Anatomically Based Optimization of Outcomes in Middle Eastern Rhinoplasry

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INTRODUCTION

People have different morphological features related to their ethnic differences, because of racial characteristics. The Middle East is rather a political than a geographical or ethnic division as it includes North African countries, Gulf countries, countries in Asia like Syria, Lebanon, Iraq, Jordan, Turkey, and Iran. The Egyptian nose is an example of the mixed ethnic nature as regards the anatomy and morphology of the nose. The predominant character in the Middle Eastern noses is the thick skin and weak cartilages if compared with the White noses. This fact undermines the aesthetic outcomes of rhinoplasty, especially when the common techniques are adopted without paying attention to inherent anatomic features. Many authors have made their contributions like defatting of the skin over the lower part of the nose, but this was followed by prolonged edema in the supra-tip area. Daniel stated that most secondary rhinoplasties are due to poor definition of the tip in addition to failure of correction of the original deformity and presence of visible surgical stigmata. Thick skin, weak cartilages, amorphous nasal structure, bulbous tip, and postoperative supra-tip swelling require technical endeavors to improve the outcomes of rhinoplasty in this category of patients. The author discusses some anatomical findings responsible for the stigmata of these noses and describe some technical modifications adopted to achieve better esthetic outcomes.

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Background: The predominant character in the Middle Eastern noses is the thick skin, weak cartilages, amorphous bulbous nasal tip, and high incidence of postoperative supra-tip swelling, compared with the Caucasian noses. The purpose of this study was to describe some anatomical findings and find techniques to improve outcomes in these patients.

Methods: This is retrospective study in 624 patients of Middle Eastern origin, where the characteristic anatomical findings are described and the surgical endeavors to combat their detrimental effect on the outcomes of rhinoplasty are explained.

Results: The results have shown that in these 624 patients, 365 patients had excellent results, 223 patients had average results, while 36 patients had poor results.

Conclusion: The nasal shape depends on the skin (skin barring) or the cartilages (cartilage barring), or both (skin and cartilage sharing). Middle Eastern patients are toward the skin barring category with the lateral crus of the lower lateral cartilage very broad with a lateral fibrous attachment replacing the minor (sesamoid) cartilages leading to ill definition of the alae from the sides of the nose. Outcomes in these patients were improved by identification and release of these lateral attachment to improve the bulbous tip and define the alar subunit from the side of the nose. Cephalic rotation is achieved mainly by M-shaped excision of the inner lining of the vestibule and the caudal part of the septum. Other methods described to combat the strong skin memory and allow skin to configure after surgery. (Plast Reconstr Surg Glob Open 2018;6:e1862; doi: 10.1097/GOX.0000000000001862; Published online 22 October 2018.)

PATIENTS AND METHODS

This is a retrospective study from 2003 to March 2016, the author has done rhinoplasties in 624 patients of Middle Eastern origin (584 Egyptian, 20 Saudi, 12 Kuwaiti, 4 Palestinians, 2 Algerians, 1 Jordanian, and 1 Moroccan).

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Anatomical Findings

In these patients, the author has identified 4 main anatomical findings with varying degrees of severity, which are peculiar to these kinds of noses.

1. The skin is very thick and sebaceous.
2. The cartilages are thin and weak with lesser contribution to the shape of the nose.
3. The lateral crus of the lower lateral cartilage is broad and saucer-like with a lateral fibrous attachment replacing the minor sesamoid cartilages of the lateral crus described in literature (Fig. 1).
4. There is a thick fibro-fatty layer between the skin and the lower lateral cartilage, which during dissection can come out easily with the lateral crus of the lower lateral cartilage, the thinner the cartilage the thicker this fibro-fatty layer.

All these factors lead to failure of distinction of the different parts of the nose, as the thick skin drapes heavily over the weak cartilaginous structures, so the tip becomes amorphous and bulbous and the middle vault is not narrow enough to distinguish the radix from the lower nose. Surgical creation of the dorsal aesthetic lines (Sheen lines) is needed to improve this deformity. The lateral attachment of the lateral crura of the lower lateral cartilages blurs the distinction between the nasal sidewall subunit and the alar lobule subunit externally, so identification and cutting these attachments instantaneously improves this problem.

Surgical Techniques

To overcome these anatomical variations, the author has used some surgical techniques in addition to the commonly used ones to achieve satisfactory aesthetic outcomes; these can be summarized as follows:

1. Open rhinoplasty without columellar incision (or Closed rhinoplasty with alar delivery): as described by Holmstrom.7
   
   This is done to avoid severing of the lymphatics and venous drainage of the skin of the tip to diminish postoperative edema and swelling which is more in thick skin than in thin skin and sometimes causes persistent tip swelling.

2. Identification and release of the lateral attachment of the lateral crus of the lower lateral cartilage: (Supplemental Digital Content 1, http://links.lww.com/PRSOG/A832).
   
   This lateral fibrous band spans between the lateral part of the lower lateral cartilage and the subcutaneous tissues at the nasolabial line. Cutting this band releases lateral tension on the lower lateral cartilage and helps to narrow the tip after doing the interdomal sutures.

3. Reduction of broad lateral crus of the lower lateral cartilages by lateral, cephalic, and caudal resection:
   
   This is done to reduce the size of the lateral crus contrary to White rhinoplasty where cephalic resection of the lateral crus is sufficient to refine and cephalically rotate the tip.

4. Cephalic rotation is achieved mainly by M-shaped excision of the inner lining of the vestibule and the caudal part of the septum: (Fig. 2):
   
   This is usually done by incision of about 2–4 mm of the inner surface of the vestibules at the upper edge of the rim incision. Then by cephalic advancement of the lower edge and suturing the tip will be advanced cephalically and the nose will be shortened.

5. Creation of the dorsal aesthetic lines of the nose (Sheen lines):

Fig. 1. Shows the broad saucer-like lateral crus of the lower lateral cartilage and the lateral fibrous ligament replacing the sesamoid cartilages.

Fig. 2. Shows the 2 limbs of the M-shaped excision from the skin of the nasal vestibule in addition to the caudal resection of the septum to achieve cephalic rotation of the tip.
This is usually done by designing the dorsal and lateral osteotomy and subcutaneous tissue reduction and placement of dorsal graft to exaggerate the dorsal lines.

6- The tip transfixion stitch: (Fig. 3)
In extremely thick skin a transfixion stitch with a prolene 3/0 on straight needle is inserted in the caudal ends of sheen line to define the tip in patients with amorphous tip, this helps to overcome the strong skin memory at the tip and force the skin to redrape over the modified cartilages and prevent the dead space between the skin and the operated cartilaginous frame work of the tip, which allows edema to develop and later on replaced by fibrous tissue leading to the supra-tip postoperative swelling. This stitch is usually removed within 2 weeks.

RESULTS

Anatomical Findings
The predominant feature of thick skin and weak cartilage is loss of distinction of different nasal esthetic subunits. In minority of cases, we have found thick skin and thick cartilages (6 cases). From above, we can realize that the nasal

Fig. 3. A, Preoperative frontal view of case with mild degree of thick skin. B, Postoperative frontal view shows the transfixion stitch effect on defying the thick skin and refining the tip. C, Preoperative lateral view shows the dorsal hump. D, Postoperative lateral view shows the transfixion stitch and correction of dorsal hump with cephalic rotation of the tip.
shape is either dependent on the skin (skin barring) or the cartilages (cartilage Barring), if one is thick the other is thin, or uncommonly both are moderate in thickness (skin and cartilage sharing). The fibrous lateral attachment between the lateral crus of the lower lateral cartilage is present in almost all patients, where it replaces the minor sesamoid cartilages and causing failure of distinction of the lobule of the nose and the sidewalls. The lower lateral cartilages are extremely wide in these patients, with its width from 5 to 12mm and concave (saucer – like).

Fig. 4. A, Preoperative frontal view for patient with mild degree thick skin. B, Postoperative frontal view of the patient. C, Preoperative lateral view show the degree of dorsal hump. D, Postoperative lateral view.
Cosmetic Outcome

The cosmetic outcomes were measured by assessment of photographs in the standard views of rhinoplasty (the front, lateral, oblique lateral, and the occlusal view) by 2 plastic surgeons other than the author. The follow-up period ranged from 2 years to 13 years, and those patients with longer follow-up were coming for revision surgery or for other cosmetic surgery or with a friend who was seeking medical advice from the main author. They were asked to address the improvement as regard to:

1- The distinction of different parts of the nose.
2- The degree of recognition of the dorsal nasal aesthetic (Sheen) lines.
3- The degree of tip refinement. 
4- The cephalic rotation of the tip and nasal length. 
5- The total impression on the cosmetic outcome.

Assessors were asked to give a score out of 3, where 1 is poor result, 2 is average, and 3 is excellent result; depending on their impression on the above-named criteria and the mean is recorded for each patient. From the 624 patients in the study, 365 were of excellent results, 223 were of average results, and 36 were of poor results. Complications in the form of revision of rhinoplasty for supra-tip swelling by debulking of subcutaneous tissues (3 cases), nasal deviation (2 cases), internal valve obstruction (1 case with previous rhinoplasty done before by other surgeon), alar asymmetry after alar resection (1 case). No other complications have been recorded.

The degree of stigmata of the middle eastern noses varies from mild, moderate, or severe, example of mild cases is, moderate cases is and severe cases is (Figs. 4–6).

DISCUSSION

The term “middle eastern nose” is not as descriptive as the White, mongoloid, or Negroid noses, because of the multiple ethnicities of this region and diversity of its land extending from Africa to Asia and due to the dynamic impact of migration, invasion, and proximity by these territories. Nevertheless, there are traceable patterns such as thick sebaceous skin and weak cartilages in the majority of patients coming for rhinoplasty resulting in equivocal outcomes. Many authors had addressed this problem with excellent technical solutions and good results (1:6). The author has encountered nasal patterns differ in their severity than most of the published photographs and searched for methods to improve the outcomes. Thick skin has greater memory than thin skin, so it does not redrape easily over the modified osteo-cartilagenous nasal framework, and it retains the edema fluid longer than the thin skin resulting in less improvement than what is expected. Also, the lower lateral cartilage is wider than what is classically described in literature ranging from 5 to 12 mm, and usually it is concave like a saucer causing the tip to be bulbous. In almost all cases a lateral fibrous band was seen attached to the lateral crus and replacing the sesamoid cartilages and looks like a rudimentary muscle, which upon identification and cutting improves the distinction of the alar subunit from the sidewall of the nose. Nasal tip improvement has been achieved satisfactorily by trimming of the lateral, caudal, and cephalic parts of the lateral crus with inter-domal sutures. Columellar struts are used to define the dropped and bulbous tips in about 30% of cases, and it might have greater role in middle eastern rhinoplasty than in White rhinoplasty.8,9 The transfixion stitch as de-
scribed above, is needed in about 20% of cases to define the amorphous tip and forces the unyielding thick skin to collapse and obliterates the dead space preventing edema collection and later fibrosis.

Cephalic rotation of the tip and nasal shortening is achieved in extremely thick skin by M-shaped excision of a measurable strip of skin from the nasal vestibule in addition to common procedures known for this purpose. Most of the patients with poor outcomes are those with more severe forms of thicker skin and weaker cartilages and amorphous nose, they were told preoperatively about these inferior results and that surgery will be more nasal volume reduction rather than refinement surgery and they agreed about that. Thick skin has only one advantage in rhinoplasty, which is being permissible for fine irregularities in the dorsal framework.

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Fig. 6. A, Preoperative frontal view for patient with severe degree of thick skin and ill-defined nasal tip. B, Postoperative outcome.