followed in next 6th months, all patients were consented regarding the operation and study, ethical committee approval.

Selection criteria:

Inclusion Criteria:

patients 18 years and above, patients with wide alar base and/or alar flaring, with alar flaring only and patients with nasal obstruction due to septal deviation (bony or cartilaginous septal deviation or both).

Exclusion criteria:

patients below 18 years, patients who are psychologically unstable by opinion of psychiatrist and over expectant, revision rhinoplasty which can affect the results, congintal facial anomalies like cleft lip, patients with symptoms and signs of chronic rhinosinusitis and patients with nasal obstruction due to polyps.

Sampling and preoperative assessment:

***Psychiatric assessment* by a psychiatrist.**

Questionnaire: including: Name, phone number, age, date of admission, gender, residence, occupation, date, chief compliant and duration, preoperative assessment, aesthetic desire only, functional desire only, aesthetic and functional desire, history of previous trauma, past medical history, past surgical history including previous nasal surgery, drug history and social history.

The clinical examination:

including inspection of the face and external nose, palpation of nose, patency tests and nasal cavity examination by anterior rhinoscopy any rigid rhinoscopy.

Types of wide alar base:

1. Wide alar base only (defined as an interalar distance that exceeds the intercanthal distance);
2. Normal base with flaring (defined as a marked extension of the lateralaspect of the ala that extended beyond the alar-facial groove), and;
3. Combined (a wide alar base with flaring).

Objective assessment: analysis of the facial landmarks **(**trichion**,** glabella**,** nasion, rhinion, supratip, tip, infratip lobule, soft tissue triangle, subnasale, labrale superioris, stomion, pogonion**,** menton, nasal sill), nasal and facial angles (nasofrontal, nasofacial and nasolabial angle), facial and nasal proportions (facial height and facial width) and fasal base analysis, using the image J processing software.

Subjective assessment of the patient using:

1-The rhinoplasty outcome evaluation scale (ROE).

2-The nasal obstructive symptoms evaluation scale (NOSE).

***Photo analysis*:** After taking right/left lateral and oblique, frontal and basal views. Comparing the ratios of the interalar to the intercanthal distance before and 6 months after surgery on the basis of the basal view the nostril symmetry preoperatively and postoperatively and the presence or the absence of alar flaring.

Investigations: Routine preoperative investigations were done including hematologicail, biochemical, bleeding profile, Chest X ray, ECG and viral screening; CT scan was done to exclude patients with rhinosinusitis from the study.

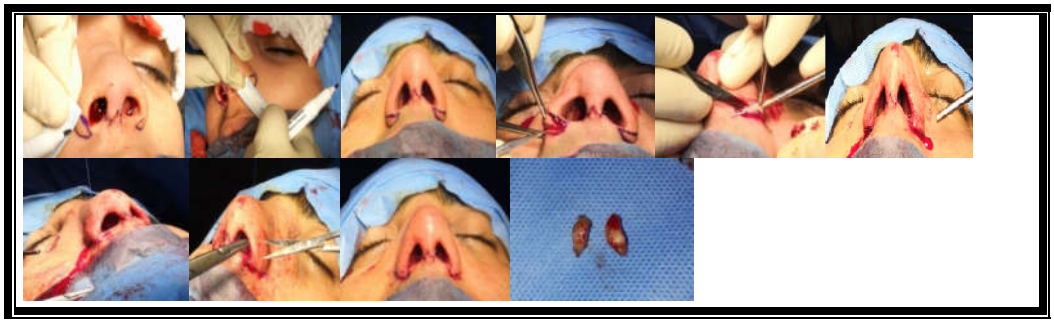
Patient consent: All the patient were informed consented about the operation, follow up, photograph taking and publishment of our study

Operative technique: All patients were operated under general anesthesia, oral endotracheal tube using hypotensive technique.

The patient was positioned in a reversed Trendelenburg position, open septorhinoplasty was the surgical approach, sterilization with 10% povidine iodine solution, drapping with exposed eyes and nose, trans-columellar incision (inverted v) was done with extension into bilateral marginal incisions, dissection and elevation of skin and soft tissue over the dome was done in cephalic direction till the nasion, the soft tissue between the medial crura of LLCs was dissected to expose the caudal end of septum, then the mucoperichondrial and mucoperiosteal flaps were elevated bilaterally to expose the septum for septoplasty which was done as a corrective procedure for septal deviation and for harvesting of cartilage for strut grafting and spreader grafting in some cases as needed, the attachment of ULCs to the septum was identified and separated from the septum, dehumping of cartilaginous and bony humps, rasping for smoothening, medial and lateral osteotomies were done to manage deviations in bony vault, tip plasty was done to patients that were presented with tip deformity and columellar strut inserted between the two medial crura of the LLCs, transdomal and Interdomal suturing were done using 5/0 vicryl (absorbable), the inverted V incision and marginal incisions were closed, the alar base reduction was done as the final step in rhinoplasty as any change in tip projection will have a direct effect on alar base configuration and for proper judgment of the amount of alar base reduction, three types of operations were used to reduce the wide alar base and selected according to the type of the nasal base as follows: Type 1 operation: combined external alar wedge resection plus internal nostril floor resection was used for patients that have wide alar base with flaring. Type 2 operation: external alar wedge resection was used for patients that have normal alar base with flaring only. Type 3 operation: internal nostril floor resection was used for patients that have wide alar base only. A *Castroviejo caliper* was used to measure the distance from the midcolumellar point to the alar crease, on each side, to detect any difference in width of the nasal sill, which may require asymmetric resections from the nasal vestibule, the amount of internal vestibular resection was carefully measured by the caliper, the location of the two stabs is more important than the distance between them so the medial stab on each side was precisely located at equal distance from the midcolumellar point to ensure creating symmetrical bilateral sill creases, the lateral stab which marks the lateral limit of the internal

resection was done medial enough to preserve the natural curve of the alar rim where it meets the nostril floor at the outer lower angle of the nostril, the alar-facial groove was marked and the marking extended along the crease between the nostril sill and the upper lip until it meets the medial stab of the previously marked sill resection, the internal resection was done first by excising a triangular wedge of the sill and vestibular floor, the base of the wedge was between the two stabs at the nostril rim and its apex was extended intranasally and laterally creating a 30 to 45 degree angle from the vertical plane so according to the width of the internal resection, a number 15 blade was used for performing external alar and internal vestibular resections, an external alar resection was done at the alar-facial groove, this results in the detachment of the alar lobule from the face at the natural alar–facial crease, the anteroinferior end of the newly created alar flap was rotated downwards and medially into the vestibular floor defect and fixed to the medial corner of the defect by a 6-0 prolene mattress suture, closure of internal resection was performed using an interrupted 5-0 Vicryl sutures, the alar crease incision was closed using an interrupted 6-0 prolene sutures, in all patient bilateral silastic sheets were put intranasally and sutured to the septum, bilateral anterior nasal packing, external strip plaster and external nasal splint were applied.

Type 1: Operation (combined external alar wedge resection plus internal nostril floor resection).



Type 2: Operation (external alar wedge resection).

Statistical Analysis: The collected data were introduced into Microsoft excel sheet 2016 and loaded into SPSS (Statistical Package for the Social Sciences) v26 statstical program. Descriptive statistics were presented using tables (mean±standard deviation), frequencies and graphs.T test and one way ANOVA (Analysis of Variance) were used to find out significance of differences between means of related continuous normally distributed variables (Shapiro test) was used to test normality of distribution. Mann Whitney, Wilcoxon & Kruskal Wallis and Mcnemar tests were used to find out significance of differences between not normally scaled data.

P value < 0.05 was considered as discrimination point for significance in all mentioned tests.

RESULTS:

In this prospective study, 40 patients underwent primary open septorhinoplasty.

Gender distribution: table1 shows that 28(70%) out of 40 were females which represent the most prevalence and the rest 12(30%) were males**,** so the male to female ratio was 3:7.

Table 1: Distribution of study sample according to gender .

Gender	Male	12	30%	Male:Female ratio
	Female	28	70%	3:7

Age distribution: The age range was (18-44) years and the mean age was (29.1±7.36) years distributed into 35% aged (18-25) years, 42.5% aged (26-35) years and 22% aged more than 35 years as shown in table 2.

Table 2: Distribution of patients according to *age* .

Age (mean± std.dev.) yr		29.1 ±7.36 yr	
		No.	%
Age groups	18-25 yr	14	35%
	26-35 yr	17	42.5%
	>35 yr	9	22.5%

Distribution of study sample according to the main complaint: The main complaint of 12.5% of patients was nasal obstruction while 25% suffered from nasal deformity and 62.5% suffered from both complaints as shown in table 3.

Table 3: Distribution of study sample according to chief complaints .

		No.	%
Main complaint	Nasal obstruction	5	12.5
	Nasal deformity	10	25
	Nasal obstruction and deformity	25	62.5

Distribution of study sample according to the type of nasal base and operation types: The classification of patients according to the type of nasal base depending on the current results; 18(45%) of patients have a wide alar base plus flaring so they were exposed to type 1 operation (combined external alar wedge resection plus internal nostril floor resection) and 12(30%) of patients have a normal alar base with flaring only so they were exposed to type 2 operation (external alar wedge resection) while 10(25%) of patients have a wide alar base only; therefore, they were exposed to type 3 operation (internal nostril floor resection) as shown in table **4.**

Table 4: Distribution of study sample according the type of nasal base and operation type.

Type of nasal base	Operation type	No.	%
Wide alar base + flaring	1	18	45%
Flaring only	2	12	30%
Wide alar base only	3	10	25%

Distribution of study sample according to the width of internal nostril floor and external alar wedge resection: The width of internal resection(IR) in 35% of patients were from (0-3) mm and 50% of them were from (4-6) mm while only 15% were from (8-9) mm, the mean = 3.675±2.758 and the width of external resection(ER) was from (0-3) mm in 30% of the patients and from (4-7) mm in 50% and from (8-9) mm in only 20% of them , the mean = 4.45±3.137 as shown in Table (5) and table (6) respectively.

Table 5: Distribution of study sample according to the *width of IR*.

Mean±SD	3.675 ±2.758	
width of IR	No.	%
0-3mm	14	35
4-6mm	20	50
7-8mm	6	15

Table 6: Distribution of study sample according to *the width of ER*.

Mean±SD	4.45±3.137	
width of ER	No.	%
0-3mm	12	30
4-7mm	20	50
8-9mm	8	20

Results of Rhinoplasty Outcome Evaluation (ROE) for nasal appearance satisfaction: Table (7) shows that there was no significant difference between the medians of ROE score according to age groups (P value = 0.566) and no significant difference between the medians of ROE score after the operation according to their age groups (P value = 0.068) according to Kruskal Wallis test, but the median of ROE score after the operation was significantly higher than ROE score before the operation in all age groups (P value < 0.05) according to Wilcoxon test, all the patients were satisfied postoperatively in varying degrees.

Table 7:Differences between ROE scores according to age groups and time of measurements .

		ROE scoe before				ROE score after				
Age group	No.	Mean	SD	Median	IQR	Mean	SD	Median	IQR	PV*
8-25 yr.	14	19.04	8.6	16.66	3.5	49.69	22.25	50	41	0.001
26-35 yr.	17	25.48	16.5	16.66	27.08	57.35	28.51	58.33	45.83	0.001
>35 yr.	9	22.21	9.32	16.66	16.66	72.68	6.9	70.83	12.5	0.008
P Value**				0.566				0.068		
*according to Wilcoxon test					**according to Kruskal Wallis test					

Table(8)shows that there was significant difference between medians of ROE score according to gender before the operation (P value = 0.001)and significant difference between medians of ROE score after the operation (p value=0.006) according to Mann-Whitney test, while the median of ROE score after the operation was significantly higher than ROE score before the operation in both genders (P value < 0.05) according to Wilcoxon test.

Table 8: Differences between *ROE scores* according to *gender*.

Gender		ROE score before				ROE score after				*P
	No.	Mean	SD	Median	IQR	Mean	SD	Median	IQR	value
Male	12	38.76	4.04	26	21.8	73.9	22.19	66	28.1	0.002
Female	28	16.8	6.56	16.6	4.1	51.3	21.96	52	46.5	0.001
**P value				0.001				0.006		
*according to Wilcoxon test, **according to Mann-Whitney test										

Nasal Obstruction Symptoms Evaluation (NOSE) score results: Table (9) shows that there was no significant difference between the medians of NOSE score before the operation according to age groups (P value=0.066) but there was significant difference between the medians of NOSE score after the operation for the benefit of older age group (P value = 0.001) according to Kruskal Wallis test, while the median of NOSE score after the operation was significantly lower than that before the operation in all age groups (P value < 0.05) according to Wilcoxon test.

Table 9: Differences between NOSE scores according to age groups and time of measurements.

		NOSE score before				NOSE score after				
Age group	No.	Mean	SD	Median	IQR	Mean	SD	Median	IQR	*P V
18-25 yr	14	26.79	12.65	20	25	16.43	4.13	15	5	0.016
26-35 yr	17	35	18.88	40	40	20.29	9.27	20	5	0.006
>35 yr	9	42.78	7.12	44	12.5	33.89	4.86	30	10	0.042
**P V				0.066				0.001		
*according to Wilcoxon test, **according to Kruskal Wallis Test										

Differences between NOSE scores according to gender: Table (10) shows that there was significant difference in the NOSE score before the operation according to gender (P value= 0.004) but the difference was not significant after the operation (P value= 0.473) according to Mann-Whitney test, while the median of NOSE score after the operation was significantly lower than before the operation in both genders (P value less than 0.05) according to Wilcoxon test.

Table 10 : Differences between NOSE scores according to gender.

	No.	NOSE score before				NOSE score after				*P value
Gender		Mean	SD	Median	IQR	Mean	SD	Median	IQR	
Male	12	44.6	14.99	50	18.75	20.42	8.38	17.50	5	0.004
Female	28	29.29	13.86	35	25	22.68	10.05	20	15	0.004
**P value				0.004				0.473		
*according to Wilcoxon test, **according to Mann-Whitney test										

Results of operation regarding Nostrils Symmetry: Table (11) shows that there was a significant increase in the frequency of nostrils symmetry from 18 patients to 33 (45% to 83%) after the operation (P value= 0.001) according to McNemar test**.**

Table 11: Effect of operation on Nostrils symmetry.

Nostril symmetry before	Nostril symmetry after		Total	*P value
	Symmetry	Asymmetry		
Symmetry	18	0	18	0.001
Asymmetry	15	7	22	
Total	33	7	40	
*According to McNemar test				

Results of operation regarding to alar flaring: As shown in table (12), the operation succeeded in changing significant number with flaring alae, 30 patients (75%) to non flaring alae, 7 patients (17%) (P value= 0.001) according to McNemar test.

Table 12: Effect of operation on Flaring.

Flaring before	Flaring after		Total	*P value
	Flaring	No flaring		
Flaring	7	23	30	0.001
No flaring	0	10	10	
Total	7	33	40	
*According to McNemar Test				

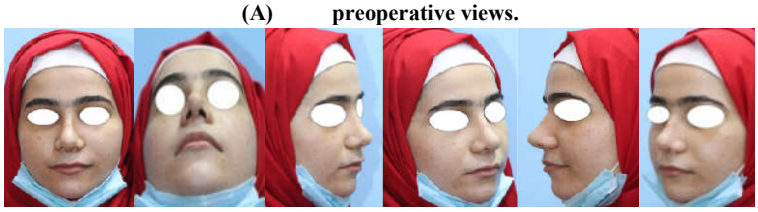
Difference between preoperative and postoperative IAD/ICD ratio: Table (13) shows that the ratio of interalar distance (IAD) to intercanthal distance (ICD) after the operation (1.034 ±0.015) was significantly lower than that before the operation (1.234±0.038), (P value= 0.045) according to paired samples t test.

Table 13: Difference between preoperative and postoperative IAD/ICD ratio.

	No.	Mean	Std. Deviation	*P value
IAD/ICD before	40	1.234	0.038	0.045
IAD/ICD after	40	1.034	0.015	

*According to Paired Samples t test

(A) preoperative views.



(B) postoperative views.

(A) preoperative views.

(B) postoperative views.

Since the introduction of the concept of alar base reduction, numerous techniques and various modifications have been devised for alar base modification, yet it still remains one of the most controversial and sometimes confusing aspects of rhinoplasty.[7] **Gender Distribution :** In present study, (30%) of patient were males versus (70%) were females; as a ratio of male to female 1:3. This result similar to another study conducted by Russell W. H. Kridel et al in (2005)[8], that found the ratio of male to female was 1:3 as (25%, 75%) respectively. Also the result of our study is similar to another study conducted by Jeremy P.Warner et al in (2010)[9], also expressed the same ratio of male to female which is 1:3 (26%, 74%). Another study conducted by Norihiro Ohba et al in (2016)[10], which shows the predominance of the females in their study in which was 50 patients taken 46

(92%) were females and 4 (8%) were males. A study conducted by Ji Heui Kim et al in (2016)[11], 73 patients were taken 50 males (69%) and 23 females (32%), which disagrees with the results of our study. The possible explanation of these differences might be related to variations in study setting and the different in sample size.

Age Distribution: The age distribution in present study was (18-44) years, mean age was (29.1) years. In Russell w. h. kridel et al. (2005)[9], the mean age was (30.4) years. In Norihiro Ohba (2016)[10] , the mean age was (26.3) years. In Kim JH et al (2016)[12] , the mean age was (36.5) years. These studies are close to the present study in the mean age. **Nasal flaring:** The presence or absence of alar flaring, in the current study, 30 patients (75%) of total patients have nasal flaring preoperatively, while postoperatively the nasal flaring reduced to only

7 patients (17%) of total patients, with significant association (P value=0.001). This result is similar to study conducted by Kim JH et al. (2016)[11] that found reduce in the frequency of alar flaring from 60 patients (82%) to 15 (21%) with significant association (P value= 0.04). **Nostril symmetry:** Regarding to nostril symmetry, there was also a significant increase in the frequency of nostril symmetry from 18 patients to 33 (45% to 83%) after the operation. This result similar to a study conducted to by Kim JH et al. [11] that found an increase in the frequency of nostril symmetry from 38 patients (52%) to 46 (63%)

(P value< .001). **Ratio of IAD to ICD:** There are many reports describing the specific surgical techniques at alar base, but few studies detected the results of these techniques and outcome of alar base reduction. In our study the the mean (SD) ratio of interalar distance to intercanthal distance significantly decreased from (1.234±0.038) to (1.034 ±0.015), (P value= 0.045). In a study conducted by kim HJ [11] in which the surgical outcomes of combined sill and alar excision were analyzed in patients with a wide nasal base and alar flaring.This technique combines alar wedge resection (to decrease the alar flare) with nostril sill resection (to approximate the alae); and found that combined sill and alar excision significantly decreased the mean (SD) ratio of interalar distance to intercanthal distance from 1.07 (0.11) to 1.04 (0.08) after surgery (P < .001). **Width of the internal vestibular and external alar wedge resection:** In our study, the 40 cases subjected to a combined external alar and internal resection, the internal resection was inclined 30-45 degrees laterally in all cases. The mean width of the internal vestibular resection was 3.675 mm (range 1-8 mm) and the mean width of the external alar wedge resection was 4.45 mm

(range 3-9 mm). A study done by Norihiro Ohba (2016)[10] in which the mean width of the internal resection was 4.8 mm and the mean width of the external alar width was 4.4 mm, these results are very close to the results of the present study. This result approximates the result of a study conducted by Hossam M.T foda (2011)[7] in which the mean width of the internal resection was 3.2 mm (range 2-5 mm) and the mean width of the external alar wedge resection was 3.8 mm (range 2-8 mm). Also, the results approximates the result of the study conducted by Garret H. et al. (2005)[12] regarding the mean width of the internal resection was 3.2 mm (range 0-7mm) while the mean width of the external alar resection was 1.6 mm (range 0-4mm) which is significantly less than that our study. In a study conducted by Ismail et al (2011)[13], the mean width of the internal resection was 2.9 mm (range 1.9-7 mm) which is less than the mean in our study, while the mean width of the external alar resection was 6.3 mm (range 3.5 -10 mm) more than that in our study.

CONCLUSION:

Alar base reduction using combined external alar wedge resection plus internal nostril floor resection, external alar wedge resection or internal nostril floor resection and according to the type of wide alar base (wide alar base with flaring, normal alar base with flaring only and wide alar base only respectively) are effective techniques with good outcomes regarding patients satisfaction and without worsening the functional outcomes. The internal vestibular resection that is inclined 30-45 degree laterally together with placement of the external alar wedge resection in the natural alar facial crease result in a natural curvature of the alar rim and an inconspicuous scar well hidden in the depth of the natural alar crease respectively and aesthetically pleasant results

Abbreviations

ER	External resection	LLCs	Lower lateral cartilages
IR	Internal resection	ULLCs	Upper lateral cartilages
IAD	Interalar distance	NOSE	Nasal obstruction symptoms evaluation
ICD	Intercanthal distance	ROE	Rhinoplasty outcome evaluation
INR	International normalize ratio	P value	Probability
IQR	Interquartile range	SD	Standard deviation

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