

Rhinoplasty: Incisions, Approaches and Analysis

180

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A thorough and thoughtful approach to nasal analysis is the foundation upon which a successful aesthetic and functional rhinoplasty outcome is built. A consistent strategy—routinely applied—will hone one's analysis skills and minimize the likelihood of failing to address something that should have been recognized preoperatively. By studiously engaging in this practice preoperatively and postoperatively, one will come to better appreciate the dynamics of rhinoplasty and the anatomic and surgical correlates of one's observations and interventions.

variability of aesthetics No doubt, aesthetic ideals will vary—from patient to patient, from culture to culture, and from surgeon to surgeon (1–5). Nonetheless, the “guidelines” contained in this chapter are intended to serve as a useful, practical framework upon which to evaluate nasal aesthetics and from which to move forward to surgical planning.

ANATOMIC LANDMARKS

Familiarity with the nomenclature used for the reference points of surface anatomy facilitates improved communication between colleagues and clarity of notes and the operative record. In addition, knowing how underlying structures are reflected on the surface topography enables the surgeon to more accurately analyze, diagnose, and anticipate the pathology and thereby develop a more thoughtful surgical strategy preoperatively. Accordingly, it is appropriate to begin with terminology.

The commonly accepted terms for surface nasal anatomy, as seen from the frontal, lateral, and base views, are illustrated in Figures 180.1 to 180.3 and defined below. Nasal anatomy is also covered and reviewed in greater detail in the chapter on “Surgical Anatomy of the Nose.”

Terminology

Trichion—the most anterior midline point on the hairline

Glabella—the most anterior or prominent point on the forehead (lateral view) *... common area of botox injection*

Nasion (aka radix)—the starting point, root, or visual takeoff of the nose, it is the deepest depression at the root of the nose in the midsagittal plane, corresponding to the nasofrontal suture. The midline junction between the frontal bone and the nasal dorsum is also known as the radix.

Rhinion—the midline junction of the nasal bones and the dorsal septum (osseocartilaginous junction)

Supratip—the point along the nasal dorsum that lies just cephalic to the nasal tip

Tip—the most anterior projecting part of the nasal profile (ideally). The tip “lobule” refers more broadly to the region bounded by the supratip superiorly, the anterior end of the alar crease laterally, and the anterior nostril margin posteroinferiorly. *bulbous tip, droopy, tip projection*

Infratip lobule—the part of the nasal tip seen from the nasal base view that sits anterior to the columella and leading edge of the nares and extends to the tip-defining point

Soft tissue triangle (or soft tissue facet)—seen from the nasal base, this refers to the soft tissue skin fold that lies anterior to the apex of the nostril and just behind the caudal border of the junction of the medial and lateral crus of the lower lateral cartilage

Subnasale—midline junction of the columella and upper lip

Labrale superior—the vermilion border of the upper lip

Stomion—the midline point at the junction of the upper and lower lips

Pogonion—the most anterior or prominent point on the chin (lateral view)

Menton—the lowest midline point on the chin



Figure 180.1 Surface anatomy nomenclature—frontal view.

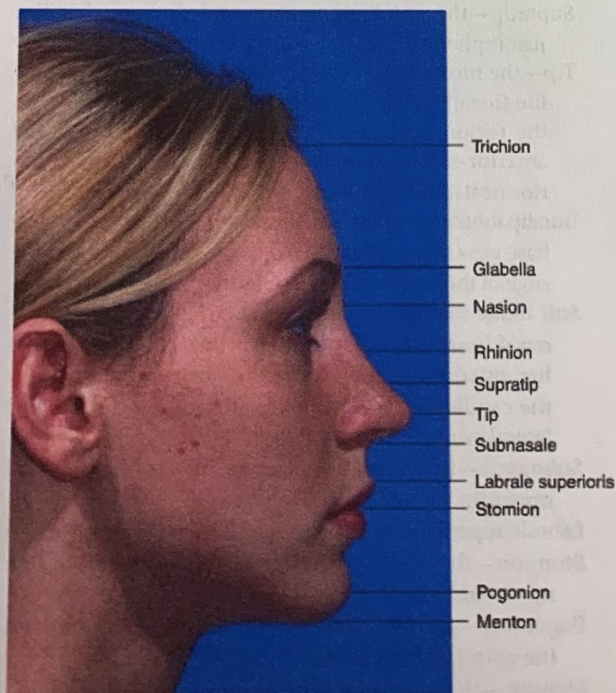


Figure 180.2 Surface anatomy nomenclature—lateral view.



Figure 180.3 Surface anatomy nomenclature—base view.

NASAL AND FACIAL ANGLES

The most commonly referenced angles applied to nasal analysis are the **nasofrontal angle**, the **nasofacial angle**, and the **nasolabial angle**. Collectively these generate information on features that have some bearing on nasal-facial proportion such as tip rotation, tip projection, and nasal length, and they are very useful when evaluating the nasal profile.

The **nasofrontal angle** (Fig. 180.4) is the angle measured between a line extending from the glabella through the nasion and a second line drawn from the nasion through the nasal tip-defining point. The ideal nasofrontal angle ranges from 115 to 135 degrees. The deepest point of the nasofrontal angle is known as the nasion (or radix). Perhaps more important than the actual angle measurement itself, the **position (superior vs. inferior)** and depth of the nasofrontal angle and nasion have significant bearing

angles help determine information about proportions

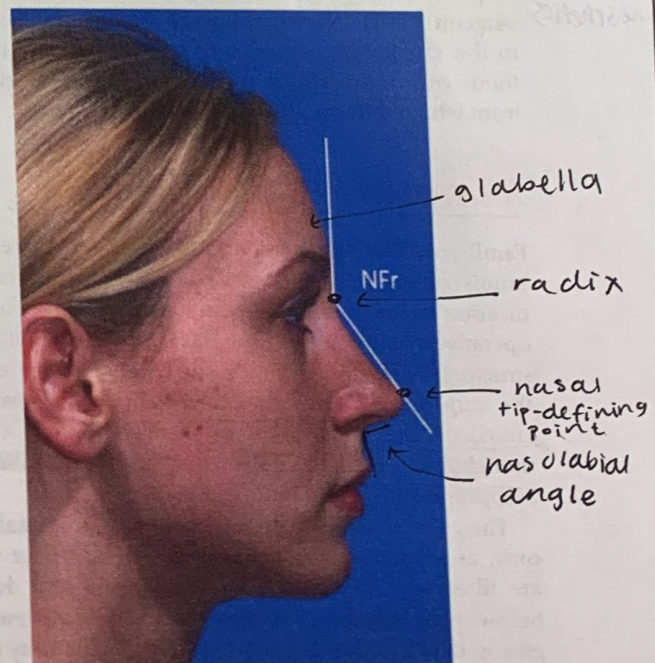


Figure 180.4 Nasofrontal angle—the normal angle measures 115 to 135 degrees.

greater angle size, ideal nose

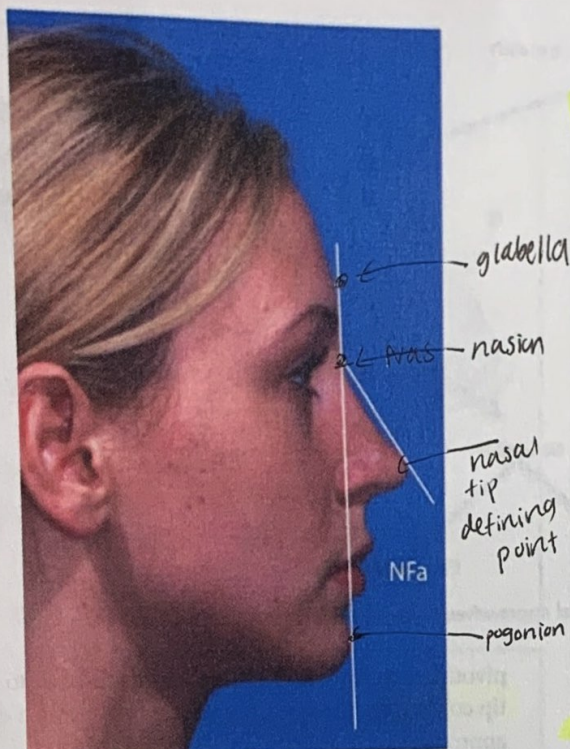


Figure 180.5 Nasofacial angle—the normal angle measures 30 to 40 degrees.

on the overall aesthetics and proportion of the nose as it relates to the rest of the face. This is discussed in greater detail in the section on nasal analysis.

The **nasofacial angle** (Fig. 180.5) is formed by a line from the glabella through the pogonion, intersecting with a line

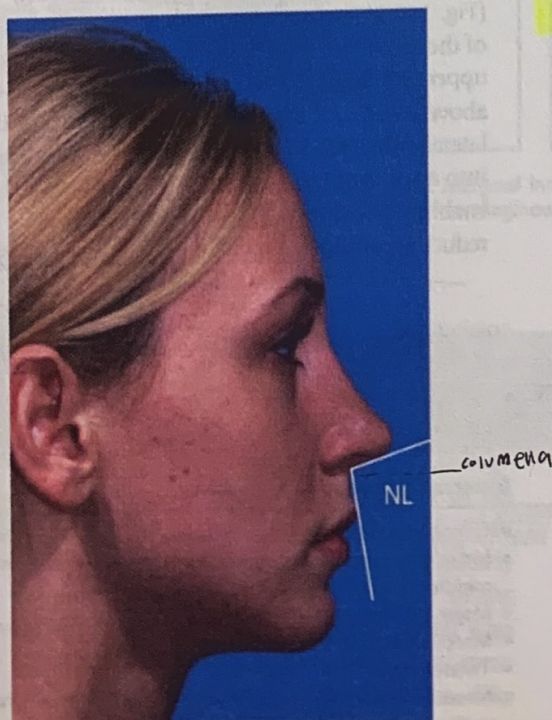


Figure 180.6 Nasolabial angle—the normal angle measures 90 to 115 degrees.

from the nasion through the nasal tip-defining point. The ideal nasofacial angle ranges from 30 to 40 degrees (ideal 36 degrees). A larger (more obtuse) angle reflects a relative increase in tip projection whereas the nasal tip would appear less projected with a more acute nasofacial angle.

The **nasolabial angle** (Fig. 180.6) is the angle formed between the upper lip (from subnasale to labrale superior) and the plane of the columella through the subnasale. The ideal nasolabial angle ranges from 90 to 115 degrees. Males typically have a more acute nasolabial angle (90 to 105 degrees) consistent with less tip rotation, while the ideal nasolabial angle in females ranges from 100 to 115 degrees in keeping with more tip rotation.

SURGICAL INCISIONS AND APPROACHES

An important distinction is made between surgical approaches and incisions.

A surgical approach refers to the means of exposing the structures of interest. The approach that is chosen will then dictate the incisions that are used to enable that approach. The surgical approach chosen for nasal surgery will vary with the training, comfort level, experience, and preference of the operating surgeon as well as the complexity of the case. While there are a variety of surgical approaches and the preferred approach may vary from surgeon to surgeon, as a general rule, the more severe or complicated the nasal deformity in question, the more likely the surgeon is to benefit from broader exposure.

Surgical approaches can be broadly categorized into external or endonasal approaches. Endonasal approaches can be subdivided into approaches to the nasal dorsum, the nasal septum, or the nasal tip, and endonasal tip approaches can then be further divided into delivery and non-delivery approaches (Fig. 180.7).

Although no absolute indication exists for either an external or endonasal approach and multiple factors will play into the choice of the operating surgeon as noted earlier, a reasonable set of guidelines for each, which may be of benefit to the less experienced surgeon, is outlined in Table 180.1.

Incisions

Surgical incisions are made to facilitate surgical exposure, but the incisions in and of themselves, properly made, have little or no impact on the ultimate dorsal contour, tip shape, or septal position. The surgical incisions most commonly used or referred to in the literature include

- The **marginal** (aka infracartilaginous) incision (Fig. 180.8)—an incision of variable length made along the caudal margin of the lower lateral cartilage. It may be along the caudal border of the lateral crus only in certain

more obtuse angle = ↑ tip projection

men have less tip rotation (smaller NL angle)

incisions are used to enable approach

endonasal and external approaches

incisions shouldn't impact the final nose shape

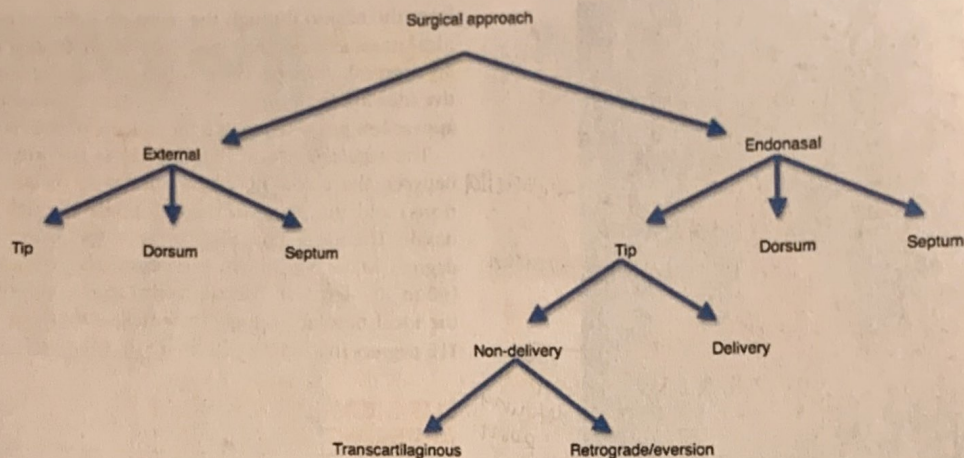


Figure 180.7 Surgical approaches to the nose.

circumstances, the medial crus only, or along the entire caudal edge of the lateral crus.

- The **transcolumellar** incision (Fig. 180.8)—an incision made transversely across the short axis (width) of the columella, joining bilateral marginal incisions at its lateral end to facilitate the external approach to the nose. It is typically sited over the medial crura about midway back along the columella and is generally irregularized (nonlinear) in some fashion for better camouflage and less scar contracture.
- The **intercartilaginous** incision (Fig. 180.8)—an incision made at the junction of the caudal border of the upper lateral cartilage and the cephalic border of the lower lateral cartilage (hence “inter”-cartilaginous). Alone it can provide access to the upper two-thirds of the nasal vault (bony and cartilaginous dorsum, nasal sidewall) as well as retrograde access to the lateral crura of the lower lateral cartilages. When combined with marginal incisions, it allows the surgeon to release and “deliver” the lower lateral cartilage as a bipediced chondrocutaneous flap,

pivoting inferiorly in a bucket-handle fashion to enable tip contouring in endonasal rhinoplasty using a delivery approach.

- The **rim incision**—an incision placed just within the nasal vestibule along the rim of the nostril margin. Owing to its proximity to the rim of the nares, any untoward healing or scar contracture with this incision carries a higher risk of visibility, retraction, notching, or irregularity along the alar margin as compared to a marginal incision, and as such, it has fallen out of favor and is less frequently used. *least used incision*
- The **transcartilaginous** (or cartilage-splitting) incision (Fig. 180.8)—an incision made through the lateral crus of the lower lateral cartilage caudal to the junction of the upper and lower lateral cartilage and at least 5 to 6 mm above the caudal margin of the lateral crus of the lower lateral cartilage. Effectively this divides the lateral crus into a superior (cephalic) and inferior (caudal) segment enabling removal of the cephalic strip for volume reduction of the tip cartilage.

← helps reduce tip cartilage

TABLE 180.1

GUIDELINES FOR SELECTION OF SURGICAL APPROACH

Endonasal Rhinoplasty

- Dorsal reduction
 - Modest reduction, nasal bones of normal length (not short nasal bones with long upper lateral cartilages)
 - Normal width and alignment of middle third of nasal vault
- Tip surgery
 - Primary (non-revision) surgery
 - To modify tip definition (boxy, wide, bifid, broad/bulbous tip)
 - No gross asymmetry
 - Modest increase/decrease in tip projection
 - Limited tip revision surgery
- Linear deviation of nasal dorsum in need of osteotomies

External Approach Rhinoplasty

- Congenital nasal deformities, for example, cleft lip rhinoplasty
- Major dorsal reduction or dorsal reduction with narrow/pinched middle third of nasal vault
- Major change in tip projection
- Marked nasal septal deformities
- Twisted nose
- Need for sutured-in-place structural grafting (middle nasal vault or lower third)
- Very thick skin
- Large septal perforation for repair
- Major secondary (revision) surgery

interesting that it's made nonlinear to hide

intercartilaginous incision allows for tip contouring

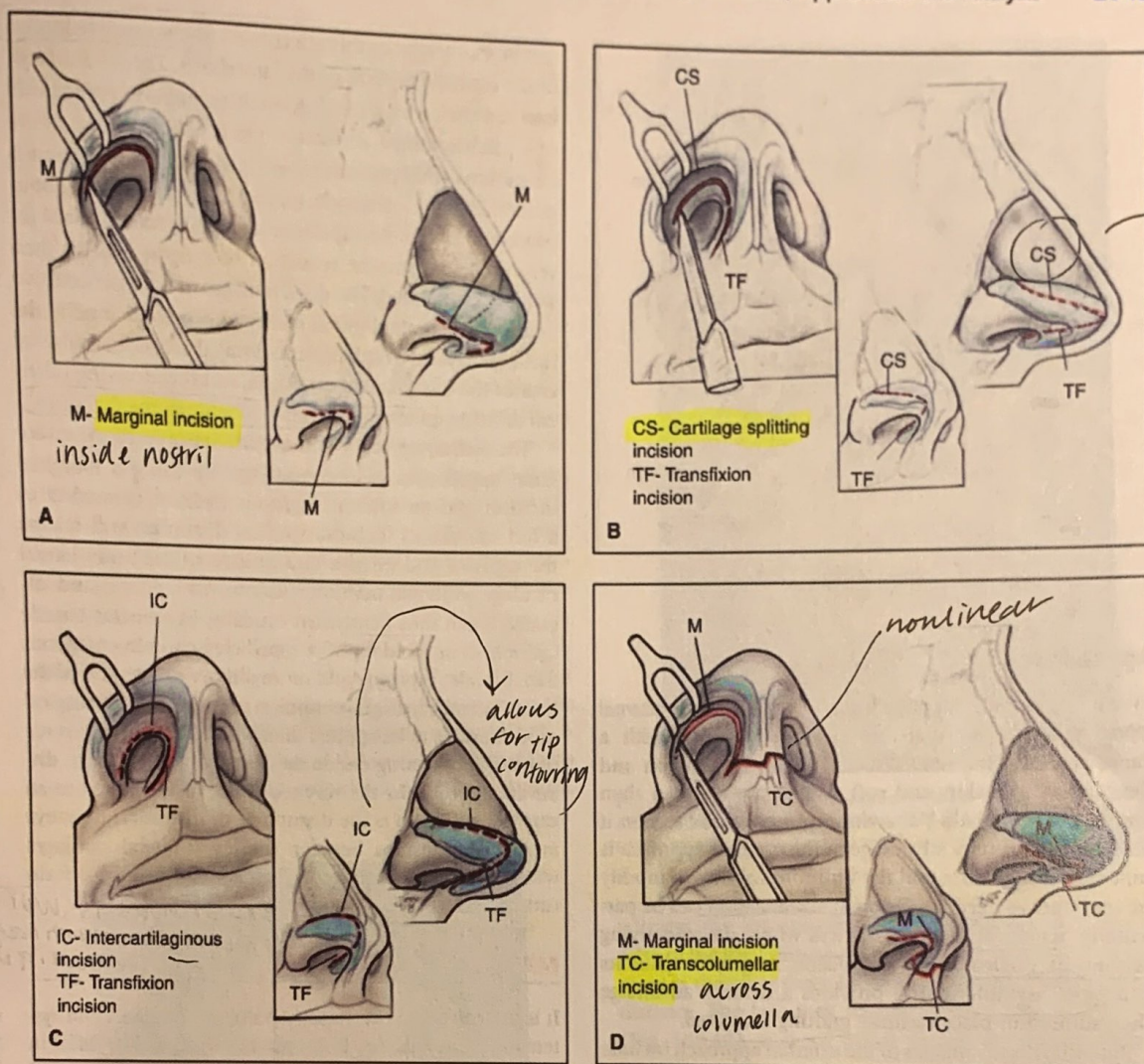


Figure 180.8 Nasal-tip incisions. **A:** Marginal incision. **B:** Cartilage splitting (trans-cartilaginous) incision and transfixion incision. **C:** Inter-cartilaginous and transfixion incision. **D:** Transcolumellar and marginal incisions.

- opens the nasal dorsum and allows access to both septum sides
- The **hemitransfixion** incision (Fig. 180.9)—an incision made unilaterally in the membranous septum at or just below the caudal edge of the septum. This allows access to one or both sides of the nasal septum and when combined with either an intercartilaginous or transcartilaginous incision dissection can facilitate exposure of the nasal dorsum right up to the nasion. *allows nasal dorsum to be exposed*
 - The **full transfixion** incision—an incision completely across the membranous septum from one side of the nasal vestibule to the other, just below the caudal edge of the septum. This incision separates the attachment of the medial crural feet from the caudal septum. Like the hemitransfixion incision, the complete transfixion incision enables access to either side of the septum, the anterior nasal spine, and the depressor septi muscle. It may be made alone or as a continuation of either an

intercartilaginous incision (to facilitate alar delivery in combination with bilateral marginal incisions or for dissection along the nasal dorsum) or a transcartilaginous incision (to facilitate dissection along the nasal dorsum).

■ The **Killian incision** (Fig. 180.9)—this incision is made through septal mucoperichondrium parallel and approximately 4 to 5 mm cephalic to the location of a hemitransfixion incision, further up in the nose proximal to the mucocutaneous junction. It is primarily a septal access incision. By virtue of its location, this incision preserves the mucosal attachment and blood supply to the most caudal aspect of the nasal septum. For septal deflections requiring modification of the caudal septum, either a hemitransfixion incision or external approach to the septum (depending on the severity of the problem) is preferred over the Killian incision.

incisions are septal access incisions

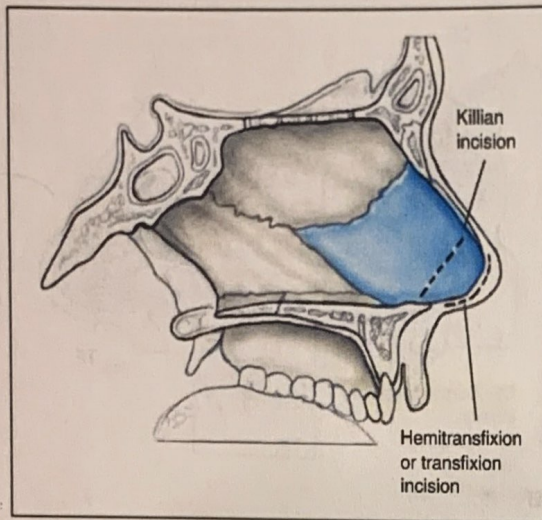


Figure 180.9 Nasal septal access incisions.

Approaches

As regards surgical approaches to the nose, the external approach combines bilateral marginal incisions with a transcolumellar incision as noted earlier. Dissection and elevation of the skin and soft tissue envelope can then continue in a cephalad direction right up to the nasion if need be. The primary advantage of the external approach is unparalleled exposure and the unlimited ability to modify the cartilages as need be. Optimal visualization can be particularly beneficial in circumstances where the underlying anatomy is unclear such as revision surgery or patients with gross asymmetry and provides a definite advantage when sutured-in-place cartilage grafting is desired.

Potential disadvantages of the external approach include the extent of dissection and therefore surgical trauma in situations where more limited dissection might suffice. Wider undermining with the external approach generally translates into more postoperative edema that persists longer than in the typical endonasal rhinoplasty. In circumstances where one can comfortably achieve the same or similar result through a less invasive approach, the attendant reduction in tissue trauma is desirable. Routine disruption of native cartilaginous attachments to skin may not always be necessary. Greater ligamentous disruption and skin undermining may in fact result in a greater loss of tip projection when compared to similarly applied techniques using an endonasal approach (6), thereby necessitating maneuvers to restore or reestablish tip projection. Finally, it must be said that greater exposure alone does not equate with better surgical results—failure to apply thoughtful, assiduous analysis and meticulous surgical technique will not be overcome merely by enhancing exposure.

There are a number of endonasal approaches to the nose. A retrograde approach utilizes an intercartilaginous incision for retrograde access to the lateral crura of the lower lateral

cartilages, thereby enabling a conservative volume reduction of the cephalic portion of the lateral crus. The transcartilaginous approach uses a cartilage-splitting incision for removal of a predetermined amount of the cephalic portion of the lateral crus (that portion superior to where the incision is made). Like the retrograde approach, the transcartilaginous procedure has limited application, being primarily used for very moderate volume reduction of a tip which is otherwise well structured. The disadvantages of both of these two approaches are the limited ability to otherwise modify the cartilage beyond a cephalic trim, limited access to the domal area of the lower lateral cartilages, and therefore the inherent difficulty of insuring symmetry between the two sides.

The delivery approach is the most versatile of the endonasal approaches to the nasal tip. By using a marginal incision and an intercartilaginous incision connected to a full transfixion incision, surgical dissection will release the superior and inferior attachments of the lower lateral cartilage while maintaining attachments medially and laterally. It can thus be pivoted caudally, in a bucket-handle fashion so as to “deliver” a bipediced chondrocutaneous flap. Broader exposure and more direct visualization of the lower lateral cartilages permits a greater range of surgical modifications to be applied than with either the retrograde or cartilage-splitting endonasal approaches. The main disadvantage with the delivery technique as compared to an external approach is the disruption or distortion of native in situ relationships between the lower lateral cartilages when delivered and greater technical difficulty with certain cartilage grafting techniques.

NASAL ANALYSIS

It is impossible to overstate the value of assiduous and systematic nasal analysis. Rhinoplasty surgeons may differ in terms of their own aesthetic ideal, their preferred surgical approach, instrumentation, dressings, postoperative care—in short, they may differ in almost every surgical sense. Except the value that they place on thoughtful preoperative analysis. On that they would all agree—careful and thorough preoperative analysis will promote better and more consistent outcomes, reduce revision rates, and minimize the traps that await oversight and errors of omission. Nasal surgery is not a good place for 20-20 hindsight.

Uniform and reproducible photographs are a fundamental part of the evaluation process and surgical planning, in addition to being an accurate reminder of the preoperative state. Images of consistent size, quality, lighting and positioning will facilitate an honest and accurate appraisal of postoperative changes as compared to the preoperative views. A more detailed discussion of the technical aspects of photo documentation is covered in Chapter 171 of this text.

The standard views for rhinoplasty are vertically oriented full face frontal, right and left oblique, right and left lateral views, and a base view (horizontally or vertically oriented).

Endonasal retrograde approach

moderate volume reduction makes it harder to ensure symmetry

Endonasal approach

Endonasal is worse for certain cartilage techniques

preoperative analysis is extremely important

external approach advantage: exposure and modification

exposure when unnecessary can lead to trauma and longer post-op

tip projection may be inhibited

human face can be divided into 3 equal parts

Optional views include the frontal close-up (to highlight particular asymmetries or a crooked nose), a "bird's eye" or dorsal view (for a crooked nose), and a lateral smiling view (to highlight the activity of the depressor septi muscle). A lateral view with a ruler alongside the patient's face can be helpful to enable one to make life-size reproductions, which then allow for accurate preoperative measurements to be made.

All parts of the physical examination, inspection, and palpation should impart meaningful information to the examiner at each and every step. For the skilled clinician, an impressive amount of information relevant to treatment (medical or surgical) can be gleaned in only a few minutes.

Evaluation of the rhinoplasty patient begins with an overall survey of facial proportion and symmetry. Naturally there will be some variation in anthropometric norms from one race to another as alluded to earlier. The typical occidental Caucasian face can be roughly divided into equal horizontal thirds (Fig. 180.10)—from the hairline (trichion) to the glabella, from the glabella to the subnasale, and from the subnasale to the menton (chin). As there is great variability in hairline position, another way of looking at nasal and facial proportion considers the distance from the nasion to the menton (Fig. 180.11). Using this method, a nose which is in relatively good proportion to the face as measured from nasion to subnasale, is 43% of the nasion-menton distance,



Figure 180.10 Facial proportion—the face can be roughly divided into equal horizontal thirds, from trichion (hairline) to glabella, glabella to subnasale, and subnasale to menton.

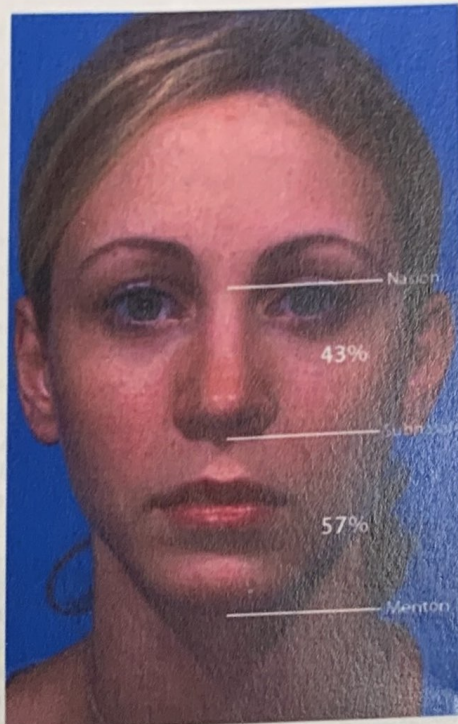


Figure 180.11 Facial proportion—lower facial two-thirds—the distance from nasion-subnasale is 43% of total nasion-menton distance, whereas the subnasale-menton distance is 57% of the total.

due to variability in hairline position, nose takes less than half of nasion to menton area

whereas the measurement from subnasale to menton is 57% of the total distance. The nasion-to-subnasale measurement is therefore three-fourths of the subnasale-to-menton distance. The face may also be divided into vertical fifths (Fig. 180.12), each of which equals the intercanthal distance (between medial canthi) or the width of the palpebral fissure (from medial to lateral canthus).

After an overall survey of facial proportion and symmetry is complete, inspection of the nose is carried out next from a frontal, lateral, and a base view, at rest and with normal inspiration. Any tendency of the lateral nasal wall or nasal ala to medialize or collapse on mild to moderate inspiration should be noted. Dynamic collapse of the nasal sidewall suggests instability or lack of proper structural support in that region, which should be addressed at the time of surgery.

Proper endonasal inspection of the nasal airway with a headlight and speculum further complements the information acquired from visual assessment of inspiratory stability. Ideally an endoscopic exam completes a physical examination of the nasal airway. At this point, the examiner should have a good sense of septal alignment, turbinate size, and width of the nasal valve angle (normal = 10 to 15 degrees).

Palpation of the nose follows. This gives the surgeon an indication of the thickness of the nasal skin, the presence of any palpable ridges or irregularities, the length of the

→ move / feel nose to get a sense of nasal skin thickness

full facial analysis prior to nose analysis

also examine the interior of nose



Figure 180.12 Facial proportion—the face can be divided into vertical fifths, each approximately equal to the intercanthal distance or the width of the palpebral fissure.

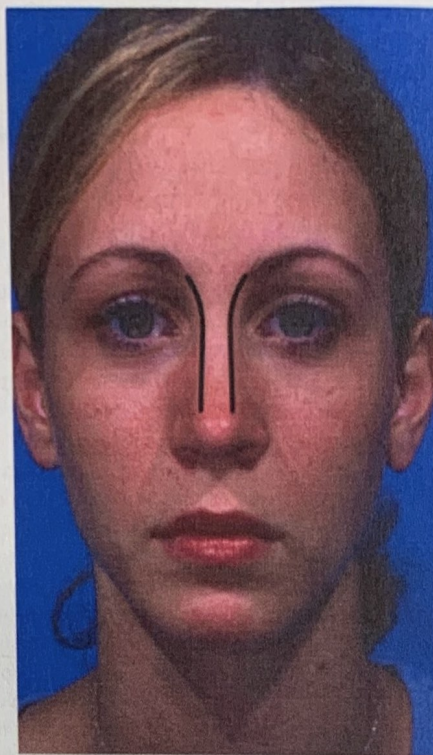


Figure 180.13 The brow-tip aesthetic lines outline the nasal dorsum.

nasal bones relative to the upper lateral cartilages along the nasal dorsum, and some sense of the intrinsic strength of the alar cartilages, tip support, and caudal septum.

Assessment is then carried out by examining the nose from a frontal view, oblique and lateral views, and base view.

On the *frontal* view the examiner should evaluate

- Overall symmetry. Asymmetries should be pointed out to the patient preoperatively.
- Alignment (straight or crooked) and where if any misalignment exists (upper one-third, middle one-third, and/or lower one-third). Problems with alignment might suggest the need for osteotomies, rasping, onlay grafts, spreader grafts, or nasal tip surgery depending on where the asymmetry is centered. This is further discussed in the chapters on tip surgery and the management of the crooked nose. Narrowing of the middle nasal vault in particular is important to recognize since medialization of the upper lateral cartilage in this region will increase airflow resistance through the internal nasal valve and may account for a functional problem that would merit spreader grafting.
- Tip definition and visible highlights or irregularities
- Width of the bony nasal pyramid (upper one-third of the nose) as well as that of the nasal base. The alar base width should fall within lines dropped from each medial canthus. The bony width should be about 75% to 80% of alar base width.

upper 3rd of nose constitutes pyramid
frontal view can show crookedness of nose

- The brow-tip aesthetic lines (Fig. 180.13)—paired, smooth, gently curving lines, which follow the curvature of the brow, continuing caudally down the lateral nasal dorsum (at the junction of the dorsum and nasal sidewall) to the tip-defining points. Deviations along this line may be seen in patients with prior trauma and crooked or twisted noses as well as in those with pinching or narrowing in the middle third of the nose where the upper lateral cartilages fuse with the dorsal septum (the internal nasal valve region).

trauma may change these lines

On the *oblique* view, one should evaluate

- The brow-tip aesthetic line. The left oblique view highlights the right brow-tip line and vice versa. Often irregularities along this line are well appreciated on the oblique view.
- The height of the nasal dorsum
- Soft tissue facets

height of nose

A substantial amount of information is revealed from examination of the nose in *lateral* view. Owing to the volume and complexity of what is seen from this view of the nose, it is helpful and therefore recommended to proceed in a methodical and reproducible fashion each and every time. In that respect, the author recommends first taking a broader view of the nose and how it relates to overall facial proportion and then proceeding sequentially from nasion

side view

to subnasale. In this way, one can avoid overlooking features of interest or import. Specifically, on the lateral view beginning at the root of the nose and moving caudally, one should evaluate

look at these during lateral view

- Radix position, radix projection, and nasofrontal angle. The ideal radix position or visual radix breakpoint should lie around the level of the supratarsal crease or between the crease and the upper eyelid margin. This will influence the height of the nose from nasion to subnasale, which should roughly equal 43% of the distance from nasion to menton. If the nasion or visual takeoff of the nose is low (a caudally positioned radix—often referred to as “low radix disproportion”), the nose will look shorter, the tip will appear to be relatively overprojected (a “bottom-heavy nose”), and the dorsal height will be somewhat exaggerated (Fig. 180.14), whereas the opposite is true when the radix is cephalically malpositioned (“high radix disproportion”). Regarding radix projection, Byrd calculates the normal radix projection to be $0.28 \times$ ideal tip projection (see calculation under tip projection), which generally corresponds to 9 to 14 mm from the anterior corneal plane (7). An underprojected radix (deep radix) will exaggerate any apparent dorsal height and may create the illusion of a “pseudohump” when dorsal height might be appropriate (8). In addition, a deep radix, much like a low radix, will make the nose look shorter and the tip look relatively overprojected while an overprojected (shallow) radix will make the nose look longer and the tip less projected. A deep or low nasofrontal angle (deep or low radix) might warrant the need for radix grafting to bring the radix forward or higher and to improve upon relative proportions of the nose.

- The length of the nose, from radix to the most anterior projecting point on the tip. Byrd's dimensional analysis (7) derives ideal nasal length from measurements taken from either the midface or lower face. Midfacial height (MFH) is the measured distance from the glabella to the alar base plane (a transverse line through the alar base, perpendicular to the vertical axis of the face). Using his method, ideal nasal length is two-thirds of MFH (using midfacial measurements), or equal to the distance from the stomion to the menton (using lower facial measurements). When the mandible is underdeveloped (e.g., microgenia), the midfacial guideline is preferred.

- The height of the nasal dorsum and whether it be in need of reduction, augmentation, or neither. Height of the nasal dorsum, or lack thereof, is clearly considered relative to the radix depth and nasal-tip projection. With appropriate radix position and depth, if one were to draw a line from the nasion to the tip-defining point, the height of the dorsum would either be level with that line (male) or 1 to 2 mm below that line (female) conferring a slight supratip break so that the leading point of the nose is the tip and not the dorsum.

- The presence or absence of a supratip break (seen when the tip projects just slightly anterior to the dorsal line in the lateral view)

- Nasal tip projection. There are several methods to assess tip projection. Byrd calculates that ideal tip projection, measuring from the alar cheek junction to the anteriormost point on the tip, is two-thirds of ideal nasal length (as calculated above) (7). Crumley describes the nose as a right angle triangle with a 3:4:5 ratio, whereby nasal-tip projection is 60% (three-fifths) of nasal length from nasion to tip-defining point (9) (Fig. 180.15). Goode draws a vertical line from the nasion through the

low nasion = shorter nose, overprojected tip

mathematical implications

deep radix makes nose overprojected

associated with radix evaluation

Arthur/Goode views nose as right triangle

additional mathematical implication



Figure 180.14 Low radix disproportion—a deep or caudally positioned radix (arrow) as seen preoperatively on left will make the nose appear shorter, the tip appear relatively overprojected, and the dorsal height appear exaggerated. Postoperatively on right, after radix augmentation with only conservative dorsal reduction, the radix takeoff has been moved cephalically and the nose looks better balanced and proportionate.



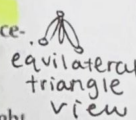
Figure 180.15 Crumley's 3:4:5 right angle triangle estimates appropriate tip projection to equal three-fifths (60%) of nasion-to-tip distance. Goode's calculations yield similar proportions.

alae cheek junction and a second line perpendicular to the first running from the alar facial junction to the nasal tip. Using his technique, this second line, which reflects tip projection, is 0.55 to $0.60 \times$ nasion-to-tip distance (nasal length) (10). These lines essentially recreate the same 3:4:5 right angle triangle described by Crumley.

- The **columellar double break**—a slight change in plane along the nasal base at the transition point from the columella to the infratip lobule at the anterior nares
- The **alar-columellar relationship**. Normal columellar show as measured on lateral view from the highest point on the curved alar rim to the lower edge of the columella is 2 to 4 mm. Values in excess of that may be due to an overly long caudal septum, bowing of the medial crura or alar retraction. Measurements below 2 mm can be due to a retruded columella, foreshortened caudal septum or alar hooding (11).
- **Tip rotation or the nasolabial angle**. The ideal range is approximately 90 to 115 degrees, with men being generally more acute and women being more obtuse.
- **Chin position**. In men, the most anterior point of the chin (the pogonion) should lie at or just anterior to a vertical line dropped from the vermilion border of the lower lip, whereas in women the pogonion should be at or just behind that line. With obvious microgenia, a discussion of chin augmentation or advancement genioplasty is warranted to optimize overall facial balance.

On the **base view**, the examiner should evaluate

- **Symmetry**. Are there visible irregularities of the tip cartilages? Are the nostrils symmetric?
- Shape of the nasal base. Is it **nicely triangular** (isosceles) or boxy, broad, amorphous, trapezoidal, etc.?
- Bifidity (separation) of the alar domes
- Contour of the alar sidewall. Is the alar sidewall straight or slightly convex and stable, or is there any buckling/concavity of the lateral crura or alar collapse, either at rest or with inspiration (suggestive of external nasal valve compromise)?
- The position of the caudal septum
- The columella-to-lobule ratio. Ideally 2:1
- Width of the alar base



main emphasis on symmetry in every view

CONCLUSION

Fluency with the nomenclature, understanding the utility of the various nasal incisions and merit of different surgical approaches and having a consistent framework to apply to nasal analysis are the essential starting points for the rhinoplasty surgeon, and this chapter is intended to serve as a useful resource in that regard.

It has been said that **diagnosis precedes technique**. As one of the most challenging, humbling and variable procedures in facial plastic surgery, successful rhinoplasty is heavily predicated upon accurate preoperative assessment and diagnosis. It is thus incumbent upon the rhinoplasty surgeon to develop a dependable, thorough and reproducible approach to nasal analysis. In this way, more consistently successful results and greater levels of patient and surgeon satisfaction are assured.

preoperative assessment is just as important as surgical technique

HIGHLIGHTS

- Thoughtful, systematic and precise preoperative nasal analysis is the foundation of a well-planned and well-executed rhinoplasty.
- Fluency with proper terminology and nomenclature enables better record keeping and clearer communication between colleagues.
- Racial and anthropometric "norms" account for differences in "ideal" facial and nasal proportions and characteristics.
- Surgical approaches to the nose should be chosen based on experience, the surgical plan and complexity of the case. The goal is always maximal results with minimal surgical intervention. Once chosen, the surgical approach guides the selection of incisions.
- Each preoperative photograph conveys specific information—knowing what to look for and how to study each image is a vital skill to acquire for anyone performing rhinoplasty surgery.

area in mid of nose

NL angle again, women's is more obtuse

women should be a bit less projected

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