Rhinoplasty Approaches

Current State of the Art

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Objective: To survey rhinoplasty surgeons to determine their current approaches and the reason for their use, how they have acquired their knowledge, and trends in the use of open and closed approaches.

Design: A rhinoplasty questionnaire on open and closed rhinoplasty approaches was presented to surgeons attending the annual meetings of the American Academy of Facial Plastic and Reconstructive Surgery and the American Academy of Otolaryngology–Head and Neck Surgery. The 178 questionnaires were reviewed for analysis, and the results were tabulated by a statistician. Raw data were analyzed and cross-tabulations of specific subsets were reviewed. Main outcome measures included proportion of surgeons in various demographic groups using each technique, preferred incision, reasons for using each technique, usage over the past 5 years, and expected trend in the next 5 years.

Results: Most of the surgeons were in private practice, and most described their practice as otolaryngology (ear, nose, and throat [ENT]), facial plastic surgery (FPS), or ENT/FPS. Of the 178 responding surgeons, 46% had FPS practices and 27% devoted 90% to 100% of their practice to FPS. Most perform 100 or fewer rhinoplasties annually, and 23% perform open rhinoplasty 90% to 100% of the time. Sixty-three percent of FPS surgeons and 55% of ENT/FPS surgeons perform open septorhinoplasty (OSR) more than 50% of the time. Surgeons learn OSR mostly during residency (56%) and in didactic courses (51%) and learn closed rhinoplasty mostly during residency (75%). The most common indications for open rhinoplasty were difficult tip surgery (74%), revision procedures (73%), and grafting procedures (68%). Simple tip (65%) and simple dorsal (73%) procedures were common indications for closed rhinoplasty. The preferred incision for open rhinoplasty was the inverted “V” transcolumnellar gull wing (58%); for closed rhinoplasty, cartilage delivery (48%) and intercartilaginous (28%). Most surgeons performed OSR at the same frequency during the past 5 years and expected to use OSR at the same frequency in the next 5 years.

Conclusions: Overall, 53% of respondents used OSR more than 50% of the time. The movement toward open rhinoplasty seems to be plateauing, with a possible slight upward trend in its use. Over the past 5 years, there was still some trend toward the increasing use of the OSR approach, and most surgeons are performing OSR at the same frequency. Those with more than 5 years’ experience believe that they are unlikely to change their approach in the next 5 years. Open septorhinoplasty may be indicated for rhinoplasties by a large proportion of surgeons, especially for rhinoplasties that are “difficult” or revisions or those requiring grafting.

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OPEN RHINOPLASTY IS AN old technique, first described in India in the seventh century with the writings of Sushruta. Although open rhinoplasty was well established in Europe during the last century, it was not until 1970 that North Americans were introduced to this technique. Through the work of Goodman1 in Canada and Anderson et al2 in Louisiana, open rhinoplasty was popularized such that, at present, this approach is taught in most residency training programs.

Rethi3 of Hungary described a high columnellar incision to deproject the tip in 1934. Sercer4 of Zagreb, Croatia, extended this incision with his “Dekortication” of the nose in 1958. While Rethi had excised the columella as a means to an end, Sercer’s incision provided exposure to the ossecocartilaginous skeleton. His protégé, Padovan,5 further applied the approach for septoplasty, as well as cleft rhinoplasty and posttraumatic rhinoplasty in 1966. He presented his work in 1970 at the First International Symposium for the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS) in New York, NY. His lecture, “The External Approach to Rhinoplasty,” was heard by Goodman,1 who promoted and developed this technique, and 10 years later Anderson et al2 also began to promote this approach.
Rhinoplasty surgeons attending the September 2002 annual meetings of the AAFPRS and American Academy of Otolaryngology—Head and Neck Surgery (AAO-HNS) (in San Diego, Calif) were given an opportunity to report on their rhinoplasty practices with the following questionnaire:

**Rhinoplasty Questionnaire:**

1. What is your practice experience?
2. What type of practice do you have? Resident or Fellow, Private Solo, Private Group, Academic, Military, Other
3. How would you describe your practice? General Otolaryngology, General Plastic Surgery, Cosmetic Surgery, FPS [facial plastic surgery], ENT [ear, nose, and throat]/FPS, Other
4. What percentage of your practice is devoted to FPS?
5. Approximately how many rhinoplasties per year do you perform?
6. What percentage of all of your rhinoplasties do you perform by the open (external) approach compared with the closed (endonasal) approach?
7. What percentage of your cosmetic (ie, primarily esthetic) rhinoplasties do you perform by the open (external) approach?
8. What percentage of your reconstructive (ie, primarily congenital, functional, traumatic, postablative) rhinoplasties do you perform by the open (external) approach?
9. How did you learn to perform the open (external) approach? Residency, Fellowship, Didactic Courses, Cadaver Courses, Videotapes, Observational Visits, Other
10. How did you learn to perform the closed (endonasal) approach? Residency, Fellowship, Didactic Courses, Cadaver Courses, Videotapes, Observational Visits, Other
11. Over the past 5 years have you performed open (external) rhinoplasty, compared with closed (endonasal) rhinoplasty, More Frequently, With About the Same Frequency, or Less Frequently?
12. In the next 5 years do you expect to perform open (external) rhinoplasty, compared with closed (endonasal) rhinoplasty, More Frequently, With About the Same Frequency, or Less Frequently?
15. What is your most preferred incisional approach when performing a closed (endonasal) rhinoplasty? Marginal or Rim Incision, Intercartilaginous Incision, Cartilage Delivery (Marginal Plus Intercartilaginous Incision), Other
16. What is your most preferred incisional approach when performing an open (external) rhinoplasty? Inverted “V” Transverse Mid-Columellar Gull Wing, Transverse Mid-Columellar Gull Wing “V”, Mid-Columellar Stair-Step, Mid-Columellar “V”, Low-Columellar “V”, Vertical Midline, Other

The results were tabulated and then analyzed by a biostatistician.

**RESULTS**

A total of 178 surgeons answered the questionnaire. The practice experience varied (Figure 1A). Most of the surgeons were in private practice, with 47% solo and 29% in group practice. The percentage of respondents by type of practice is shown in (Figure 1B). Of the 178 surgeons, 27% devoted 90% to 100% of their practice to FPS; however, 56% devoted 50% or less. Most of the surgeons performed fewer than 100 rhinoplasties annually (Figure 1C).

Regarding open rhinoplasty, 23% of the surgeons performed it 90% to 100% of the time (19% performed it 0% to 10% of the time), 26% performed it 90% to 100% of the time for cosmetic cases (23% performed it 0% to 10% of the time for cosmetic cases), and 32% performed it 90% to 100% of the time for reconstructive cases (19% performed it 0% to 10% of the time for reconstructive cases). Surgeons learned open and closed rhinoplasty under different settings (Figure 2). Five-year trends for the open approach were 24% for the surgeons who reported more frequent use, 58% for those who reported use at the same frequency, and 17% for those who reported less frequent use. Expected future 5-year trends for the open approach were 8% for more frequent use, 74% for use at the same frequency, and 11% for less frequent use. Figure 3 shows the expected 5-year trends by the surgeons’ years in practice.
Responses for indications for open and closed rhinoplasty are shown in Figure 4. The most common indications for open rhinoplasty were difficult tip surgery (74%) and revision procedures from another surgeon (73%). Simple tip and simple dorsal surgery were the less common indications (20% and 5%, respectively) for open rhinoplasty, compared with being the most common indications for the closed approach (65% and 73%, respectively).

The preferred incision for open rhinoplasty was the inverted “V” transcolumellar gull wing (58%). Eleven percent preferred the transverse midcolumellar gull wing “V” 8%, the midcolumellar “V”; 5%, the midcolumellar stair step; 4%; the low columellar “V”; 1%; the “W” shape and no one reported on the vertical midline incision. The preferred incision for closed rhinoplasty was via cartilage delivery (48%). Twenty-eight percent chose intercartilaginous; 14%, marginal or rim; and 4%, intracartilaginous.

Figure 5 shows the preferred type of incision for the closed and open approach by the surgeons’ years in practice.

All data were tabulated, and specific questions were asked to evaluate certain subsets.

- Questions 1 × 6: Younger surgeons perform open rhinoplasty more frequently than older surgeons for all procedures (Figure 6). Also for residents, 20% primarily learned the closed approach, and 60% primarily learned the open.

- Questions 5 × 6: In relating how many rhinoplasties are performed with the percentage that are performed with the open approach (Figure 7), most of those performing less than 100 procedures per year use open septorhinoplasty (OSR) more than 50% of the time, while most of those performing more than 100 procedures per year use closed techniques. The greatest use of open rhinoplasty was in the group performing 51 to 100 procedures per year, and 33% of those performing more than 150 procedures per year still use OSR most of the time. In general, surgeons with more experience tend to use the closed approach more often but only those who perform more than 100 rhinoplasties per year, and even they still perform a notable minority of OSR procedures. Overall, 53% of respondents use OSR more than 50% of the time.

- Questions 1 × 4: In evaluating practice experience and how much of the practice is devoted to FPS, surgeons tend to devote a minority of their practice to FPS (10%-50%) or their practice is predominantly FPS (>90%). Of all practice experience, 45% is described as performing 10% to 50% FPS, while 30% of all practice experience is described as performing more than 90% FPS. If one’s practice was devoted to less than 50% FPS, it remains that way; otherwise, one predominantly performs FPS. Of those at 1 to 5 years of experience, 35% describe their practices as 90% FPS. This drops to 17% for those at 6 to 15 years of experience but increases to 32% and 38% at more than 15 years and more than 25 years, respectively. A certain percentage of surgeons reported their practice growing after committing to FPS.

- Questions 1 × 11: In evaluating those with different practice experience and whether they have performed OSR more or less frequently in the past 5 years, in all experience groups, most are performing OSR at the same frequency (Figure 3A). Of those changing their frequency of OSR use, more surgeons are doing it more frequently rather than less frequently. Over the past 5 years, there is still some trend to increasing use of the OSR approach: the only group using it slightly less are those in practice for 16 to 25 years.

- Questions 1 × 12: In evaluating expectations for the use of OSR in the next 5 years, residents have the highest proportion of those who think they may perform OSR more or less frequently in the next 5 years, with 30% reporting more frequently and 30%, less frequently (Figure 3B). This reflects that they are doing what their staff teaches them. Those with more than 5 years’ experience, especially, believe that they are unlikely to change their approach (83%-92% will stay the same). Of the surgeons with more than 5 years’ experience, about the same proportions believe they will do OSR more or less frequently. The movement toward open rhinoplasty seems to be plateauing with possibly a slight upward trend in its use.
Questions 1 × 16: In considering practice experience and preferred open approach (Figure 5A), in all experience categories except those with more than 25 years' experience, the inverted “V” transverse gull incision is preferred by most. The transverse “V” gull wing and mid-columellar “V” are the next most popular incisions but relatively uncommon. The stair-step incision is rarely used.

Questions 1 × 15: In considering practice experience and preferred closed approach (Figure 5B), cartilage delivery and intercartilaginous incisions are preferred equivalently by those in practice for up to 5 years. After 5 years' experience, cartilage delivery becomes more popular for most. As surgeons gain experience, they will use the marginal incision more, but it is still relatively rare. A few will explore “other” types of incisions. Most closed rhinoplasties at present are performed via cartilage delivery and intercartilaginous incisions.

Questions 2 × 5: In evaluating the relation between type of practice and how many rhinoplasties are performed per year, the most common range for number of rhinoplasties performed in each group were 56% at 11 to 25 procedures per year for residents, 32% at 11 to 25 procedures per year for solo practitioners, 37% at 26 to 50 procedures per year for group practitioners, 40% at 26 to 50 procedures per year for academics, and 66% at 51 to 100 procedures per year for military (although n=3). Of

Figure 4. Indications for the open (A) and closed (B) approach by survey respondent.
the residents, 21% are performing less than 11 rhinoplasties per year. The practice type does not appear to influence the number of rhinoplasties being performed.

- Questions 3 × 6: In considering who performs OSR the most (Figure 8), those who describe their practice as FPS perform OSR more often, with 63% of them reporting they use it more than 50% of the time (ie, 16% use it 51%-75%; 20% use it 76%-90%; and 27% use it 91%-100% of the time). This compares with those who describe their practice as ENT/FPS and ENT, with 55% and 48%, respectively, reporting they perform OSR more than 50% of the time. Of those who describe their practice as ENT/FPS, 36% use OSR and 9% use the closed approach more than 90% of the time. Of those who describe their practice as FPS, 26% use OSR and 14% use the closed approach more than 90% of the time. Of those who describe their practice as ENT, 15% use OSR and 19% use the closed approach more than 90% of the time. The numbers are too small to comment for general plastic and cosmetic surgeons. Several ENT surgeons appear to perform equal numbers of open and closed rhinoplasty.

- Questions 13 × 14: In evaluating indications for using OSR (Figure 4A), except for “simple” cases, OSR may be indicated for rhinoplasty by a large proportion of surgeons, especially for rhinoplasties that are “difficult,” revision, or grafting cases. In evaluating indications for the closed approach (Figure 4B), the closed approach is preferred by most surgeons for “simple” cases with relatively small proportions using it for difficult, revision, or grafting cases.

- Questions 9 × 10: Surgeons primarily learn OSR through residency training and didactic courses, but fellowships, videotapes, observational visits, and cadaver courses still play a major role (Figure 2). Surgeons primarily learn closed rhinoplasty through residency. Fellowship, didactic courses, videotapes, observational visits, and cadaver courses play a role but somewhat less than for OSR.

More than 30 years have passed since the introduction of OSR in North America. From our survey analysis, it is clear that this approach has gained wide acceptance as a good approach, if not the preferred approach, for rhinoplasty. One of the most striking observations from this analysis was that OSR is used by 53% of surgeons most of the time, and in surveying contemporary facial plastic surgeons, 63% of them performed the OSR approach most of the time. This is of particular interest because the open approach to rhinoplasty has been enshrined in controversy since
its inception, and this indicates an exceptional acceptance of this approach over the past 30 years. Proponents of closed rhinoplasty initially criticized this technique, vigorously citing potential problems such as unnecessary scarring, reduction of tip support, extended operative time, and excessive postoperative tip swelling. However, it is clear that the open approach can be advantageous by offering better exposure to a small surgical field. The open approach allows the surgeon to better diagnose the deformity through inspection, to better execute certain maneuvers, and to teach and learn the operation with greater ease. It may also be that revision rates for primary OSR are less than those for closed rhinoplasty.

Vuyk and Olde Kalter published a meta-analysis of reports of columellar scarring after open rhinoplasty, since this was one of the earliest and most confirmed oppositions. In the 986 patients described in 7 articles, only 3 had columellar flap necrosis that lead to scarring. Also, many claimed the open scar was longer when, in fact, it and the marginal incision are shorter than the scars of a cartilage delivery technique and do not affect the intercartilage anatomy of the nose. Their findings demonstrated that the main vasculature of the nose runs aloft the musculoaponeurotic layer, or in it and parallel to the alar margin (as compared with vertically in the columella). The surgical implications of these findings are that dissection above the musculoaponeurotic layer serves to disrupt necessary venous and lymphatic channels, thereby contributing to and perhaps prolonging postoperative tip edema. It is not the transcolumellar incision of OSR that leads to increased edema. Indeed, operative times may be longer because more time may be taken to deal with the asymmetries that are uncovered. These can be corrected with no or minimal tissue distortion bimanually.

Our analysis revealed that surgeons primarily learn OSR through residency training and didactic courses. Furthermore, younger surgeons perform open rhinoplasty more frequently compared with older surgeons for all indications. Open septrhinoplasty provides an opportunity for greater surgical exposure for the operating surgeon and the assistants and thereby provides an excellent teaching tool. As this approach is used in didactic teaching sessions, more surgeons in training are exposed to the approach and may be more apt to continue with this approach in their later practices. In general, surgeons with the greatest experience (>100 rhinoplasties per year) tend to use the closed approach more often, but, nonetheless, even they still perform a notable amount of OSR. There is still some trend to increasing use of the OSR approach: the only group using it slightly less are those in practice 16 to 25 years. These data may reflect that older surgeons were less exposed to the OSR approach in their training and continue to practice in the manner in which they were trained. The movement toward open rhinoplasty seems to be plateauing with possibly a slight upward trend in its use. Except for “simple” cases, OSR may be indicated for rhinoplasty by a large proportion of surgeons, especially for rhinoplasties that are “difficult” or revisions or those requiring grafting. It also appears that the more frequently surgeons perform the open approach, the more likely they will use it more often, that is, they came to like the approach more.

Conclusions

Open septrhinoplasty has been embraced by most oto-laryngologists and facial plastic surgeons over the past 20 years in North America. It has been found useful for most indications except for the “simple” tip or dorsum. Its applications have had an upward trend, but it may now be reaching a plateau. The closed approaches continue to have their proponents, for very good reasons, and appear to be especially useful for the “simple” tip and dorsum. The most experienced surgeons may favor the closed approaches, but even they have initiated notable use of OSR. Perhaps the consensus opinion is best summed up by recognizing the challenging operation that rhinoplasty is and the unique training and experience that each rhinoplasty surgeon has. We recommend that each surgeon initially consider the open approach for a given case, unless the surgeon believes he or she can make the diagnosis and correct the deformities with a closed approach, in which case it can be used. We also recommend that rather than learning and less frequently applying a large number of approaches in one’s armamentarium, a surgeon use as small a number of approaches as necessary and use them more frequently to achieve good results within one’s experience. In this way, a surgeon increases his or her experience and becomes maximally adept at each.

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