Rhinoplasty: The African American Patient

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ABSTRACT

Over the past three decades, an increasing number of African American patients have undergone rhinoplasty, and many continue to present to surgeons for rhinoplasty evaluation. The reality is that rhinoplasty is no longer an uncommon procedure in the African American population. Most patients desire nasal refinement while preserving their cultural identity. The African American nose has many unique features that have to be appreciated and understood to provide the desired outcome. In this paper, we present an overview of the unique anatomic features of the African American nose, rhinoplasty techniques tailored to this patient population, and complications encountered postoperatively.

KEYWORDS: Rhinoplasty, African American rhinoplasty, ethnic rhinoplasty

ANATOMY

Morphology

Understanding the nuances of the nasal anatomy of the African American patient is critical in the evaluation, diagnosis, and selection of rhinoplasty interventions in this specific patient population. Multiple studies and reports in the literature document unique features of the anatomic components of the African American nose.¹⁻³ When compared with the leptorrhine nose, the platyrrhine nose has been described to have a flat, wide, and depressed dorsum, less defined tip, alar flaring, short columella with an acute columellar-labial angle, decreased nasal length/height, and low radix, with thick, sebaceous skin^{2,3} (Figs. 1 and 2).

There is, however, significant variation within the African American population, and the description by Ofodile et al⁴ of "the black American nose" highlights this fact, dividing patients into three groups based on a historically diverse ethnic heritage. In his classification, the African nose (group A) is short with a wide, low/

concave dorsum, less defined tip with decreased projection, has a short columella, with a wide and flared alae. The Afro-Caucasian nose (group B), in contrast, as the name implies, appears more leptorrhine with a longer nose, high/narrow and straight dorsum, better tip definition, and less flared alae. The Afro-Indian nose (group C) represents the third group and is longer and larger, with a high, wide dorsum associated with a dorsal irregularity. The alae in these patients are flared and the tips are less defined, but with more projection than is seen in the African nose.

Structure

Considering the structural components of the nose, differences have been noted in the skeletal and cartilaginous framework of the nose in patients of African American descent when compared with that of other ethnic groups.

A study of the nasal bones and pyriform apertures of cadaver skulls with anthropometric measurements

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Figure 1 Preoperative photograph illustrating a wide, depressed nasal dorsum, wide alar base, short columella, bulbous tip, and poor tip projection.

reported by Ofodile⁵ in 1994 again showed evidence of the triethnic heritage of the African American patient. Skulls from the West African Ashanti tribe studied had nasal bones that were short, narrow, and thick when compared with American Indian and Caucasian skulls. Similar measurements in the African American skulls were found to fall between the West African and Caucasian/Indian American groups. The shape of the pyriform aperture in the African American skulls varied from oval to triangular, again falling between the Ashanti and Caucasian/Indian American groups, which had apertures that were oval and triangular. In addition to these findings, as has been reported by others,^{6,7} the nasal bones in the skulls of African origin had an obtuse angular relationship to each other at the nasal dorsum. The clinical significance of these findings is that attempts to improve dorsal apex projection are better achieved by dorsal augmentation as opposed to osteotomy and infracture.^{5,7}

Alar cartilage in African American patients, extrapolated from cadaver studies,³ also appears to show some variation along the previously mentioned triethnic lines; variations were primarily seen in the range of anteroposterior alar cartilage width. Cadavers with the African type nose had narrower alar cartilage compared with the Afro-Indian and Afro-Caucasian type noses. Any form of cephalic alar excision in these patients with

narrow alar cartilage should be approached with caution given the risk for alar collapse. On average, though, the height and width of the lower lateral crura in African American patients were found to be similar to dimensions found in Caucasian patients. The distance from the lower margin of the alar cartilage to the nostril rim was also found to be similar in both African American and Caucasian patients. Differences between African American and Caucasian patients at the level of the alar cartilage can be attributed to the angle of inclination of the alar cartilage relative to the plane of the maxilla. Morphologically, in African American patients with a more acute cartilage angle of inclination, the nasal base appears widened and the nose has less tip projection. Flaring of the alae and the bulbous tip in addition contribute to a distinctly different appearing nose when compared with the Caucasian nose.

These anatomic differences, even within the African American population, emphasize the importance of an individualized approach to rhinoplasty using sound principles.

PATIENT'S DESIRES AND GOALS OF RHINOPLASTY

As a general rule, African American patients considering rhinoplasty desire some form of nasal refinement without

Figure 2 Preoperative photograph illustrating a wide nasal dorsum, alar flaring, bulbous tip, and good tip projection.

loss of their ethnic identity. The term *nasal refinement* is preferred, as it refers to operative changes made to approach appearances that are often seen in the leptorhine nose. Patients may wish to address specific features such as alar flare, tip definition, dorsal irregularities, and decreased tip projection.

The surgeon has the challenge of formulating an operative plan that optimally addresses these patient desires. It cannot be overstated that the overarching goal of rhinoplasty in the African American patient, as it is in all non-Caucasian patients, is to make changes in the nose that produce refinement while preserving ethnic features and harmony with the rest of the face. Achieving this goal hinges upon an understanding of the nasal anatomy of the African American patient as well as the critical differences that affect the operative technique of choice.

Rohrich and Muzaffar² succinctly summarize five goals in African American rhinoplasty as follows: maintaining nasal-facial harmony and balance; a narrower, straight dorsum; enhanced tip projection and definition; slight alar flaring; and narrower interalar distance.

RHINOPLASTY TECHNIQUES

The choice of open versus endonasal rhinoplasty techniques is largely surgeon dependent. Some of the recent literature on rhinoplasty in African American patients favors the use of the open technique,^{2,8} likely due to the advantage of direct visualization it affords the surgeon. Breaking the procedure into components based on the anatomic nasal components being addressed, multiple techniques have been shown to be effective.

Alar Base

Three subtypes of the alar base in African American patients have been described^{2,9}: (1) Increased base width with lateral positioning of the alar base relative to the medial canthus, (2) alar flare, and (3) a combination of the previous two variants. Alar flaring greater than 2 mm lateral to the medial canthi² can be addressed by alar base resection (Fig. 3). Interalar distance is improved by nostril sill resection and advancement² (Fig. 4). Narrowing the alar base should be tempered with preservation of the external nasal valve aperture.

Nasal Tip Definition

As previously described, the African American nose is characterized by a less defined tip with decreased projection. Tip bulbosity is likely secondary to soft, divergent middle crura and the thick overlying skin. The thick, sebaceous skin that drapes over the skeletal framework of the African American nose can be addressed with several techniques. In our hands, careful excision of

Figure 3 Alar base resection for flaring greater than 2 mm lateral to the medial canthi.

Figure 4 Nostril sill resection and medial advancement for wide interalar distance.

excess fibro-fatty tissue in the nasal tip provides some improvement; this should be approached with caution given the risk for tip necrosis with excessive debulking.

Established maneuvers to increase tip definition in the non-ethnic patient can easily be translated into

the African American nose with good results. Techniques to improve this appearance include excision and augmentation maneuvers that help accentuate the nasal tip. Cartilage excision, such as the cephalic trim, should be done in a very conservative manner. In the African American nose, these techniques are simply to facilitate rotation and shaping of the lower lateral cartilages; overly aggressive cartilage resection will lead to decreased tip support and ultimately a loss of projection.

Tip sutures and cartilage grafts are the mainstay of increasing tip definition and projection in these patients. *Transdomal sutures*, a term coined by Tardy and Cheng,¹⁰ but in its current form described by Daniel,¹¹ involves the placement of permanent horizontal mattress sutures through the two crura of each dome (Fig. 5). The use of transdomal sutures helps improve tip definition by creating a more acute angle between the medial and lateral crura of the lower lateral cartilages. Additional strategic placement of alar sutures in the form of interdomal and intercrural sutures further aid in enhancing tip projection. The interdomal suture is placed from the anteromedial portion of one dome to the adjacent dome in a simple looped or figure-of-eight fashion (Fig. 6). This ultimately results in approximation of the domes, narrowing of the tip, and lengthening of the lobule.¹² Intercrural sutures broadly describes medial and middle crural sutures placed in specific segments of the medial crura. The medial crura suture is a looped suture placed in the middle third of the medial crura (Fig. 7). This results in a narrowing and strengthening of the columella and augmentation of lobular volume and length.¹² The middle crura suture is a simple looped suture placed through the most anterior portion of the medial crura (Fig. 8). This suture compared with the medial crura suture produces greater reduction of the interdomal distance and increased lobule volume and protrusion.¹² The medial and middle crura sutures are typically used in combination with columella struts to provide better tip support; given the limited availability of septal cartilage grafts, alternate graft options including costal cartilage and irradiated rib grafts should be considered.

Additional tip refinement can be achieved by augmentation, many recommending the use of autologous cartilage tip grafts.^{9,13–15} Grafts for tip refinement can be placed through the open approach as onlays sutured onto existing cartilage or into subcutaneous pockets through the endonasal approach. Tip onlay grafts (Fig. 9), described by Peck¹³ in 1983, increase tip projection, lobule length, and enhance tip definition. In a similar fashion, infratip lobular grafts (Fig. 10), described by Sheen¹⁴ in 1975, increase tip projection and volume. In a recent article, Guyuron and Jackowe¹⁵ describe a modification of the onlay and shield graft techniques with the use of a novel graft punch device

Figure 5 Transdomal suture; narrows the nasal tip.

that provides the advantage of precise, rapid sculpting of the cartilage used for augmentation.

Tip Projection

A small nasal spine and short, rounded columella have been cited as reasons for the decreased nasal tip projection noted in African American patients. Techniques previously discussed for tip definition in the form of alar sutures and nasal tip cartilage grafts also improve tip projection to varying degrees.

A keystone to improving nasal projection are structural cartilage grafts that provide needed support to the nasal tip. With the septal extension graft (Fig. 11) or the columellar strut graft (Fig. 12), the rhinoplasty

surgeon can adequately address tip projection in this patient population. The columellar strut graft is a popular method for increasing and maintaining tip projection. Placed between the footplates of the medial crurae, these grafts may be sutured in place with medial crural sutures, fixed to the nasal spine, or left free-floating.

Dorsal Projection/Nasal Bridge

A review of the literature shows a lack of consensus on the value of the lateral osteotomy in the face of a wide nasal bridge with decreased dorsal projection as is seen in many African American noses^{2,16,17} A significant concern is for the risk of excessively narrowing the dorsum relative to the nasal lobule, producing some racial incongruity.¹⁷

Figure 6 Interdomal suture.

Figure 7 Medial crura suture, placed in middle third of medial crura.

Figure 8 Middle crura suture, placed in anterior third of medial crura.

To avoid this incongruity, Rohrich and Muzaffar² recommend making the infracture proportional to the lobule size, in addition to interalar width reduction and tip refinement. Dorsal augmentation alone without osteotomies has been advocated by others^{5,9,16,17} who have shown good, reproducible results with this technique. Augmenting the nasal dorsum gives an illusion of narrowing the nasal bridge¹⁸ (Figs. 13 and 14). Augmentation materials range from autologous tissue in the form of units of cartilage and bone to alloplastic materials such as

Figure 10 Infratip lobule graft.

Gore-Tex (ePTFE; W.L. Gore & Associates, Flagstaff, AZ), silicone, and AlloDerm (LifeCell Corp., Branchburg, NJ). Potential problems of warping, visibility, long-term survival, and the limited availability of cartilage grafts have been overcome by the increasing application of diced cartilage grafts in rhinoplasty. Optimizing the long-term viability of the diced cartilage by wrapping it in Surgicel¹⁹ (Johnson & Johnson, Somerville, NJ) or temporal fascia²⁰ is still the subject of debate.

Figure 9 Cartilage tip onlay graft.

Figure 11 Septal extension graft.

Figure 12 Columella strut graft; improves tip projection and provides support.

COMPLICATIONS

Scarring and Keloid Formation

Keloid formation and hypertrophic scarring are always concerns when performing surgical procedures on African American patients. However this is a seldom encountered complication in African American rhinoplasty patients.^{2,17} In spite of this, preventative measures such as tension-free closure of incisions and the use of fine permanent sutures should always be employed.

Prolonged Edema

Postoperative edema has been reported to last as long as 12 to 18 months.¹⁷ This is likely due to lymphatic obstruction from multiple incisions and the thick, sebaceous skin covering of the nose. Meticulous intraoperative hemostasis, extended postoperative splinting, and the use of steroids have been advocated to help improve the edema.² Patients need to be informed of this sequela preoperatively in order that they are mentally prepared in the event of its occurrence postoperatively.

Asymmetry

Asymmetry of the alar base is most commonly noted postoperatively and is largely due to asymmetric or excessive resection of the alar base. This problem is best noted intraoperatively at which time appropriate measures can be taken to correct the asymmetry. Asymmetry can be prevented by carefully performing measurements with a caliper and assessing preoperative photographs to aid in a precise determination of the amount of tissue to be resected. In cases where asymmetries are noted postoperatively, correction should only be performed 10 to 12 months later, after the edema has resolved.

Tip Necrosis

The soft tissue envelope of the African American nasal tip is thick and sebaceous in nature, contributing to nasal tip definition. Debulking of the skin fibro-fatty tissue in an attempt to provide better definition could lead to skin vascular compromise with resulting nasal tip skin necrosis. Vascular compromise at the nasal tip can also result with excessive tension placed on the skin as a result of increasing the tip projection. Conservative debulking and grossly assessing the nasal tip skin perfusion

Figure 13 Intraoperative view of use of cartilage grafts for dorsal augmentation and tip projection with a columella strut.

Figure 14 Preoperative and postoperative photographs after dorsal augmentation, columella strut placement, and alar base resection.

intraoperatively can help prevent this complication. Alternatively, debulking can be performed as a second-stage procedure allowing for the nasal tip skin to recover from stresses introduced in the initial rhinoplasty procedure. The best way to prevent this complication is to completely avoid skin debulking and rely on grafting/suture techniques to enhance tip definition.

Racial Incongruity

This complication arises from nasal bone infracture resulting in a disproportionate narrowing of the nasal dorsum relative to the lobule. Matory and Falces¹⁷ report this complication in four patients (4 of 134 non-Caucasian patients) who underwent infracture and alar base resection. They found that alar base resection does not

decrease the alar or lobule width significantly. Recommendations^{2,17} to avoid this complication include (1) adjusting the infracture to be proportional to the lobule, (2) performing simultaneous or subsequent alar base or interalar reduction, and (3) use of a columellar strut and cartilaginous tip graft at the time of infracture improving on alar width and flaring.

CONCLUSION

The approach to rhinoplasty in the African American patient should be based on an appreciation of the subtle nasal variations encountered within this population. The subdivision of patients into three groups, African, Afro-Caucasian, and Afro-Indian, based on nasal anatomic and morphologic features is a key step in understanding and categorizing the features presented. Well-established rhinoplasty techniques ranging from dorsal augmentation to tip refinement with cartilage suture techniques have been shown to be effective in African Americans.

Preserving the ethnicity of the African American patient while making calculated rhinoplastic changes is key to achieving successful outcomes.

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