

A Modified Closed-Open Approach as Part of a Graduated and Integrative Approach to Rhinoplasty

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Abstract

Keywords

- modified closed-open approach
- open and closed approaches
- rhinoplasty

Introduction Open versus closed approach in rhinoplasty is a frequently debated topic in aesthetic plastic surgery. Although good results can often be achieved with either technique, both have unique advantages and disadvantages. In this investigation, we present our experiences of a modified closed-open approach that has been applied on 482 complex primary and secondary rhinoplasties. Three representative cases are described in more detail.

Materials and Methods The procedure begins as a closed approach through an intracartilaginous incision allowing cephalic trimming of the lateral crura, dorsal rasping, and/or excision. Patients requiring extensive nasal tip maneuvers are subjected to exposure of the alar cartilage framework through a transcolumellar/limited marginal incision. This provides not only adequate exposure of the alar cartilages but also easy access to the septum.

Conclusion In our hands, this approach is easy and expeditious. It requires less tip dissection, and therefore may avoid the prolonged postoperative edema that is often a consequence of open or extended closed tip delivery approaches.

Introduction

Rhinoplasty is one of the most common surgical procedures in aesthetic plastic surgery. There has been a vivid debate over the last decades about whether the open or closed approach should be used for optimal results.^{1,2} Various open and closed techniques have been described, with all having the goal to obtain reliable and long-term results with as little surgery as possible.³ Less surgery causes less soft-tissue trauma, ecchymosis, and postoperative swelling that, taken together, may shorten the recovery period.⁴ However, limited surgery may also hamper the exposure and cause technical problems and undesirable results.

This article describes a modified closed-open approach. In our opinion, the best candidates for this approach are selected primary or secondary cases who would benefit from the limited dissection of the closed approach but require the better exposure offered by the open approach.

Materials and Methods

We have applied the modified closed-open technique to 482 patients, 334 women, and 148 men. They ranged in age between 18 and 59 years (mean 34). They were all healthy without any medication. None had a body mass index > 30. A total of 37 cases were secondary. Inclusion criteria were cases requiring substantial tip modification as the closed approach alone does not appear to be conducive to the whole gamut of tip-plasty maneuver, such as shaping and positioning of the tip with suture techniques, placement of precise tip grafts, septal extension grafts, and columellar struts. In our opinion, the modified closed-open approach is preferential in such cases as it avoids unnecessary skeletonization, and yet allows undistorted visualization of the structures to be manipulated. This article presents three representative cases of the technique.

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Surgical Technique

Closed Approach

All patients are operated under general anesthesia. The surgical procedure begins by making an intracartilaginous incision as shown in ►Fig. 1. Care is taken not to continue the incision too far, medially leaving 4 to 5 mm of intact mucosa between the medial end of the intracartilaginous incision and the septal mucosa. This leaves the mucosa of the internal valve area undisturbed. Through this access, cephalic trimming is performed as necessary followed by maneuver addressing the nasal dorsum. With the overlying skin and soft-tissue envelope in the anatomic position, progressive sculpting of the nose can easily be performed. There is no need for dissection more than the area to be surgically modified. Continuous visual assessment of the changing aesthetics of the nose is possible without having to redrape the skin over the nose each time.

Open Approach

The surgery continues with nasal tip exposure. As illustrated in ►Fig. 1, a transcolumellar incision is continued as a limited marginal incision just past the soft triangle. This leaves most of the alar rim uninterrupted and secures a broad base for the venous and lymphatic drainage of nasal tip skin sleeve, especially toward the lateral aspect, where the principal venous and lymphatic drainage is found.⁵ Preservation of this vascular and lymphatic connection is paramount. It is this critical aspect of the technique that differentiates it from the traditional open approach and in our belief affords less nasal tip swelling. Some ligamentous connections in the cranial part of the nasal tip are also preserved maintaining some tip support. Through this conservative exposure technique, tip modification maneuver—sutures or grafts—can be performed expeditiously with the cartilages in resting anatomic position as in the open approach. Moreover, most septal deformities can be addressed under direct vision without having to resort to transfixion incisions, thus preserving a fully intact septal mucoperichondrium and mucosa. If

indicated, osteotomies can be performed and dorsum adjustments can be made at any time during the procedure.

Clinical Cases

Case 1

A 24-year-old woman, who previously had had open rhinoplasty, presented with an over-resected nasal dorsum with visible contour irregularities, a wide nasal base and an over-rotated nasal tip (labiocolumellar angle = 115°). External valve collapse and complex intranasal scarring caused breathing problems. Diced conchal cartilage wrapped in deep temporalis fascia was introduced through the endonasal approach after limited undermining of the nasal dorsum. Lateral percutaneous low-to-low osteotomies were then performed. Tip exposure allowed precise placement of tip sutures, a columellar strut graft, and a septal extension graft using septal cartilage. Alar rim grafts fashioned from the remaining conchal cartilage were inserted to correct the external valve collapse. The internal scar tissue was excised, and adjacent mucosa was rearranged to improve the nasal airway. Finally, the nasal base was narrowed by excision of small wedges from both nostrils. Comparison of the preoperative (►Fig. 2, left) and 12-month postoperative (►Fig. 2, right) views demonstrates the correction of the nasal dorsum with creation of pleasing dorsal aesthetic lines, derotation of the nasal tip, resolution of the alar collapse, and narrowing of the nasal base.

Case 2

A 22-year-old woman complained of a deviated nose, dorsal hump, asymmetric bifid tip and subtle breathing difficulties. The dorsal hump was addressed through the closed approach. Then, the open part of the approach allowed repositioning of the septum to the midline and fixation to the nasal spine caudally. Percutaneous low-to-low osteotomies were followed by placement of a columellar strut graft to stabilize both the tip and septum. Finally, the tip was refined with precise

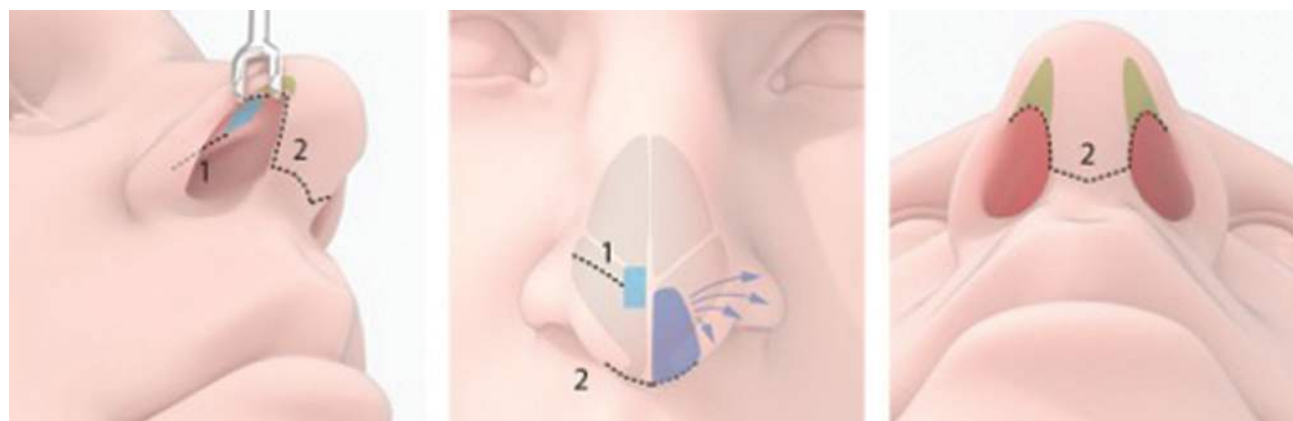


Fig. 1 Left: The position and extent of the intracartilaginous and transcolumellar/limited marginal incisions are depicted. The alar margin is retracted to highlight that the internal valve (blue strip) is not violated by the intracartilaginous incision. The marginal incision is limited to just past the soft triangle (green). Center: Again, the intact internal nasal valve (light blue) is shown. The intact middle and lateral alar rim allows for extended drainage (arrows) of the tip (dark blue). Right: Basilar view demonstrating the position and extent of the transcolumellar/limited marginal incision in relation to the soft triangle (green).



Fig. 2 Pre- and postoperative views of the patient in case 1.

transdomal suturing under direct vision. Comparison of the preoperative (►Fig. 3, left) and 12-month postoperative (►Fig. 3, right) views reveals correction of the nasal deviation with establishment of pleasing dorsal aesthetic lines and improved nasal tip projection/rotation.

Case 3

A 29-year-old man complained of a crooked nose. Preoperative analysis (►Fig. 4, left) showed a long nose with distorted dorsal aesthetic lines, a wide tip with poor support,

a large infratip lobule, and an acute labiocolumellar angle. Starting with the closed approach, dorsal hump reduction and cephalic trimming were performed. Percutaneous low-to-low osteotomies were completed before tip exposure. The nose was shortened with the help of spanning sutures, while the tip was supported with a columellar strut graft and covered with a morcellated conchal shield graft. Comparison of the preoperative (►Fig. 4, left) and 12-month postoperative (►Fig. 4, right) views demonstrates correction of the dorsal aesthetic lines and a balanced nasal profile.

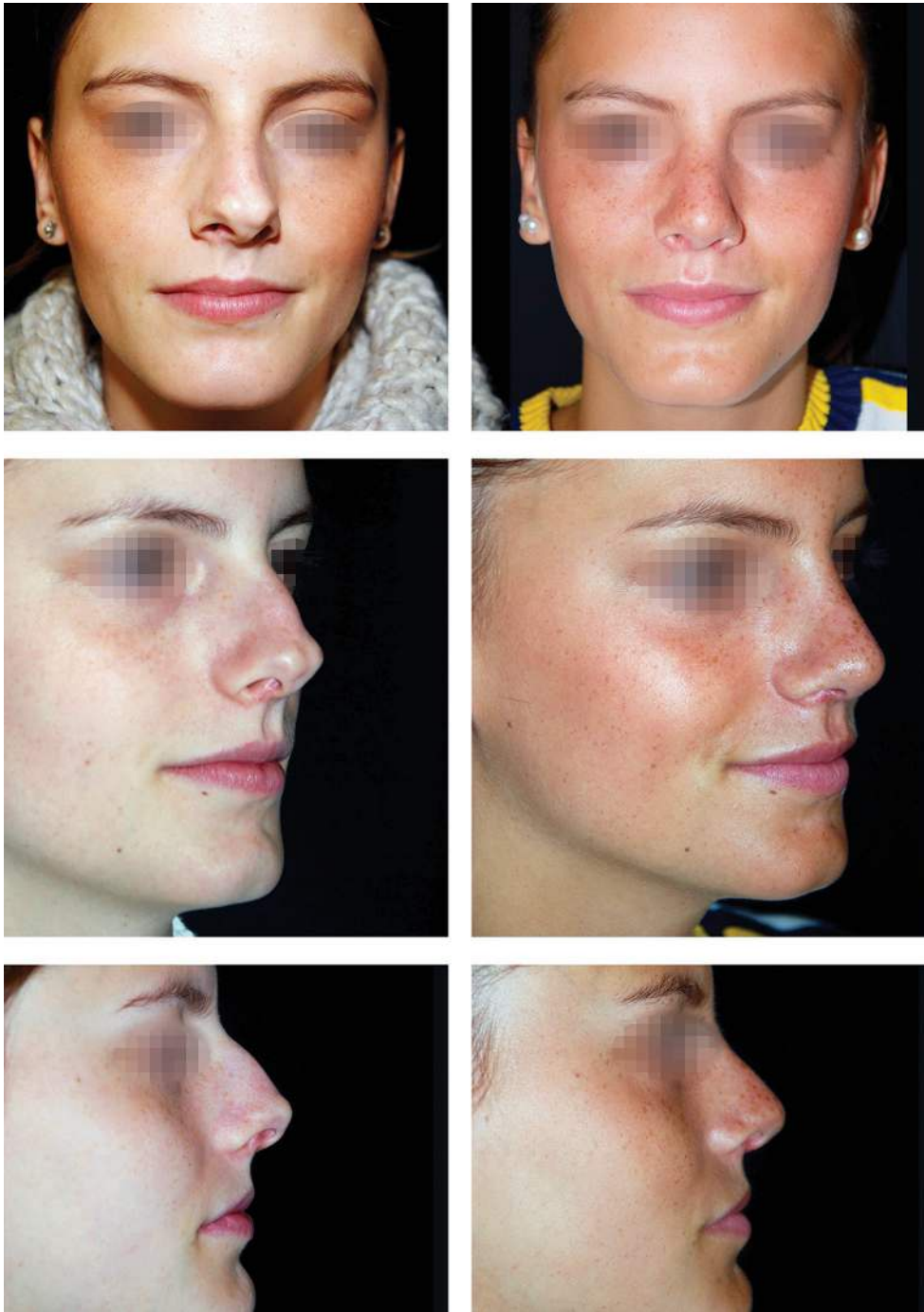


Fig. 3 Pre- and postoperative views of the patient in case 2.

Discussion

Rhinoplasty is undeniably a challenging and complicated surgical procedure with many steps and factors to consider. Small alterations lead to significant changes in the interplay of the tissue components. With so many variables to take into account, most surgeons become familiar with just one technical approach during their training⁶⁻⁸ and feel comfortable to continue with that approach during their career. However, a specific approach is not a panacea for all problems encountered in rhinoplasty. Thus, although distinguished masters can attain and have published exceptional results

with either one of the approaches, unselective application of this “one-approach-fits-all” philosophy does not serve the best interest of each patient and surgeon. An antithesis to this philosophy is the graduated approach.^{8,9} Each patient is individually assessed and allocated to the appropriate access based on the presenting anatomy, the patient’s desires, and aesthetic goals. It allows the surgeon to have an open mind without being obsessed about avoiding the transcolumellar scar at any cost or dissecting widely no matter what. Instead, the emphasis is on achieving the preoperatively defined goals in the simplest, most efficient way while minimizing the extent of dissection and maintaining or fortifying structural



Fig. 4 Pre- and postoperative views of the patient in case 3.

support. The selected access is not a guarantee of a successful outcome. Preoperative clinical assessment, detailed operative planning, the surgeon's experience and dexterity, selection of appropriate maneuver, and careful execution of them are as important.^{8,10}

A central pillar of our graduated approach to rhinoplasty is tailoring the extent of dissection to provide optimum exposure for the selected maneuver while avoiding unnecessary soft-tissue manipulation. The planned maneuver determines the access and amount of dissection. Noses with reasonable tip symmetry and definition requiring dorsal reduction or augmentation, cephalic trimming, and simple septoplasty

are handled through a closed nondelivery approach with or without hemitransfixion incision. Simple revision cases that can be addressed through isolated maneuver and camouflage grafts are also included in this category.^{2,11} Asymmetric, broad, bifid, over-projected, or under-projected tip and significantly deviated septum are deformities compelling the surgeon to obtain greater exposure either through an extended closed tip delivery or a traditional open approach. Both require extensive dissection. The modified closed-open approach provides adequate exposure for accurate anatomic diagnosis and correction without wide dissection. The dorsal modification is still undertaken through a limited intracartilaginous

incision and dissection. However, the tip is unroofed through a transcolumellar/limited marginal incision. The full scope of tip shaping and positioning maneuver as well as complex septoplasty can be accomplished easily and reliably. This is true for complex revision rhinoplasty, too. Finally, the traditional open approach is reserved for patients requiring extracorporeal septoplasty, and for those being at risk of developing complex midvault deformities. The graduated and integrative approach aims at striking a balance between limited dissection, adequate exposure, and effortless performance of the intended maneuver by integrating both approaches.

Daniel has applied the "closed-open approach" to access the dorsum and septum through an intercartilaginous incision and the tip through a traditional transcolumellar/intracartilaginous incision. We have modified the approach by accessing the dorsum through an intracartilaginous incision instead and avoiding a transfixion incision to maintain an intact mucosal bridge at the internal valve area. In addition, the transcolumellar incision is extended only as a limited marginal incision just past the soft triangle. Having applied this technique in 482 complex primary and secondary rhinoplasties, over the past 10 years, we have noticed that there tends to be a decreased postoperative edema and scar formation when compared with open or extended closed approaches. Adequate measurements making comparisons possible are, however, difficult to find. Some surgeons do not regard postoperative edema as an important complication in rhinoplasty. Yet, it is certainly more than a nuisance for the patient and can last up to a year or even longer in certain cases^{12,13} Edema, fibrosis, and scarring endanger the final aesthetic result by obscuring definition, even if the underlying framework is perfectly shaped. Male patients, those with thick skin and revision cases, are at increased risk of postoperative edema and scarring.^{10,11,14,15} Repeated postoperative visits for reassurance or steroid injections lower patient satisfaction and add to the surgeon's frustration. It is possible that the protracted edema, in most cases, is more related to the extent and plane of dissection than to the frequently blamed columellar incision.¹⁶ The traditional open approach may predispose to dissection beyond what is absolutely necessary.² Unless the midline SMAS/Pitanguy (Superficial Muscular Aponeurotic System) ligament is preserved, the extended closed delivery approach can also cause significant edema due to the extensive and inherent nature of the dissection.¹⁷ Through limited incisions and dissection, and by keeping mucosal bridges and a broad base of central and lateral alar margin undisturbed, the modified closed-open approach may partially avoid this complication. The often-decreased operative time, compared with both open and closed delivery approaches, is an additional bonus. A drawback of the closed-open approach, shared with the open, is the columellar scar. Poorly planned, cut, or reapproximated columellar incisions may lead to depressed and notched scars that may not be obvious in the front view but are easily visible on the profile.^{10,11} Among open rhinoplasty patients presenting for revision, 9 to 25% found the scar objectionable.^{18,19} Nevertheless, properly closed by reapproximation of SMAS to relieve

skin tension and careful repositioning of the lateral edges, the scar can and should be imperceptible.²⁰

Alternative approaches to the traditional inter- or intracartilaginous delivery techniques have been described. They seek to provide wide exposure of nasal tip framework without the transcolumellar incision. The intercartilaginous incision is omitted, while the intracartilaginous incision is extended either medially to the midcolumella/nasal floor^{18,21-23} or laterally past the lateral crus toward the piriform aperture,²⁴ sometimes combined with alar base excisions.²⁵ Even though they do provide exposure of the alar cartilages, some more than others, this is at the expense of more extensive dissection and they all require distortion of the alar cartilages during delivery through one nostril.

Our proposed technique involves maneuver that could be easily performed by a practicing plastic surgeon. However, novice surgeons should first master the tip-plasty maneuver using the traditional, more extensive open approach before attempting to perform these maneuvers through the more limited open approach. In addition, while limited dissection should limit postoperative edema theoretically and this has been our experience anecdotally, the superiority of any approach in rhinoplasty over an alternative one can only be documented with prospective comparative studies. Unfortunately, the logistics of performing a study that compares different rhinoplasty procedures are lacking in the literature. However, a prospective study that documents complication and reoperation rates along with functional and aesthetic outcomes using validated assessment tools is feasible and necessary.

Conclusion

By incorporating the advantages of both open and closed approaches, and circumventing their limitations, the modified closed-open approach is a viable third option for complex cases. This approach should be considered as a hybrid approach bridging the gap between the two well-established ones and is best utilized as a part of a graduated and integrative approach to rhinoplasty that integrates both open and closed techniques.

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Conflicts of Interest

There are no conflicts of interest.

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