

# Nasal Analysis: Considerations for Ethnic Variation

Nathaniel L. Villanueva, M.D.  
Paul N. Afrooz, M.D.  
Jourdan A. Carboy, B.S.  
Rod J. Rohrich, M.D.

Dallas, Texas



**Summary:** As the United States continues to be more ethnically and racially diverse, it is important for the rhinoplasty surgeon to have an appreciation and understanding of nasal variations that exist to plan for and execute ethnically congruent results. The nasal analysis is a critical component of the patient evaluation, which has been used as a tool by surgeons to identify deviations from anatomical norms or canons. In this article, the authors describe common nasal anatomical variations that exist between ethnic groups as a guide for nasal analysis. Understanding these variations will facilitate and help define important cultural aesthetics, which can be used to plan for rhinoplasties in a diverse patient population. (*Plast. Reconstr. Surg.* 143: 1179e, 2019.)

The United States is continually becoming more ethnically and racially diverse.<sup>1</sup> As such, the diversity of patients presenting for rhinoplasty has followed and will likely continue to follow these population trends.<sup>2</sup> It is important for the rhinoplasty surgeon to have an appreciation for and understanding of the racial and ethnic variations that exist. Furthermore, the concepts of aesthetic ideals must be understood when evaluating such a diverse patient population. Before performing a rhinoplasty, the surgeon must accurately assess and evaluate the patient's nose and clearly define the patient's concerns and goals. The nasal analysis is a critical component of the patient evaluation, which has been used as a tool by surgeons to identify deviations from anatomical norms or canons.<sup>3-7</sup> The majority of the ideals described in the literature are based on the aesthetic ideals of a Caucasian nose, which has been identified as patients of Northern European descent.<sup>3-12</sup> However, applying these principles universally to patients with diverse racial and ethnic backgrounds can lead to incongruence in facial aesthetics. The rhinoplasty surgeon has the critical role of evaluating each patient's nose individually, defining problematic areas, and must keep in mind the anatomical variations that allow that patient to identify with their ethnicity. In addition, it is important to note that a large amount of

variation exists within each individual ethnicity, and many patients also identify with more than one ethnic group. Therefore, identification of ethnicity-specific norms should only be used as a tool to understand diverse anatomical variation, and the surgeon should recognize that no universal parameter can define ideal aesthetics across cultures or ethnic backgrounds.<sup>4</sup> In this article, we describe common nasal anatomical variations that exist between ethnic groups as a guide for nasal analysis. Understanding these variations will facilitate defining important cultural aesthetics, which can be used to deliver ethnically congruent rhinoplasty results.

## NASOFACIAL ANALYSIS

Thorough nasofacial analysis is key to achieving facial harmony in rhinoplasty. The facial

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From the Department of Plastic Surgery, University of Texas Southwestern Medical Center; and the Dallas Plastic Surgery Institute.

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analysis is performed during preoperative planning, on the frontal and lateral views, before performing nasal analysis. On the frontal view, facial symmetry is assessed through evaluation of facial height, width, and nasal and chin deviation. On the lateral view, facial height and proportions are evaluated. Then, systematic nasal analysis is performed to identify deformities, evaluate anatomical relationships, and establish goals for surgery. The nasal analysis on frontal, lateral, and basal views should be performed in a systematic fashion as described previously (Table 1).<sup>8,10</sup>

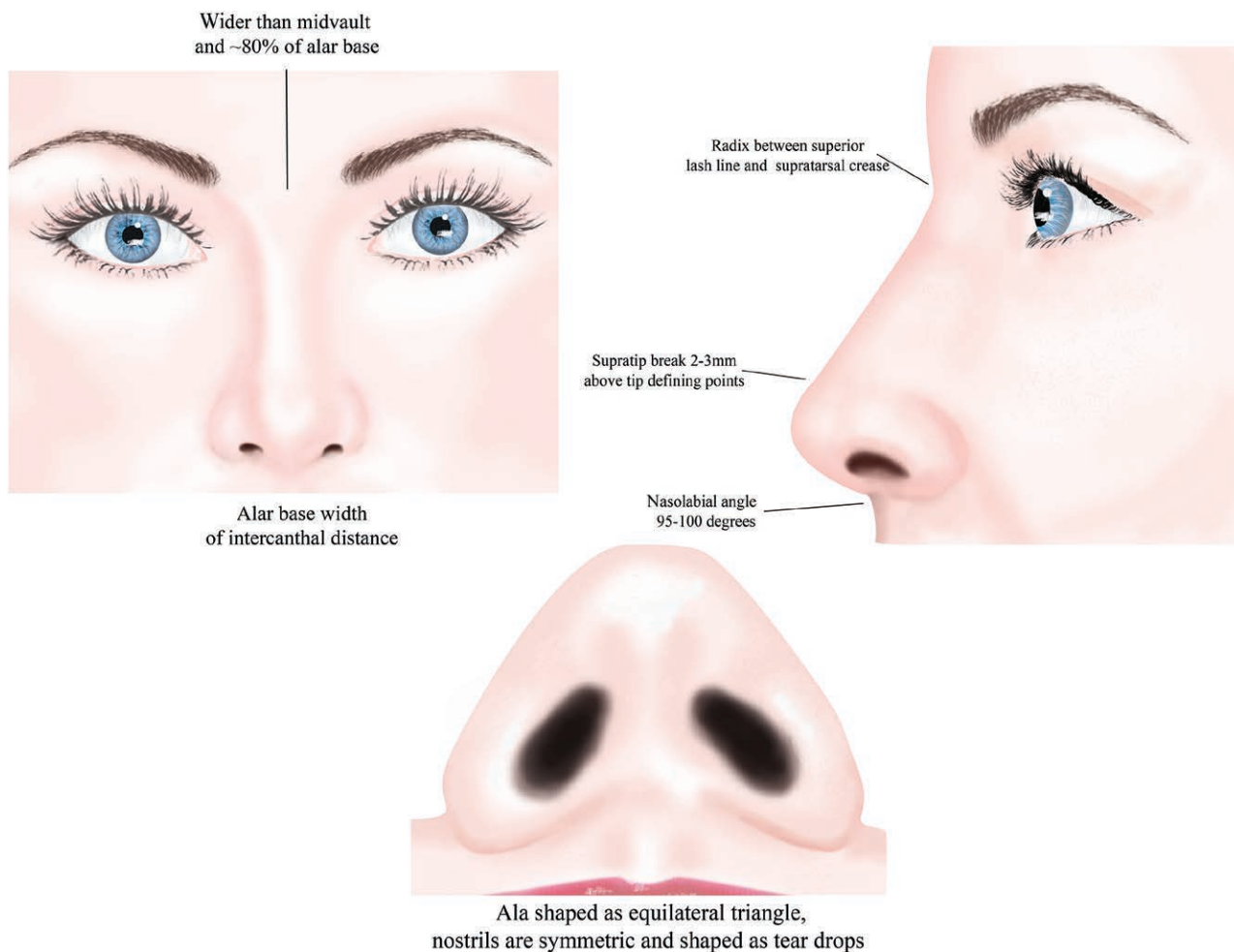
### CAUCASIAN NOSE

The ideal aesthetics of the Caucasian nose have been described extensively.<sup>3-13</sup> For the purposes of this discussion, the Caucasian patients are defined as having Fitzpatrick skin type of 1 through 3 and being of European descent. The facial proportions are characterized by equally spaced vertical fifths and horizontal thirds. The Caucasian nose usually has thin skin, although this is variable depending on sebaceous characteristics. On the frontal view, the nose should measure approximately two-thirds of the midfacial height, which is defined as the distance from the soft-tissue glabella to the alar base plane (Fig. 1, *above, left*).<sup>7</sup> The dorsal aesthetic lines diverge symmetrically from the medial brow to the nasal tip-defining points. The bony vault should be

slightly wider than the midvault and equal approximately 80 percent of the normal alar base. The base width of the nose at the alar bases should equal the intercanthal distance or the length of the palpebral fissure.<sup>3</sup> The tip-defining points are symmetric and create equilateral triangles when lines are drawn to the supratip break and columellar lobular angle. The alar rims should be symmetric and their shape should resemble a gull in flight. On the lateral view, the nasofrontal angle (radix) should lie between the superior lash line and the supratarsal crease, 15 mm anterior to the medial canthus, and should measure 120 to 130 degrees in men and 115 to 125 degrees in women (Fig. 1, *above, right*). The dorsum should be smooth, with a slight supratip break in women roughly 2 to 3 mm above the tip-defining points. Tip projection is assessed and should be two-thirds the ideal nasal length. Tip rotation is determined by the nasolabial angle and should equal approximately 90 to 95 degrees in men and 95 to 100 degrees in women. In the alar-columellar relationship, the nostril should create an oval, which is bisected when a line is drawn through the long axis of the nostril. The most anterior point of the chin should be at or slightly behind a vertical line drawn from the most anterior portion of the lower lip. On basal view, the nose should create an equilateral triangle (Fig. 1, *below*). The tip-to-columella ratio should equal 1:2. The nostrils should be symmetric and have a teardrop shape.

**Table 1. Systematic Nasofacial Analysis**

View	Characteristics
Frontal	
Facial proportions	Width (fifths), height (thirds), symmetry (symmetric or asymmetric), and chin deviation
Skin type/quality	Fitzpatrick type, thin or thick, sebaceous
Symmetry and nasal deviation	Midline, C- or reverse C-, or S- or s-shaped deviation
Bony vault	Narrow or wide, asymmetric, short or long nasal bones
Midvault	Narrow or wide, collapse, inverted-V deformity
Dorsal aesthetic lines	Straight, symmetric or asymmetric, well- or ill-defined, narrow or wide
Nasal tip	Ideal/bulbous/boxy/pinched, supratip, tip-defining points, infratip lobule
Alar rims	Gull-shaped, facets, notching, retraction
Alar base	Width
Lateral	
Nasofrontal angle	Acute or obtuse, high or low, radix
Nasal length	Long or short
Dorsum	Smooth, hump, scooped out
Supratip	Break, fullness, pollybeak
Tip projection	Overprojected or underprojected
Tip rotation	Overrotated or underrotated
Alar-columellar relationship	Hanging or retracted ala, hanging or retracted columella
Periapical hypoplasia	Maxillary or soft-tissue deficiency
Lip-chin relationship	Normal, deficient
Basal	
Nasal projection	Overprojected or underprojected, columellar-to-lobular ratio
Nostril	Symmetric or asymmetric, long or short
Columella	Septal tilt, flaring of medial crura
Alar base	Width
Alar flaring	



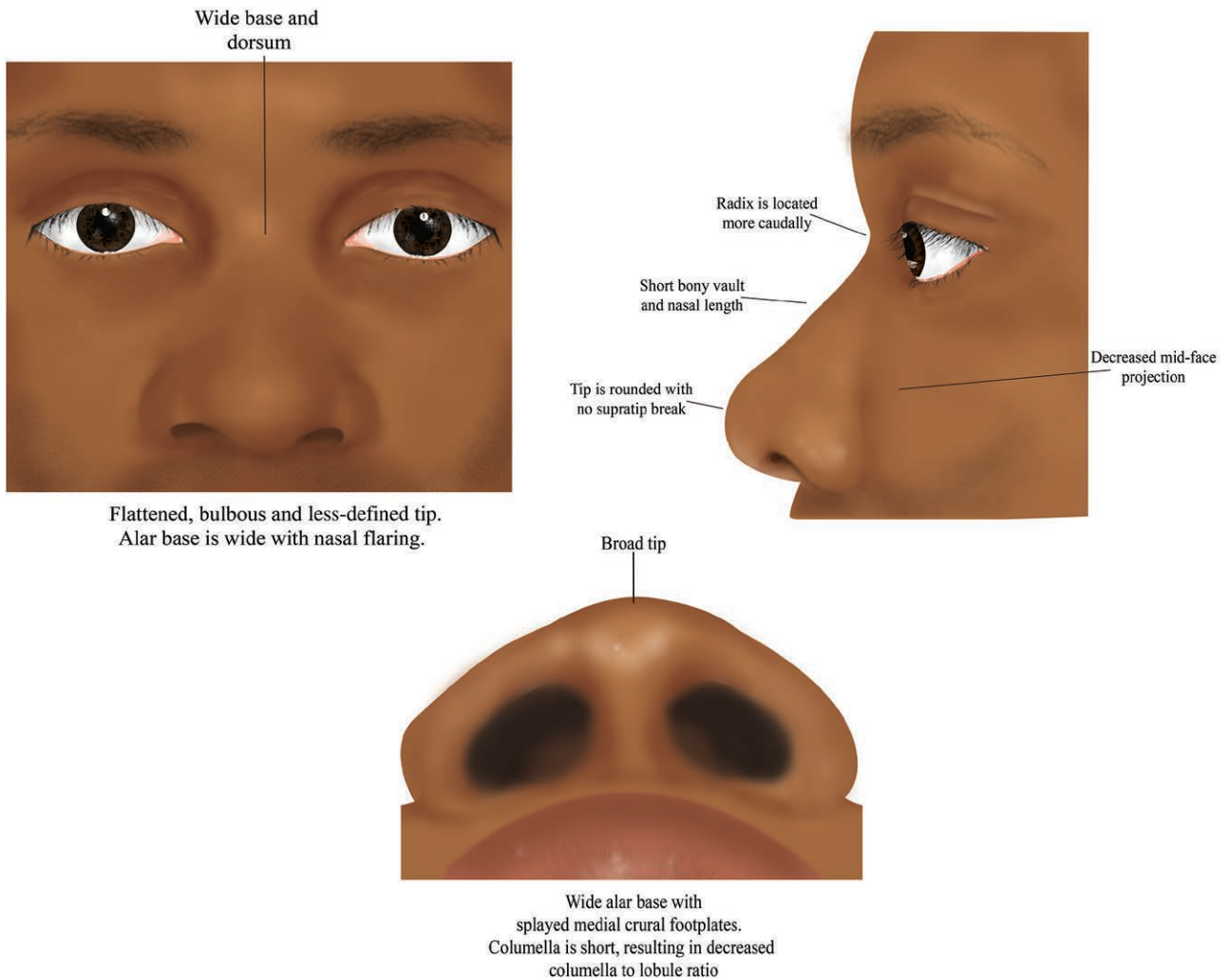
**Fig. 1.** Caucasian nose.

### AFRICAN AMERICAN NOSE

During the analysis of an African American patient, it is important to understand that there is no “typical” African American nose because of racial mixing and regional ethnic variation.<sup>14</sup> For clarification, the term African American is used to describe black Americans of African descent. Three types of African American noses have been elegantly described to identify intraracial differences, which include the African, the African Caucasian, and the African Indian noses.<sup>15</sup> Understanding that there are ethnic variations within this patient population, as with all other ethnicities, is essential in maintaining ethnic congruency. Harmony and symmetry should be the primary objective to any surgical plan, and understanding how the patient’s anatomy is disharmonious or asymmetric is critical to the nasal analysis. In general, the facial proportions of the African American patient do not follow the equally proportioned facial thirds and fifths of

the Caucasian population; instead, the middle fifth or intercanthal width is wider than the palpebral fissure length, and the horizontal middle third or midface has a shorter height than the equally proportioned upper and lower thirds of the face.<sup>16,17</sup> Typically, bimaxillary protrusion also exists.

When performing the nasal analysis on the African American patient, there are many common variations from the Caucasian nose that must be considered.<sup>2,8,14–21</sup> The African American nose tends to have thicker sebaceous skin. On frontal view, the nose has a wide base and dorsum (Fig. 2, *above, left*). The dorsal aesthetic lines diverge to a relatively flatter, more bulbous tip that is comparatively less sharply defined. The bony vault is short, as is the nasal length. The alar bases are wide, with an associated increase in alar flaring. On lateral view, the radix is less projected and located more caudally (Fig. 2, *above, right*). The nasofrontal angle is often more obtuse



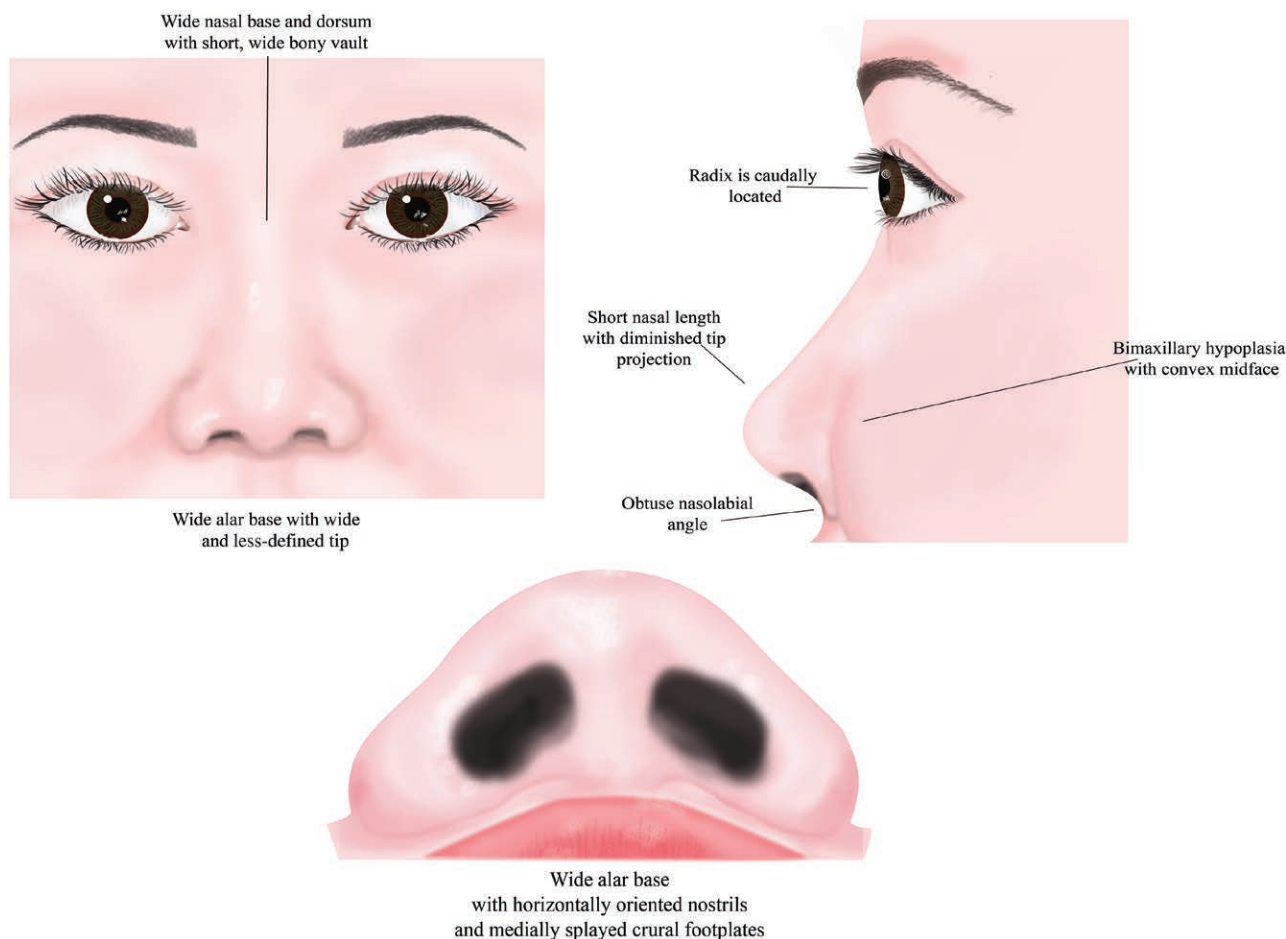
**Fig. 2.** African American nose.

(>130 degrees). The dorsum tends to be low and concave, with minimal or no dorsal hump. However, it is important to note that the African Indian nose is associated with a high radix and a dorsal hump.<sup>15</sup> The nose is short with decreased projection, which is typically 0.5 to 0.6 times the nasal length. The tip is rounded, with minimal to no supratip break. The nasolabial angle is acute, and the lips tend to be more prominent. The columella may also be retracted. Many African American patients have microgenia and decreased midface projection, which is also noted on lateral view. On basal view, there is a decreased columella-to-lobule ratio because of a shortened columella (Fig. 2, *below*). The tip is broad, with a wide alar base. There is increased variability in nasal base shape and axis of nostril orientation that includes three described variations: trapezoidal with inverted nostril axis, oval with horizontal nostril axis, and triangular with vertical nostril

axis.<sup>21</sup> In addition, alar base abnormalities can be defined as increased interalar distance, with the alar bases being lateral to the medial canthal line, excessive alar flaring with the a portion of the ala extending lateral to the alar attachment of the cheek, and a combination of both.<sup>19</sup> Finally, the medial crural footplates are typically splayed.

### ASIAN NOSE

For the purposes of this discussion, Asian American rhinoplasty patients include Eastern Asians and Southeast Asians, including patients of Chinese, Japanese, Korean, Filipino, Thai, and Vietnamese descent. As mentioned previously, within each ethnicity, there is vast anatomical variation as a result of the diverse ethnicities and racial mixing in these populations. Although great variation exists, there are trends in the nasal anatomical features of Asians that differ from those of Caucasians, which are important to recognize during



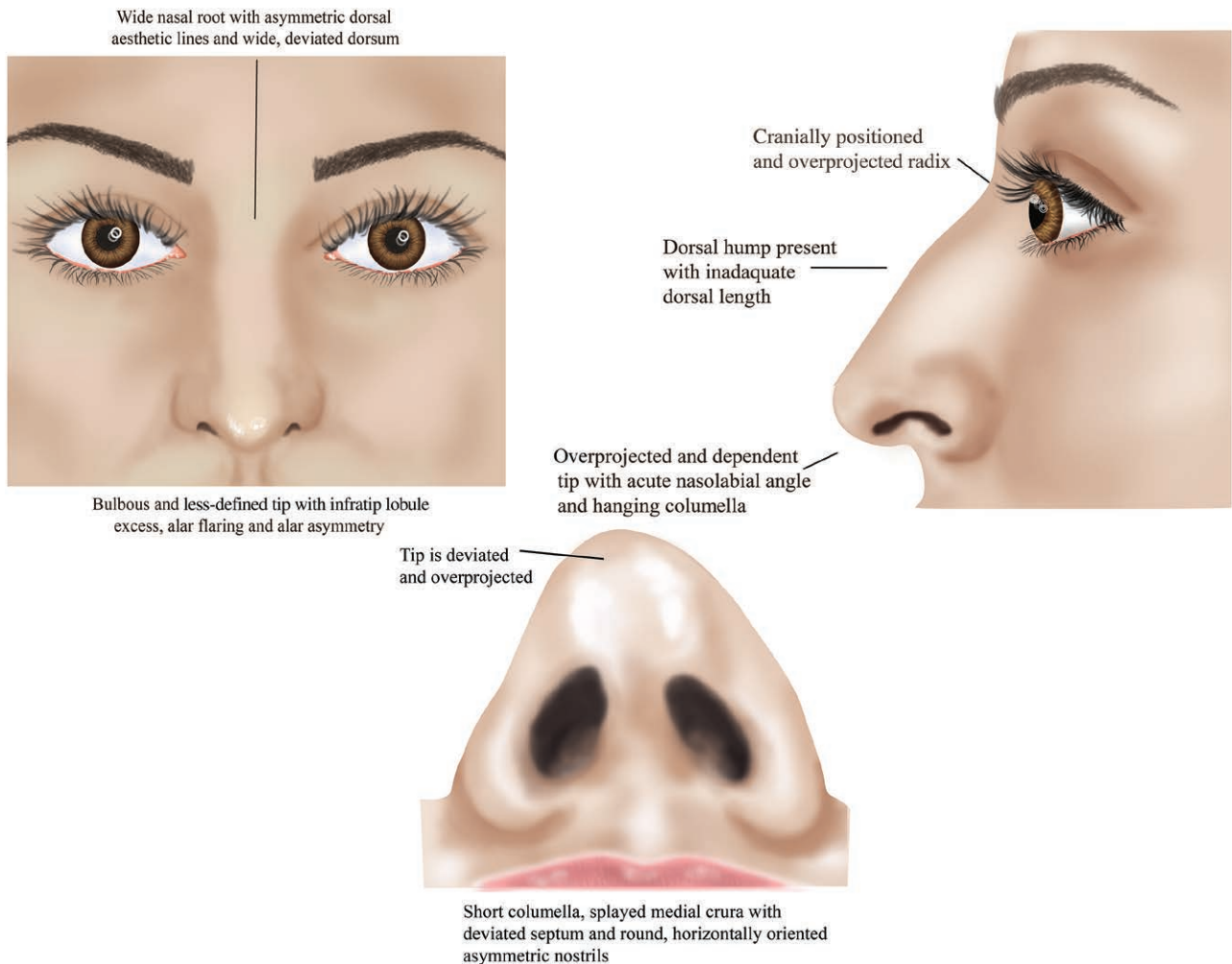
**Fig. 3.** Asian nose.

the nasal analysis.<sup>20,22–29</sup> Patients of Asian descent typically have relatively thick nasal skin. On frontal view, the facial proportions of the Asian patient vary from those of the Caucasian patient. When comparing the vertical facial fifths, patients of Asian descent are noted to have a wider intercanthal distance than Caucasian patients. In addition, they are noted to have prominent mandibular angles with a wide bigonial distance. Evaluation of the horizontal facial thirds reveals that Asian patients are noted to have upper and middle thirds that are larger than the lower third. The middle third is also larger than the upper third in this patient population. It is important to note that patients of Chinese descent have a less prominent upper third compared with the middle and lower thirds of the face.<sup>30</sup> Nasal evaluation on the frontal view demonstrates a wide nasal base and dorsum (Fig. 3, *above, left*). The bony vault is typically wide and short. The dorsal aesthetic lines are not sharply defined and lead to less-defined tip-defining points. The nasal tip is widened with wide alar bases. On lateral view, the radix is located more caudally and less

prominent compared with the Caucasian patient (Fig. 3, *above, right*). The nasofrontal angle is more obtuse (>130 degrees). The nasal length is shortened, with diminished tip projection. Patients are also noted to have a more obtuse nasolabial angle. The columella may also be retracted. Bimaxillary hypoplasia associated with a convex midface is noted on lateral view. Asian patients typically have more prominent lips and a relative microgenia. On basal view, there are wide alar bases, and the nostrils typically have a horizontal orientation (Fig. 3, *below*). Three types of columellar-lobule relationships have been described that include primary tip deficiency, primary columellar deficiency, or a combination of both.<sup>24</sup> Finally, there is medial crural footplate splay.

### INDIAN NOSE

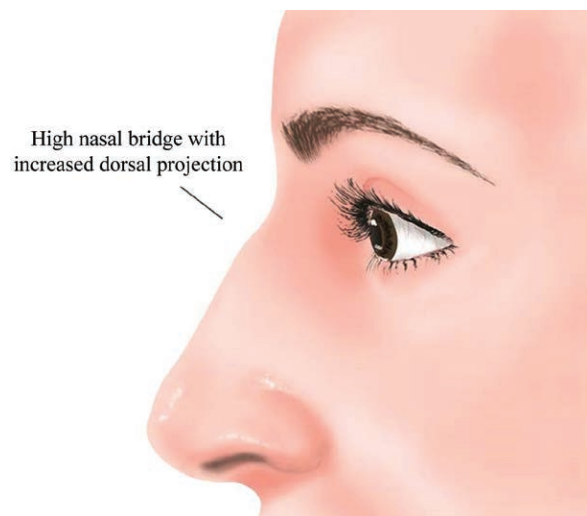
Indian American patients from a global perspective are patients of South Asian descent, which includes the countries of India, Pakistan, Bangladesh, and Sri Lanka.<sup>31,32</sup> As with patients of other



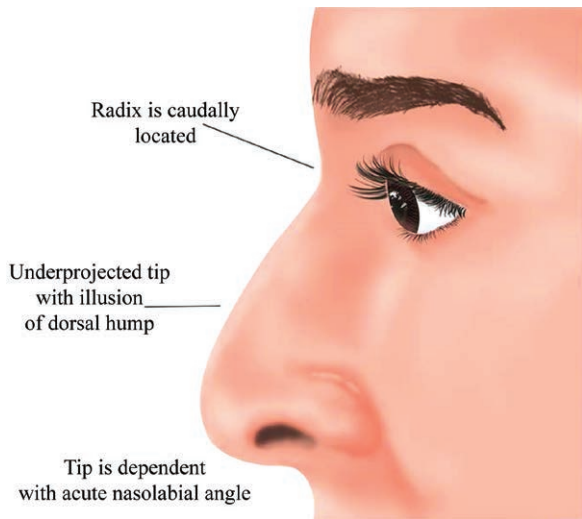
**Fig. 4.** Middle Eastern nose.

racial backgrounds, it is important to remember that anatomical variations exist within each ethnic group, and it is nearly impossible to define a “typical” Indian nose. Furthermore, Northern Indians have been known to have anatomical facial differences compared with Southern Indians, although they are variable for both groups. The Northern Indian nose has many features in common with the Middle Eastern nose, whereas the Southern Indian nose has many features in common with the African American nose. The Northern Indian skin pigmentation is lighter compared with Southern Indian patients. The skin is typically thicker in both groups compared with Caucasian nasal skin. On frontal view, the Northern Indian nose has a wide base and bony vault. (See **Figure, Supplemental Digital Content 1**, above, left, which shows the Northern Indian nose, <http://links.lww.com/PRS/D473>.) There is increased nasal length. The alar base and nasal tip may be deviated, although base width is typically appropriate, with a tendency to

be wider rather than narrow. The Southern Indian nose on frontal view is associated with a wide nasal base and bony vault. The dorsal aesthetic lines are



**Fig. 5.** The Castilian nose.



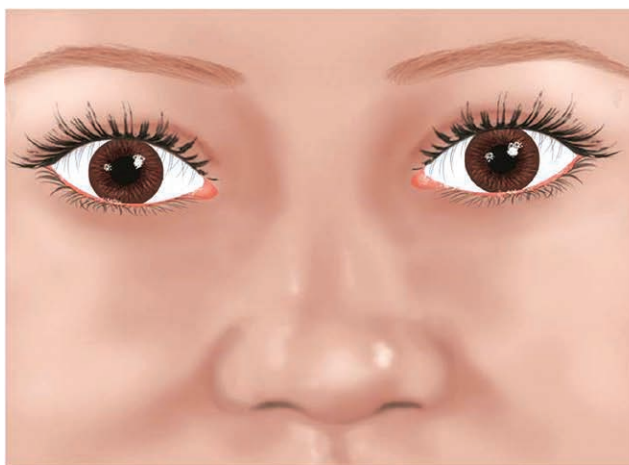
**Fig. 6.** The Mexican American nose.

poorly defined and lead to a bulbous tip with less-defined tip-defining points. The alar bases tend to be wide, with infratip lobular excess. (See **Figure, Supplemental Digital Content 2, above, left**, which shows the Southern Indian nose, <http://links.lww.com/PRS/D474>.) On lateral view, the Northern Indian nose radix is usually appropriately positioned, although it may be slightly overprojected. (See **Figure, Supplemental Digital Content 1, above, right**, which shows the Northern Indian nose, <http://links.lww.com/PRS/D473>.) There is typically a dorsal hump with an underrotated or acute nasolabial angle. The nose is long and has an overprojected nasal tip. The Southern Indian nose typically has a caudally positioned radix with lack of dorsal projection. (See **Figure, Supplemental Digital Content 2, above, right**, which shows the Southern Indian nose, <http://links.lww.com/PRS/>

**D474.**) The tip is underprojected and overrotated with an obtuse nasolabial angle. On basal view of the Northern Indian nose, the tip is overprojected, with tip and septal deviation. (See **Figure, Supplemental Digital Content 1, below**, which shows the Northern Indian nose, <http://links.lww.com/PRS/D473>.) Nostril asymmetry is common, as is splaying of the medial crural footplates. On basal view, the Southern Indian nose is underprojected, with a deficient columella. (See **Figure, Supplemental Digital Content 2, below**, which shows the Southern Indian nose, <http://links.lww.com/PRS/D474>.) In addition, the alar base is widened, with the nostrils horizontally oriented.

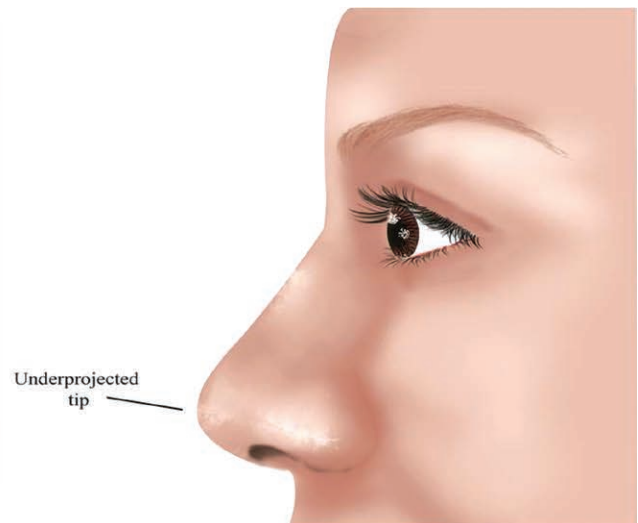
### MIDDLE EASTERN NOSE

Middle Eastern patients are typically considered patients of Arabic, Turkish, North African, or Persian descent.<sup>33</sup> Once more, we must clarify that oversimplification of nasal analysis of patients in any ethnic group should be avoided because of the vast anatomical differences that exist within each ethnic group. Although the Middle Eastern nose exhibits varied combinations of anatomical characteristics, various features are present in a significant portion of the population presenting for rhinoplasty and should be understood.<sup>2,20,33-37</sup> In general, patients of Middle Eastern descent have thicker nasal skin relative to Caucasians. The facial proportions are similar, with few exceptions, depending on the patient's country of origin.<sup>38</sup> On frontal view, the nasal root and nasal bones are wide (Fig. 4, *above, left*). The dorsal aesthetic lines are asymmetric and associated with a deviated dorsum.



Wide, bulbous tip with wide alar base

**Fig. 7.** The Mestizo nose.



**Table 2. Summary of Ethnic Variations Regarding Common Features and Anatomy of the Nose**

	Caucasian	Black	Asian	Indian	
				Northern	Southern
Frontal view	Equally proportioned vertical fifths and horizontal thirds of face	Wider middle fifths, shorter middle third of face	Wider middle fifths and larger upper and middle thirds of face	Variable fifths and thirds	Variable fifths and thirds
	Nasal length two-thirds midfacial height	Short nasal length	Short nasal length	Increased length	Variable length
	Symmetric DAL	Symmetric DAL	Less-defined DAL	Asymmetric DAL	Less-defined DAL
	Bony vault 80% of base width	Wide dorsum	Wide dorsum	Wide dorsum	Wide dorsum
	Alar base width equals intercanthal distance	Wide alar base width	Wide alar base width	Wide alar base width	Wide alar base width
Lateral view	Symmetric tip-defining points	Bulbous tip	Wide tip	Asymmetric tip-defining points	Bulbous tip
	Radix between lash line and supratarsal crease	Less-defined tip-defining points	Less-defined tip-defining points	Slightly overprojected radix	Less-defined tip-defining points
	Smooth dorsum	Less projected and caudally located radix	Low shallow radix	Dorsal hump	Less projected and caudally located radix
	Projection two-thirds of ideal length	Low dorsum	Smooth dorsum	Increased tip projection	Smooth dorsum
	Supratip break	Decreased projection	Decreased tip projection	No supratip break	Decreased tip projection
Basal view	NLA (male, 90–95 degrees; female, 95–100 degrees)	No supratip break	No supratip break	No supratip break	No supratip break
	Appears as an equilateral triangle	Increased NLA	Increased NLA	Decreased NLA	Increased NLA
	Tip-to-columella ratio, 1:2	Retracted columella	Retracted columella	Overprojected	Underprojected tip
	Symmetric nostrils with teardrop shape	Variable shape	Wide domes	Septal deviation	Short columella
		Short columella	Short columella	Asymmetric nostrils	Horizontally oriented nostrils
	Horizontally oriented nostrils	Horizontally oriented nostrils	Splayed MFP	Splayed MFP	

DAL, dorsal aesthetic lines; NLA, nasolabial angle; MFP, medial crural footplates.

The tip is less-defined and bulbous, with associated infratip lobular excess. The alar base width is similar to that of Caucasians, although there is typically alar flaring and nostril asymmetry. On lateral view, the radix tends to be more cephalic and overprojected (Fig. 4, *above, right*). A significant dorsal hump is commonly seen with inadequate nasal length. The tip is overprojected and associated with an underrotated nose or acute nasolabial angle (<90 degrees). In addition, a hanging columella with a dependent tip is frequently present. Often, a hyperdynamic tip may exist because of an overly active depressor nasi septi muscle. On basal view, the tip is deviated and overprojected (Fig. 4, *below*). The nostrils are asymmetric, round, and horizontally oriented, with a short columella. The medial crural footplates are splayed, and septal deviation is noted. Finally, there are often deep soft-tissue triangles.

## HISPANIC NOSE

The Hispanic nose, as with all other races, has significant anatomical variability.<sup>2,39–42</sup> Hispanic patients are people of Spanish-speaking countries or regions of origin, which include the Caribbean, Mexico, Latin America, South America, and Spain. Because of the vast geographic areas of origin, various ethnic origins, and racial mixing, the features of the Hispanic nose can be similar to the Caucasian, Middle Eastern, or African American nose, depending on the patient's heritage. Four different subtypes of Hispanic noses have been described, as follows: Castilian, Mexican American, Mestizo, and Creole noses.<sup>2,39</sup> As with the variation in patients, there is also great variation in skin tone and thickness in this patient population. On nasal analysis, patients with Castilian type noses have features similar to those of Caucasians on frontal view. The primary anatomical deviation in this group is increased dorsal projection or high nasal bridge on

**Table 2. Continued**

Middle Eastern	Hispanic			
	Castilian	Mexican American	Mestizo	Creole
Equally proportioned vertical fifths and horizontal thirds of face	Equally proportioned vertical fifths and horizontal thirds of face	Equally proportioned vertical fifths and horizontal thirds of face	Variable vertical fifths and horizontal thirds of face	Wider middle fifth and shorter middle third of face
Short nasal length	Nasal length two-thirds midfacial height	Nasal length two-thirds midfacial height	Nasal length two-thirds midfacial height	Short nasal length
Asymmetric DAL	Symmetric DAL	Symmetric DAL	Symmetric DAL	Symmetric DAL
Wide dorsum	Bony vault 80% of base width	Bony vault 80% of base width	Wide dorsum	Wide dorsum
Alar base width equal to or less than intercanthal distance	Alar base width equals intercanthal distance	Alar base width equals intercanthal distance	Wide alar base width	Wide alar base width
Bulbous tip	Symmetric tip-defining points	Symmetric tip-defining points	Bulbous tip	Bulbous tip
Less-defined tip-defining points			Less-defined tip-defining points	Less-defined tip-defining points
Overprojected and cranially located radix	Radix between lash line and supratarsal crease	Caudally located radix	Radix between lash line and supratarsal crease	Less projected and caudally located radix
Dorsal hump	Increased projection	Illusion of dorsal hump	Underprojected tip	Low dorsum
Increased tip projection	Projection two-thirds of ideal length	Decreased tip projection	Projection two-thirds of ideal length	Decreased projection
No supratip break	Supratip break	No supratip break	Supratip break	No supratip break
Decreased NLA	NLA (male, 90–95 degrees; female, 95–100 degrees)	Decreased NLA	NLA (male, 90–95 degrees; female, 95–100 degrees)	Increased NLA
Hanging columella; dependent tip				
Deviated and overprojected tip	Appears as an equilateral triangle	Underprojected tip	Underprojected tip	Variable shape
Short columella	Tip-to-columella ratio, 1:2	Tip-to-columella ratio, 1:2	Short columella	Short columella
Asymmetric nostrils	Symmetric nostrils with teardrop shape	Symmetric nostrils with teardrop shape	Symmetric nostrils	Horizontally oriented nostrils
Splayed MFP				Splayed MFP
Deep soft triangles				

lateral view (Fig. 5). On frontal view, the Mexican American nose is associated with proportions similar to those of the Caucasian nose. On lateral view, the radix is caudally located and associated with an underprojected tip, which creates the illusion of a large dorsal hump (Fig. 6). The tip is dependent, with an acute nasolabial angle. The Mestizo nose is associated with thick skin; a wide, bulbous tip; and wide alar base on frontal view (Fig. 7, *left*). On lateral view, the tip is underprojected (Fig. 7, *right*). The Creole nose has nearly identical features to the African American nose and can be analyzed as such.

**CONCLUSIONS**

After reviewing the spectrum of literature that exists on nasal anatomical features of the various ethnicities, it is evident that the diversity found within each ethnic group is significant and must be considered during the nasofacial analysis. A

thorough and well-organized nasofacial analysis is a prerequisite to ensuring harmony and balance in rhinoplasty. Understanding the typical features and how variation exists within each ethnicity is important to consider when evaluating patients of different ethnicities (Table 2). Furthermore, this understanding, combined with clear identification of patient goals and expectations, will allow the rhinoplasty surgeon to deliver an ethnically congruent and aesthetically harmonious result.

*Paul N. Afrooz, M.D.*  
 Dallas Plastic Surgery Institute  
 9101 North Central Expressway, Suite 600  
 Dallas, Texas 75231  
 paul.afrooz@gmail.com  
 Instagram: @drnvplasticsurgery

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