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Research Paper

A Comparative Study of Suturing Technique and Spreader Graft Placement in Hump Reduction of Primary External Rhinoplasty

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ABSTRACT:

BACKGROUND:

The nasal dorsal hump reduction is common among patients seeking rhinoplasty. This surgery must be based on conservative reduction of excessive nasal bone and cartilage with meticulous reconstruction of nasal dorsum by different techniques. These techniques are suturing, spreader graft or spreader flap to create pleasant dorsal aesthetic lines with preserving internal nasal valve function.

OBJECTIVE:

To evaluate and compare the nasal contour and patency between suturing technique and spreader graft placement in hump reduction of primary external rhinoplasty.

METHODS:

A prospective observational comparative study was done in which 21 patients were selected for hump reduction and then divided those patients randomly into two groups: Group A with spreader graft placement technique after hump reduction and Group B with suturing technique after hump reduction. The evaluation of all patients included the administration of a questionnaire, a clinical examination, and the documentation of photographs both before and after the surgical procedure. Additionally, follow-up assessments were conducted at the 1st, 3rd, and 6th months.

RESULTS:

(ROE) score, VAS scale, and photo documentation showed that group A was 100% satisfied with nose look postoperatively, while group B was 90% satisfied.

Both groups A and B showed 100% and 90% preserved nasal patency, respectively, according to nasal obstruction symptoms assessment (NOSE) and visual analogue scale for nasal patency.

CONCLUSION:

Spreader graft placement and suturing technique have a similar effect on reconstruction of nasal appearance and preservation of nasal patency except in selected situations.

KEYWORDS: Spreader graft, Hump dorsal surgery, Rhinoplasty.

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INTRODUCTION:

Rhinoplasty is well recognized as a complex and intricate surgical technique within the field of plastic surgery. The primary motivation for patients to pursue cosmetic rhinoplasty is often the appearance of a noticeable dorsal hump. Dorsal hump surgery is a conservative approach to reduce extra nasal tissue and carefully reconstruct the nasal dorsum in order to provide aesthetically pleasing brow lines and maintain the function of the internal nasal valve [(1)]. The rhinoplasty surgeon must be knowledgeable about the underlying nasal anatomy and prioritize the external nasal valve, internal nasal valve, nasal septum, turbinate, and nasal mucosa. The internal nasal valve represents the most constricted portion of the nasal cavity, which can cause nasal obstruction symptoms [(2)]. A nasal hump removal or reduction is a popular technique in corrective aesthetic nose surgery. Hump reduction is commonly desired by patients for cosmetic reasons. Functional reasons for hump removal are uncommon [(3)].

The reconstitution of the dorsum is performed with the goal of preserving the T-shaped contour, which is crucial for achieving balanced dorsal aesthetic lines and maintaining the integrity of the internal valves. To achieve this, it is necessary to properly reconstitute the upper lateral cartilages using sutures (the most commonly used method), spreader flaps, and/or spreader grafts (if deemed necessary). Typically, three types of dorsal reconstitution techniques are employed [4].

In literature, a comparative study was conducted to evaluate the efficacy of spreader grafts and flaps in mid-nasal vault reconstruction. The study included 40 patients and concluded that both spreader grafts and flaps yield similar and effective outcomes in reducing nasal resistance [5].

AIM OF THIS STUDY:

is to evaluate and compare the nasal contour and patency between suturing technique and spreader graft placement in hump reduction of primary external rhinoplasty

PATIENTS AND METHODS:

This study had been done by surgeons of otolaryngology department at Al-Imamein Al-Khadhimein Medical City for a whole year.

Study Design

A prospective, observational and comparative study was conducted on 21 patients (12 females, 9 males) with humpy noses, their age range (18-49) years. All underwent a primary external rhinoplasty approach. Patients were divided into two groups: group A (11 patients) with spreader graft placement and group B (10 patients) with suturing technique.

Patients who were over 18 years old and had a dorsal hump with or without tip deformity were included, while patients with septal deviation, rhinosinusitis symptoms, recent nasal trauma, inferior turbinate hypertrophy and previous rhinoplasty were excluded.

All patients were subjected to preoperative assessment by history, examination, routine preoperative investigations and followed up at 1^{st},3^{rd} and 6^{th} months postoperatively for aesthetic and functional assessment.

Subjective Assessment of the Patient

Preoperatively, the subjective assessment by:

(A): ROE[6] questionnaire which was designed by Alsarraf, that evaluates the pre and postoperative functional and aesthetic components of patient satisfaction as shown in the following chart:

1) **How much do you like the appearance of your nose?**
   Absolutely no (0), A little (1), More or less (2), Very much (3) Absolutely yes (4)
2) **How much can you breathe through your nose?**
   Absolutely no (0), A little (1), More or less (2), Very much (3) Absolutely yes (4)
3) **How much do you think your friends and those close to you like your nose?**
   Absolutely no (0), A little (1), More or less (2), very much (3) Absolutely yes (4)
4) **Do you think the appearance of your nose to your social or professional activities?**
   Always (0), Frequently (1), Sometime (2), Rarely (3) Never (4)
5) **How confident are you that your nose has the best possible appearance?**
   Absolutely no (0), A little (1), More or less (2), Very much (3) Absolutely yes (4)
6) **Would you like to surgically change the appearance or function of the nose?**
   Certainly yes (0), Very likely yes (1), Possibly yes (2), Probably no (3), Certainly no (4)

The questions were answered within a scale of scores between zero and 4, then the sum of all responses from each question was divided by 24 and multiplied by 100 and from that obtained the final value varied between zero to 100 (zero represents minimum satisfaction and 100 the maximum one), and the results were classified into 4 divisions as follows: from zero to less than 25 was tagged as poor, 25 to less than 50 (acceptable), from 50 to less than 75 (good), and from 75 to 100 was tagged as excellent **(B)** Nasal obstructive symptoms evaluation scale (NOSE)[7] questionnaire

	not a problem	very mild problem	moderate problem	fairly bad problem	sever problem
Nasal congestion or stiffness	0	1	2	3	4
nasal blockage or obstructions	0	1	2	3	4
trouble breathing through my nose	0	1	2	3	4
trouble sleeping	0	1	2	3	4
unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

(c) The Visual Analogue Scale (VAS) is a measurement tool utilized to assess a certain trait or attitude that is believed to span a continuum of values and is not easily quantifiable through direct measurement. Typically, the VAS consists of a horizontal line, measuring 100 mm in length, with word descriptors placed at either end to serve as anchors [8].

Surgical technique

Open rhinoplasty approach

Trans columellar incision (inverted v).

Osseocartilaginous hump reduction by composite method. Septal mucoperichondrial flaps from above are raised and then the attachment of upper lateral cartilage to the septum is identified and separated from the septum. Medial and lateral osteotomies were done. Tip plasty was done on patient who presented with tip deformity.

The spreader graft (SG) had already been prepared from nasal septum, its length and width (1.5-2.5 cm length, 3-5 mm width, 1-3 thickness) and may change length and width in relation to the defect correction. The SG was placed in its position between dorsal septum and upper lateral cartilage in group (A) while in group (B)**,** we used the primary suturing technique by 5-0PDS for midvault restoration.

Postoperatively, the patients had given instructions about post rhinoplasty care and regular visits to surgeon at 1st, 3rd, and 6th months for follow up and reassessment about satisfaction of appearance and nasal patency by using (ROE) score and (NOSE) score respectively and also photographs were taken for comparing pre and post results.

RESULTS:

The mean age of all patients was 29.29 ± 8.52. The mean age of group A) was 26.64±6.77, while group (B) was 32.2 ± 9.6.

Preoperatively, according to ROE and VAS score group (A) found 7 patients (63.6%) were not satisfied with nasal appearance and 3 patients (27.3%) were somewhat satisfied while one patient (9.1%) with moderate satisfaction.

Postoperatively, according to ROE and VAS scores, we found 6 patients (54.5%) were very much satisfied for nasal appearance, 5 patients (45.5%) were completely satisfied. The scores obtained from pre and post-operative results, the p-value was <0.001, (highly significant) subjective changes in nasal appearance as shown in table (1)

Table 1: Comparison of nasal look with spreader graft placement between pre- and post-operatively according to ROE and VAS.

Nasal appearance scale	Pre-operative No. (%)	Post-operative No. (%)	P value
0-20	7 (63.6)	0 (0.0)	< **0.001**
21-40	3 (27.3)	0 (0.0)	
41-60	1 (9.1)	0 (0.0)	
61-80	0 (0.0)	6 (54.5)	
81-100	0 (0.0)	5 (45.5)	

Preoperatively, according to ROE and VAS scores, the results show that the group (B) 3 patients (30%) were not satisfied with nasal appearance, 6 patients (60%) were somewhat satisfy to nasal appearance while only one patient (10%) moderately satisfied with nasal appearance. Postoperatively, according to ROE and VAS scores, the result shows that, 5 patients (50%) were very much satisfied with their nasal appearance, 4 patients (40%) were completely satisfied with

their nasal appearance while one patient (10%) was somewhat satisfied with their nasal appearance, which may require revision rhinoplasty in the future. In the scores obtained from pre and post-operative results, the p-value was (0.002), which indicate (significant) subjective changes in nasal appearance in this group (B) as shown in table (2).

Table 2: Comparison of nasal appearance with suturing technique between pre- and post-operatively according to ROE and VAS.

Nasal appearance scale	Pre-operative No. (%)	Post-operative No. (%)	P value
0-20	3 (30.0)	0 (0.0)	**0.002**
21-40	6 (60.0)	1 (10.0)	
41-60	1 (10.0)	0 (0.0)	
61-80	0 (0.0)	5 (50.0)	
81-100	0 (0.0)	4 (40.0)	

In comparison between group (A) and group (B) for nasal appearance we found a p value was (0.561), which indicates (not significant) in the results postoperatively between the two groups.
Pre-operatively, in group (A) according to NOSE and VAS score, we found 7(63.6%) patients were no impairment in nasal patency, 4(36.4%) patients were very mild.
Postoperatively, according to NOSE and VAS scores, we found 7 patients (63.6%) were no impairment, 4(36.4%) patients were very mild impairment. The scores obtained from pre and post-operative results, the p value (1.000), indicate (not significant) subjective changes in pre and post-operative.
Pre-operatively, according to NOSE and VAS scores, in group (B) 6 patients (60%) were no problem in nasal patency, 4 patients (40%) had a very mild problem with nasal patency.
Post operatively, according to NOSE and VAS scores, 5 patients (50%) were no impairment in nasal patency, 4 patients (40%) were very mild impairment in nasal patency. While 1(10%) had moderate impairment in nasal patency.
In the scores obtained from pre and post-operative results, the p value was (0.58), which indicate a (not significant) subjective change in nasal patency in pre and post-operatively.
In comparison between two groups in nasal patency post-operatively, the p value was (0.525), (not significant) subjective change in nasal patency between two groups.

(A) Preoperative

(B) (B) Postoperative

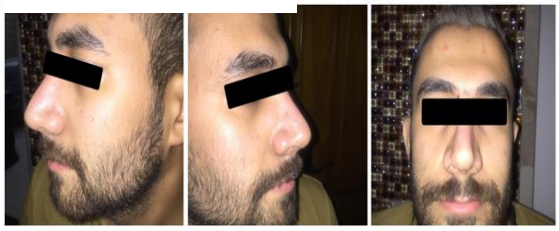
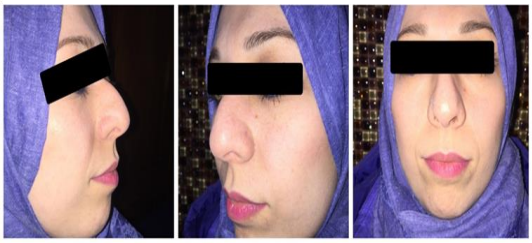


Figure 1: Patient with suturing technique

(A) Preoperative



(B) Postoperative

Figure 2: Patient with spreader graft placement

In the present study, (42.85%) of patients were males; versus (57.15%) were females. The mean age was 29.29, SD was 8.52, which is close in value to the studies done by Jalali [9] (2014), mean age was 28.3 SD was 6.9, Eren et al[10] (2014), mean age was 32.2 SD was 6.3, Karamese et al [11] (2016), mean age was 29 years.

Rhinoplasty Outcome Evaluation (ROE)

Baykal et al. [12] conducted a study in 2014 using ROE to compare the satisfaction of patients with different nasal deformities and discovered that patients with hump deformities were the most satisfied group. Eren et al [10] (2014) used the subjective questionnaire in there study, both of these studies matched the current study

Nasal Obstruction Symptoms Evaluation (NOSE) scale

For subjective assessment of nasal patency, we used pre and post-operative brief designed questionnaires at outpatient department, which were validated by Stewart et al. [7] (2004). Other studies, such as Rhee et al. [13] (2005) and Most [14] (2006), Ragab and Khodair [16](2005) and Eren et al [10] (2014) assumed that the questionnaire provide a helpful subjective assessment of nasal patency pre and post-operatively, which aligns with the present study. However, Kahraman et al. study [15] (2015), suggested that NOSE scale be used to evaluate the nasal patency in nasal surgeries in addition to objective methods.

Patient satisfaction with nasal appearance

In the group (A), the researchers find that the percentage of patients who are satisfied with their nasal appearance postoperatively is high (P value <0.001), is a highly significant result, depend on ROE, VAS and photos, follow up for about 6 months Concerning group(B), it is found that the percentage of patients who are satisfied with their nasal appearance postoperatively is also high: (P value=0.002), which is a significant result.

Roostaeian et al. [17] (2014), depended on photographs pre and post-operatively, using suturing technique in 65% of patients 25% reapproximating and 10% spreader flap to do the dorsal reconstruction in hump reduction; follow up was 19 months. Their conclusion was that the patient can be provided with durable cosmetic and functional results without the need for the use of SG and this definitely agrees with the group (B) results.

In Eren et al. study [10] (2014), depends on VAS scale for patient satisfaction, they used suturing technique in dorsal reconstruction after hump reduction follow up was 12.6 months, and they found the suturing technique was reliable method for reconstructing the nasal dorsum this agrees with the group(B) results.

In Manavbaşı and Başaran's study [18] (2011) they used suturing technique for 41% of patients to reconstruct the nasal dorsum after hump reduction, follow up was 17 months, and their conclusion was no narrowing in the nasal dorsum, which agrees with the group(B) results. In Karamese et al [11] (2016), which was done for 27 patients, aesthetic results were evaluated by photographs, and used SG placement to reconstruct the middle third of nose, their conclusion was that a symmetry of middle third of nose and aesthetic brow tip lines were obtained in the patients, which is agree with group (A) results.

Nasal patency

About group(A) there was no change in nasal patency in pre and post-operatively P value=1.000 which was not a significant result depending on NOSE scale.

In group(B) there was mostly no change in nasal patency pre- and post-operatively P value =0.58 which was not a significant result.

In previous studies by, Jalali [9] (2014), Manavbaşı and Başaran [18] (2011), and Eren et al [10] (2014), all of them found the suturing technique prevent nasal valve collapse which matching with the group (B) results. While in Ragab and Khodair's study [16] (2005), they dealt with a group of patients that was divided into two equal groups. The first group uses suturing technique and the other group uses SG placement, followed subjectively and by otoscope through a medium sized ear speculum. Their conclusion was that the group with SG had significantly fewer nasal complains but patients with suturing technique had a high rate of internal nasal valve stenosis. So, this study disagrees with group (B) results and agrees with group (A) results.

Moreover, Sabarirajan et al. [19] and Taş and Erden [20], have conducted a group of patients who underwent rhinoplasty with SG placement and both of them concluded that nasal function and contour have improved with SG. Hence, their conclusion goes with group (A) result.

There was only one case (10%) in group (B) with suturing technique presented post-operatively with nasal dorsum irregularity and impairment in nasal patency that may need revision rhinoplasty.

Many factors can impact nasal patency post operation: placement of nasal osteotomy, wound contracture as well as cartilaginous dorsum over resection.

Dorsal nasal irregularity may be due to different causes: irregular osteotomy, dorsal callus formation, and fibrosis which are obvious in patients with thin skin.

CONCLUSION:

Spreader graft placement and suturing technique have a similar effect on reconstruction of nasal appearance and preservation of nasal patency except in selected situations in hump reduction of primary external rhinoplasty.

REFERENCES:

1. Bohluli, B.; Moharamnejad, N.; Bayat, M. Dorsal hump surgery and lateral osteotomy. *Oral and Maxillofacial Surgery Clinics*, 2012;24:75-86.
2. Lee, M.R.; Rohrich, R.J.; Adams, Jr. WP. Dallas Rhinoplasty. *3rd ed. Taylor and Francis group, LLC*, 2014 :38- 9.
3. Huizing, E.H.; de Groot, J.A.M. Functional reconstructive nasal surgery. *2nd ed. Germany: Thieme*, 2015: 232- 9.
4. Rohrich, R.; Ahmad, J.; Roostaienen, J. Evaluation and surgical approach to the nasal dorsum: Component dorsal hump reduction and dorsal reconstitution. *Dallas Rhinoplasty: Nasal Surgery by the Masters. 3rd ed. St. Louis: Quality Medical*, 2014: 219-48
5. Zeid, N.G.; Mohamed, A.S.; ElSayed ElFouly, M.; Azooz, K.O.; Aleryan, M.M., Abd Elmottaleb Sabaa, M. Objective Comparison Between Spreader Grafts and Flaps for Mid-Nasal Vault Reconstruction: A Randomized Controlled Trial. *Plastic Surgery*, 2020;28:137-41.
6. Alsarraf, R. Outcomes research in facial plastic surgery: a review and new directions. *Aesthetic Plast Surg*, 2000; 24: 192-97.
7. Stewart, M.G.; Witsell, D.L.; Smith, T.L.; Weaver, E.M.; Yueh, B.; Hannley, M.T. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. *Otolaryngol Head Neck Surg*, 2004;130:157-63.
8. Wewer, M.E.; Lower, N.K. Critical review of visual analogue scale in the measurement of clinical phenomena. *Nursing and Health*,1990;13:227-36.
9. Jalali, M.M. Comparison of effects of spreader grafts and flaring sutures on nasal airway resistance in rhinoplasty. *Eur Arch Otorhinolaryngol*, 2015;272:299-93.
10. Eren, S.B.; Tugrul, S.; Ozucer, B.; Meric, A.; Ozturan, O. Autospreading spring flap technique for reconstruction of middle vault. *Aesthetic Plast Surg*, 2014;38:322-28.
11. Karamese, M.; Koplay, T.G.; Akdag, O.; Yildiran, G.; Tosun, Z. Abstract: Functional and aesthetic outcomes of spreader graft in rhinoplasty. *Plast Reconstr Surg Glob Open*, 2016; 4(9 Suppl): 207-8.
12. Baykal, B.; Erdim, I.; Kayhan, F.T.; Oghan, F. Comparative analysis of nasal deformities according to patient satisfaction. *J Oral Maxillofac Surg*, 2014;72: 603.e1-7
13. Rhee, J.S.; Poetker, D.M.; Smith, T.L.; Bustillo, A.; Burzynski, M.; Davis, R.E. Nasal valve surgery improves disease-specific quality of life. *Laryngoscope*, 2005;115: 437-40.
14. Most, S.P. Analysis of outcomes after functional rhinoplasty using a disease-specific quality-of-life instrument. *Arch Facial Plast Surg*, 2006;8:306-9.
15. Kahraman, E.; Cil, Y.; Incesulu, A. The effect of nasal obstruction after different nasal surgeries using acoustic rhinometry and nasal obstruction symptom evaluation scale. *World J Plast Surg*, 2016;5:236-43.
16. Ragab, A.; Khodair, F. Reconstruction of the internal nasal valve in external functional-cosmetic rhinoplasty. *Egypt J Plastic Reconstr Surg*, 2005;29:135-39.
17. Roostaeian, J.; Unger, J.G.;Lee, M.R.; Geissler, P.; Rohrich, R.J. Reconstitution of the nasal dorsum following component dorsal reduction in primary rhinoplasty. *Plast Reconstr Surg*, 2014;133:509-18.
18. Manavbaşı, Y.I.; Başaran, I. The role of upper lateral cartilage in dorsal reconstruction after hump excision: section 1. Spreader flap modification with asymmetric mattress suture and extension of spreading effect by cartilage. *Aesthetic Plast Surg*, 2011;35:487-93.
19. Sabarirajan, P.; Sandeep, T.; Himani, L.; Rohit, B. Assessment of Functional and Esthetic Outcomes of External Approach Septorhinoplasty with Spreader Graft in North India. *Saudi Journal of Otorhinolaryngology Head and Neck Surgery* ,2022;24:12-16.

20. Taş, B.M., Erden, B. Comparison of nasal functional outcomes of let down rhinoplasty and open technical rhinoplasty using spreader graft. *Eur Arch Otorhinolaryngol*, 2021;278: 371-77.