

The Role of Fascia Lata Graft in Treatment and Camouflage of Nasal Dorsum Irregularities

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Abstract

Background: Nasal dorsal irregularities after rhinoplasty are troublesome for both patient and surgeon, especially in patients with thin dorsal skin, which may be seen after improper hump reduction and multiple surgeries. Many types of grafts have been used for nasal contouring, augmentation and camouflage as diced cartilage, fascia, dermal grafts, alloderm and banked allograft.

Methods: We report the use of Fascia Lata (FL) graft for dorsal contouring and camouflage in 20 patients who underwent rhinoplasty between May 2015 to September 2016. There were 12 male and 8 female patients, with ages ranging from 18 to 43 years (mean age: 30.35). Of the 20 patients, 12 underwent primary rhinoplasty, while 8 were secondary cases. An informed consent was obtained from all patients for the use of FL graft. The graft was harvested from the right lateral thigh. A simple method was used to place the graft over the nasal dorsum. Post-operative follow-up period was 16 months. Clinical evaluation was made by inspection, palpation and photographic documentation.

In addition, a questionnaire related to patient satisfaction and donor-site morbidity.

Results: All patients had satisfactory aesthetic results, and no apparent irregularities were observed over the nasal dorsum. The questionnaire results showed that all patients, but one, were satisfied with surgery, and were not concerned about donor-site scar; however, one patient had donor-site morbidity.

Conclusions: This study conclusively shows that it is a reliable, simple method for camouflaging any post-operative dorsal irregularities, particularly in patients with thin nasal skin.

Key Words: Rhinoplasty – Fascia lata – Camouflage – Nasal dorsum.

Introduction

RHINOPLASTY is the most commonly performed procedure of facial plastic surgery. Perhaps no

other procedure combines the degree of artistic and technical details affecting both form and function to the same extent as rhinoplasty. This makes it the most challenging, humbling, and variable of all cosmetic procedures in facial plastic surgery [1].

Patients report to rhinoplastic surgeons for varied complaints like visible nasal deformity or nasal blockage. Reconstruction of the dorsum is difficult and requires good pre-operative planning, intra-operative implementation and post-operative care [2].

Rhinoplasty has grown and developed over so many years but the choice of graft material still remains debatable [2].

Irregularities and adhesions to the underlying structures in the nasal dorsum may be seen after rhinoplasty surgery or nasal trauma. Dorsal irregularity is reported to occur in 7-10% of all primary rhinoplasties, requiring revision surgery. Thin skin is the major risk factor [3].

Nasal dorsal irregularities after rhinoplasty are troublesome for both patient and surgeon, especially in patients with thin dorsal skin, which may be seen after improper hump reduction and multiple surgeries [4].

Grafts are available in the forms of autologous, homologous, and allogenic tissues that are used for both the prevention and correction of dorsal nasal irregularities, particularly in the thin-skinned patient [5].

Fascia is frequently used in rhinoplasty, both in primary cases and in revision rhinoplasty cases. There are several reasons for using fascia in rhinoplasty: Fascia is resistant to infection, has a good

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survival rate, and is easy to shape yet strong enough to be sutured. The thickness of the fascia allows it to be sutured and to serve as the outer layer and container of diced cartilage [6]. So the aim of the study was conducted to the role of fascia lata graft in treatment of irregularities of nasal dorsum.

Patients and Methods

This is a prospective case series that was performed on twenty consecutive patients who underwent rhinoplasty using fascia lata graft at Otorhinolaryngology Department, Tanta University in the period from May 2015 to September 2016. The study was approved by the Institutional Ethical Committee. (Approval code: 30215/04/15) an informed consent was signed by every patient who participated in the study. Patients complaining of nasal dorsum minor irregularities undergoing primary or revision rhinoplasty were included in the study. Any patient less than 18 years or refuses participation in the study or having major irregularities in nasal dorsum was excluded in the study.

All the patients had preoperative initial consultation interview with the surgeon mainly for collection demographic data, taking general medical, surgical and rhinological history, listening to the patient's aesthetic, functional complaints and post-operative expectations.

Full clinical examination had been carried out including complete ENT examination, complete general examination, routine investigation for general anesthesia, patients will be examined by anterior rhinoscopy and endoscopic examination and facial analysis followed by photographic documentation using standard photographic profile view. All findings had been registered in patient's pre-operative sheet.

After reviewing the surgical goals, discussing all concerns and possible complications and obtaining signed informed consent for the surgery, the study carries some risks on the candidates as post-operative infection and deformity of the nose and can be treated by antibiotics and simple rhinoplastic techniques respectively and can be minimized by good operative techniques and sterilization. Any unexpected risks appear during the course of the research would be cleared to participants and the Ethical Committee on time and would be under close observation of highly specialized staff members in Tanta University Hospital.

Assessment of surgical outcome: Clinical evaluation was made by inspection, palpation and photographic documentation. Post-operative profile

and frontal photos were at least three months after surgery due to post-operative edema Fig. (4). Patients were evaluated for signs of infection, seroma formation, extrusion, and migration of materials, patient satisfaction with respect to irregularities of the nasal dorsum was also addressed using previously modified written forms based on a visual analogue score (0-100) pre-operatively and post-operatively on which patients could rate the appearance of their nose on a 100-point scale (0, very ugly; 100, very nice) also, an independent plastic surgeon evaluated the pre-operative and post-operative photos for nasal dorsum on the same VAS and the responses were recorded.

In addition, a questionnaire related to patient satisfaction and donor site morbidity was administered to patients 1 year after surgery. All the patients had undergone rhinoplasty under general anesthesia. The assessment of rhinoplasty-related patient satisfaction was performed using the Rhinoplasty Outcome Evaluation (ROE) questionnaire. The patients were asked to complete the Rhinoplasty Outcome Evaluation (ROE) questionnaire Fig. (3).

Surgical procedures:

All patients were operated upon under general anesthesia by the same surgeon. The FL graft (average size: 2 X 3cm) was uniformly harvested from the right lateral thigh by performing a 3-5cm incision, located 15-20cm proximal to the insertion of tensor FL muscle at the lateral side of knee joint. Overlying fat is dissected off of the fascia bluntly in the area of the fascia to be harvested and the fascia is gently elevated off of the underlying muscle Fig. (1).

We used an external approach through an inverted V-shaped transcolumellar incision under general anesthesia. Skin was elevated over the dorsum.

After a standard rhinoplasty procedure, FL is placed in the pocket of the dorsum Fig. (2). The transcolumellar incision was sutured closed. The graft was palpated to check its position. External nasal splinting was used to prevent displacement of the FL and anterior nasal packing.

Statistical analysis:

The data collected were analyzed by SPSS Software 20 (Chicago, IL). Mean values and frequencies were estimated. A *t*-test or Mann-Whitney test was used. The chi-square test or Fisher's exact test were used to analyze qualitative data. A $P < 0.05$ was considered statistically significant.

Results

Of the 20 patients, 12 underwent primary rhinoplasty, while 8 were secondary cases. FL graft was used to camouflage the possible dorsal irregularities in late post-operative period. All patients had satisfactory aesthetic results, and no apparent irregularities were observed over the nasal dorsum. The questionnaire results showed that all patients were satisfied with the surgery, and were not concerned about donor-site scar.

On comparison of mean total score percentage for ROE before and after surgery, it showed statistically significant difference when *p*-value was <0.001 Fig. (5), (Table 1).

Also comparison of patients' response to VAS before and after surgery and evaluation of independent rhinoplastic surgeon on the same VAS, it showed statistically significant difference when *p*-value was <0.001 Fig. (6), (Tables 2,3).



Fig. (1): Fascia lata graft harvesting.



Fig. (2): Placement of fascia lata graft over nasal dorsum.

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	Somewhat	Moderately	Very much	Completely
0	1	2	3	4

- 2- How well are you able to breathe through your nose?

Not at all	Somewhat	Moderately	Very much	Completely
0	1	2	3	4

- 3- How much do you feel your friends and loved ones like your nose?

Not at all	Somewhat	Moderately	Very much	Completely
0	1	2	3	4

- 4- Do you think your current nasal appearance limits your social or professional activities?

Always	Usually	Sometimes	Rarely	Never
0	1	2	3	4

- 5- How confident are you that your nasal appearance is the best that it can be?

Not at all	Somewhat	Moderately	Very much	Completely
0	1	2	3	4

- 6- Would you like to surgically alter the appearance or function of your nose?

Definitely	Most likely	Possibly	Probably not	No
0	1	2	3	4

Fig. (3): ROE. Each of the six items is scored on a 0-4 scale, with 0 representing the most negative response and 4 representing the most positive response. Dividing the total score for each instrument by 24 and multiplying by 100 yields the scaled instrument score. This range is 0-100, with 0 representing the least patient satisfaction and 100 representing the most patient satisfaction.



Fig. (4): A 30 year-old male patient complained of difficulty in breathing and was concerned about the shape of his nose. Our examination revealed that the patient had a depression in nasal dorsum after unsuccessful septoplasty operation. FL graft was placed horizontally over nasal dorsum to correct the deformity. (A) Pre-operative views. (B) Post-operative view.

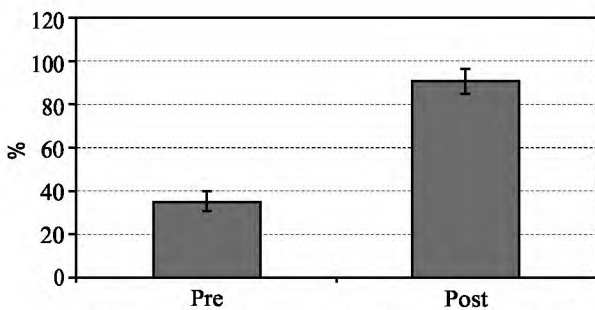


Fig. (5): Comparison of mean total score percentage for ROE before and after surgery.

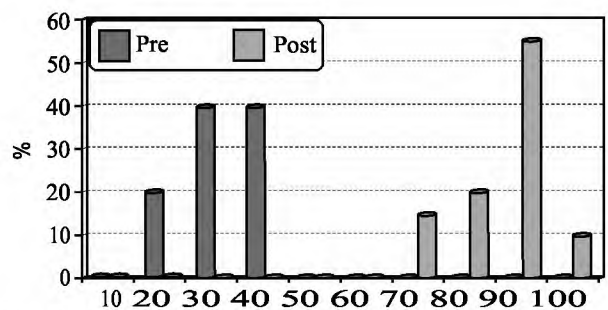


Fig. (6): Patients response to the VAS pre and post-operatively

Table (1): Comparison of mean total score percentage for ROE before and after surgery.

	ROE score		Paired <i>t</i> -test	
	Range	Mean ± SD	<i>t</i>	<i>P</i> -value
Pre	25.0-45.8	35.4±4.5	34.116	<0.001*
Post	70.8-100	90.8±5.7		

Table (2): Patients response to the VAS pre & post-operatively.

VAS (%)	Pre		Post		Total		Chi-square	
	N	%	N	%	N	%	χ^2	<i>P</i> -value
	10	0	0.0	0	0.0	0	0.0	40.000
20	4	20.0	0	0.0	4	10.0		
30	8	40.0	0	0.0	8	20.0		
40	8	40.0	0	0.0	8	20.0		
50	0	0.0	0	0.0	0	0.0		
60	0	0.0	0	0.0	0	0.0		
70	0	0.0	3	15.0	3	7.5		
80	0	0.0	4	20.0	4	10.0		
90	0	0.0	11	55.0	11	27.5		
100	0	0.0	2	10.0	2	5.0		
Total	20	100.0	20	100.0	40	100.0		

Table (3): Independent plastic surgeon evaluation on VAS pre & post-operative.

Independent plastic surgeon evaluation on VAS	Pre		Post		Total		Chi-square	
	N	%	N	%	N	%	χ^2	<i>P</i> -value
	10	1	5	0	0	1	2.5	120.000
20	6	30	0	0	6	15		
30	4	20	0	0	4	10		
40	9	45	0	0	9	22.5		
50	0	0	0	0	0	0		
60	0	0	3	15	3	7.5		
70	0	0	5	25	5	12.5		
80	0	0	6	30	6	15		
90	0	0	5	25	5	12.5		
100	0	0	1	5	1	2.5		
Total	20	100	20	100	40	100		

Discussion

The nose is one of the most important parts of the face aesthetically, drawing attention when it is either attractive or unattractive [7].

Many surgeons used pure cartilages to improve nasal dorsal irregularity and contour deformity. There were problems of palpable and visible contour of grafted cartilages. In addition, crushing cartilage in order to prevent these problems showed a maximum of 90% cartilage loss, depending on the crushing strength; therefore, unexpected irregularity and demarcation occurred in the long-term follow-up. To compensate for such disadvantages,

fascia lata is used. Contour deformities and lack of volume were also resolved via grafting by covering or overlapping the fascia lata in the areas of contour irregularity [8].

Fascia is frequently used in rhinoplasty, both in primary cases and in revision rhinoplasty cases. There are several reasons for using fascia in rhinoplasty: Fascia is resistant to infection, has a good survival rate, and is easy to shape yet strong enough to be sutured. The thickness of the fascia allows it to be sutured and to serve as the outer layer and container of diced cartilage [6].

Irregularities and adhesions to the underlying structures in the nasal dorsum may be seen after rhinoplasty surgery or nasal trauma. Dorsal irregularity is reported to occur in 7-10% of all primary rhinoplasties, requiring revision surgery. Thin skin is the major risk factor [13].

This study includes 20 patients who had dorsal irregularities underwent rhinoplasty using fascia lata graft. All patients filled translated Arabic form of ROE pre-operatively and 3 months post-operatively.

By analyzing demographic distribution of the study, 12 patients (60%) are males while 8 (40%) are females with age ranging from 18 to 43 years (mean age: 30.35) and most of them had previous history of facial trauma and males are still more liable to facial trauma than females and this also means that males do not care about the scar on the thigh post-operative than females.

Most of patients were middle aged with age ranging 25-30 years and they represented 40% of all patients and males and females were equally represented (4 males and 4 females). Patients in this age are showing maximal self-care with searching for their life partners. For patients more than 30 years, males are more represented than females (6 males and 3 females) and this may be due to higher liability to facial and casual trauma than females in that age and of the 20 patients, 12 underwent primary rhinoplasty while 8 patients were secondary cases.

Presence of skin edema might last 3 months potentially causes difficulty in assessment, and evaluation was therefore performed after 3 months in our study. Based on previous studies, there was no relationship between absorption and the number of layers of the graft used [9].

On the other hand, Karaaltin et al. reported the use of Fascia Lata (FL) graft for dorsal contouring

and camouflage in 63 patients who underwent rhinoplasty. There were 26 male and 37 female patients, with ages ranging from 18 to 43 years (mean age: 28.7). Of the 63 patients, 49 underwent primary rhinoplasty, while 14 were secondary cases. All patients showed satisfactory esthetic results and no apparent irregularities were observed over the nasal dorsum [10].

They concluded that fascia lata graft is a reliable, simple method for camouflaging any postoperative dorsal irregularities, particularly in patients with thin nasal skin [10].

In this study, Fascia Lata (FL) graft was used for dorsal contouring and camouflage in 20 patients. All patients had satisfactory aesthetic results, and no apparent irregularities were observed over the nasal dorsum. The questionnaire results showed that all patients were satisfied with surgery, and were not concerned about donor-site scar.

In the 2007 study by Ju Jang et al. [11], designed to investigate autoplast-processed fascia lata for nasal dorsal augmentation in rhinoplasty, 69 patients were followed by photographs for 12 months after surgery. In 41 patients, fascia lata without other material combination was used, and complete absorption occurred in 4.3% percent of this group.

Use of TPFL as a dorsal graft material has some drawbacks. First, there may be concerns about possible transmission of viral or prion diseases. However, no such reports have been published. Second, TPFL is expensive and not affordable for all patients. Last, and significantly, partial resorption of TPFL may occur because TPFL is regarded as a biological implant of human origin that acts as a spacer until replaced by the body's own tissue [12].

In this study, we used autogenous fascia lata graft that is not expensive, available, with no possible transmission of infection, the harvesting of the graft is easy and, for an experienced surgeon, the harvesting time may not exceed 10min. In addition, two surgeons may work simultaneously when the donor site is other than the head and neck region.

Finding the ideal tool for nasal evaluation is not easy. There is lack of a gold standard method because of subjective nature of nasal aesthetics and function [14].

The ROE was developed and validated by Al-sarraf [15]. He proved that ROE has a high test reliability (r 0.83), and validity (p 0.001). It is

mainly geared toward evaluation of aesthetic results following rhinoplasty through 6 questions (5 of them about shape of the nose and 1 about the breathing) [15].

In this study, all patients were followed-up over a mean period of 16 months, and results were satisfactory with no apparent irregularities over the nasal dorsum. The harvesting of the graft is easy and for an experienced surgeon, the harvesting time may not exceed 10min. In addition, two surgeons may work simultaneously when the donor site is other than the head and neck region. The questionnaires revealed that the patients were not concerned about region, and all of them exclusively preferred a good-looking nose at the expense of the scar.

Conclusion:

Final touches can be regarded as the most important steps to give the definition of the aesthetic lines in the nasal structure. This study shows that fascia lata graft is a reliable, simple method for camouflaging any postoperative dorsal irregularities.

Several methods and materials have been described for the final refinements in nose surgery, but still autografts remain the main resource and gold standard for nasal surgery. Because of its physical and biological characteristics, fascia lata graft can be considered as one of the good choices. Moreover, it may be considered as a perfect seal for covering the unwilling bias.

Conflicts of interest:

No conflicts of interest declared.

Authors' contributions:

All authors had equal role in design, work, statistical analysis and manuscript writing.

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دور رقعة اللفافة الفخذية في علاج عيوب ظاهر الأنف

تجميل الأنف واحدة من الإجراءات الجمالية في الوجه الأكثر تحدياً. تطورت عمليات تجميل الأنف على مدى سنوات عديدة ولكن إختيار مادة الرقعة لا يزال قابل للنقاش. عيوب ظاهر الأنف بعد عملية تجميل الأنف هي مزعجة لكل من المريض والجراح وهدف هذا الموضوع هو تقييم استخدام رقعة اللفافة الفخذية في علاج عيوب ظاهر الأنف سواء بمفردها أو إستخدامها مع الرقع الأخرى مثل الرقعة الغضروفية وغيرها وذلك لإخفاء عيوب ظاهر الأنف. وهذه الدراسة تم تنفيذها بقسم الأنف والأذن والحنجرة في مستشفى طنطا الجامعي على عشرين حالة متتابعة من حالات تجميل الأنف بإستخدام اللفافة الفخذية بداية من شهر أبريل ٢٠١٥ إلى سبتمبر ٢٠١٦ تم أخذ تاريخ مرضى مفصل لمرضى الدراسة وفحص أنف وأذن وحنجرة شامل وفحص عام كامل وفحوصات للتخدير الكلي وفحص أمامي للأنف. موافقة المريض للمشاركة في هذه الدراسة بإقرار تم التوقيع عليه. تم تقييم المريض قبل وبعد العملية بصورة جانبية وأمامية للوجه وتقييم أى عيوب في ظاهر الأنف بإستخدام تقييم مدرج من (١٠-٠) عن طريق المريض نفسه وجراح مستقل لا يعلم تفاصيل العملية مع الأخذ في الإعتبار خصوصية بيانات المريض. المرضى الذين يعانون من عيوب بسيطة في ظاهر الأنف هم المشاركون في البحث. المرضى أقل من ١٨ سنة أو الذين يحتاجون لعمليات كبرى لتجميل الأنف أو الذين يرفضون المشاركة لا يخضعون للدراسة. وتمت دراسة النتائج إحصائياً. تعتبر اللمسات النهائية في عملية تجميل الأنف أهم الخطوات لإعطاء جمالية في بنية الأنف وتبين هذه الدراسة أن رقعة اللفافة الفخذية طريقة بسيطة يمكن الإعتماد عليها لإخفاء أى عيوب بظاهر الأنف، وبخاصة في المرضى الذين يعانون من رقة جلد الأنف حيث تكون عيوب ظاهر الأنف واضحة في تلك المرضى وبخاصة مع الرقعة الغضروفية وتتميز اللفافة الفخذية بأنها سميكة وبالحجم الكبير وسهولة الحصول عليها وقد أظهرت هذه الدراسة تحسن ملحوظ في ظاهر الأنف للمرضى الذين أجريت لهم عملية تجميل الأنف بإستخدام رقعة اللفافة الفخذية.