

Open septorhinoplasty. Experiences in 200 patients*

H. D. Vuyk, P. Olde Kalter

Department of Otolaryngology, Facial Plastic and Reconstructive Surgery,
Gooi-Noord Hospital, Blaricum, The Netherlands.

SUMMARY

There are two approaches for septorhinoplasty, the endonasal approach and the external approach. The external approach is much criticized for the risk of columellar skin flap necrosis and visible scar formation. This series of patients has shown that the risk can be minimized using a mid-columellar broken incision with a meticulous closure technique. The exposure of the surgical anatomy is much better than with the endonasal approach, leading to better insight in nasal deformities and more detailed reconstruction. There seems to be no reasonable objection which can be raised against the columellar incision to reject the open approach.

Key words: septorhinoplasty, external approach, nasal surgery

INTRODUCTION

There are two approaches for septorhinoplasty (SRP), the endonasal approach and the external approach. Traditionally, the endonasal approach has been taught and used most commonly. The external or open approach has been first described in the European literature by Rhedi (1934) and Sercer (1958). Padovan (1966) has introduced the open approach in the U.S.A. and Canada (Goodman and Charles, 1978a, 1978b; Goodman, 1980, 1981; Anderson et al., 1982, Adamson, 1987; Johnson, 1990). The external approach is, in essence, a 5-mm long transcolumellar incision (connected with two marginal incisions) offering the possibility to lift the skin and soft tissues from the nasal skeleton (decortication). Improvement of the technical aspects of the open approach, such as site and depth of the incision and preservation of the continuity of the medial crura have diminished considerably the risks related to this approach, such as necrosis of the columellar skin flap and visible scar formation.

The disadvantages of the open approach do not seem to outweigh the great advantage of increased exposure, as compared to the endonasal approach. We feel that the open approach for SRP deserves more attention and a wider application.

We describe a series of 200 patients who underwent rhinoplasty, performed by the external approach. Indication, contra-indication, surgical technique and results, as well as complications of the open approach for SRP are described.

Our experience will be put in perspective of the available literature. We will focus particularly on columellar wound healing and scar formation.

INDICATIONS AND CONTRA-INDICATIONS Various indications for open SRP are described in the literature (Goodman and Charles, 1978a, b; Baarsma, 1979; Goodman, 1980; Wright and Kridel, 1981; Anderson et al, 1982; Briant 1985; Stoll, 1986; Adamson, 1987; Gunter and Rohrich, 1987; Kridel and Szachowicz, 1988; Arnstein and Berke, 1989; Zijlker and Vuyk, 1990, 1992e; Vuyk 1992). These authors suggest that the improved exposure of the open approach will facilitate correction of nasal deformities, such as crooked nose, alar collapse, nasal septal perforation, cleft lip nose, and nasal dorsal cyst. We think the indication for open approach depends on the surgeons preference. The open technique may even be used for every rhinoplasty (Anderson et al., 1982; Adamson, 1987; Goodman and Charles, 1978a, b; Johnson, 1990), except those where the surgeon can diagnose all nasal deformities pre-operatively and correct them satisfactorily with the closed approach. In Europe, the open approach does not seem to be used routinely. Only for the cleft-lip nose the open approach is an accepted alternative to the endonasal approach.

TECHNIQUE

We consider pre-operative assessment and planning the basis for every rhinoplasty (Zijlker and Vuyk, 1992a).

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Routine ENT examination and standardized photographic documentation are a prerequisite in this respect. In our practice, computer imaging (Schoenrock, 1990) has enhanced patient-doctor communication to set a realistic goal for surgery.

The open rhinoplasty can be done under local anaesthesia with sedation or general anaesthesia, both on a one-day-care basis. Rhinoplasty may be started with a Killian or hemitransfixion incision. These incisions allow a septoplasty and harvesting of cartilage grafts before the actual rhinoplasty. The hemitransfixion incision lies in, and the Killian incision behind, the membranous septum. Both incisions are not in continuity with the incisions for the open approach. Using a hemitransfixion in combination with the open approach, the fibrous attachments between the medial crurae can be kept intact, facilitating subsequent placement of a cartilage columellar strut. A Killian incision has the advantage of preservation of the intercrural fibres as well as the attachment of the medial crurae to the septum, aiming to preserve nasal tip support.

Various columellar incisions have been proposed in the literature for the open approach: in the columellar basis, under the lobule and in the midcolumellar region (Figure 1).

The V-shaped incision at the basis of the columella is relatively long and does not parallel the relaxed-skin tension lines. The resultant skin flap is long with a small pedicle. These characteristics may increase the risk of flap necrosis and a visible scar. An incision under the lobule lies in the relaxed-skin tension lines. However, the exposure of the nasal septum and premaxilla is limited. The incision in the midcolumella is small and does parallel the relaxed-skin tension lines. In this region the skin is thin and the ultimate scar is supported by the intact medial crurae. Moreover, the inverted V does break up the wound contraction forces.

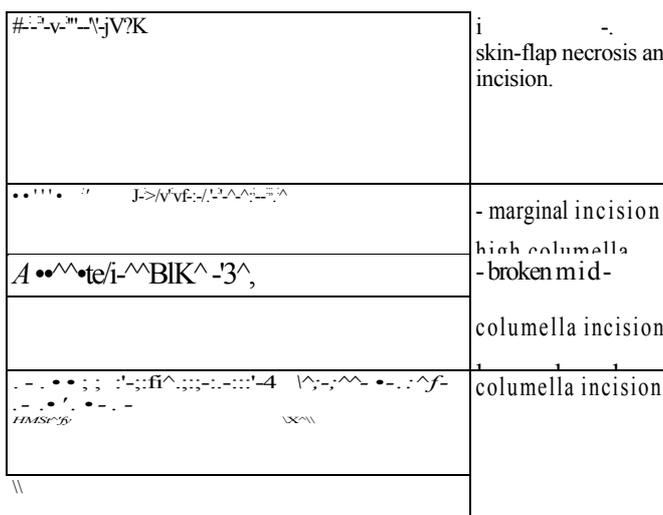


Figure 1. Three different incisions in the columella which can be combined with 2 marginal incisions to lift off the skin and soft tissues from the nasal skeleton. The authors have used the broken midcolumellar incision exclusively.

These characteristics prevent scar retraction as opposed to a simple, straight linear incision. Compared to the incision under the lobule, and in the basis of the columella, the mid-columellar incision lies in a "shadow-zone". One may conclude that for the above-mentioned reasons, the midcolumellar incision is preferred. Table 1 summarizes a few studies of large series on open rhinoplasty with respect to wound healing of the broken mid-columellar incision. Only in 3 out of a total of 986 patients, wound dehiscence has occurred. In retrospect an attempt to elongate the columella has caused too much wound tension, leading to dehiscence. Based on the literature, we have used the mid-columellar incision exclusively to expose the nasal skeleton. The mid-columellar incision is extended to both marginal incisions. The caudal corners of the columellar skin flap are also supported by the intact medial crurae preventing retraction. The columellar skin flap should be raised incorporating the soft tissues over the alar cartilages as possible. The thickness of the flap enhances the viability, while the epi-perichondrial plane is relatively bloodless. Any bleeding vessel can be coagulated with bipolar instruments. The lower lateral cartilages (LLC), upper lateral cartilages (ULC), and the nasal dorsum upto the nasal frontal angle can be exposed, lying undeformed in their anatomical position (Figures 2-4). Division of the intermedial crural ligaments offers extensive exposure down to the premaxillary spine. However, if preservation of the tip-supporting mechanism is necessary, it is preferable to keep the intercrural ligaments intact and use the hemitransfixion for work on the septum and nasal spine. After separating the ULC from the septum, the whole septum, including the nasal valve, can be viewed not only from below (comparable to hemitransfixion exposure) but also from above. This may be advantageous in case of dorsal septal deflection, nasal valve problems and nasal septal perforation. After having achieved wide exposure with the open approach, all rhinoplasty manoeuvres can be performed

Table 1. Survey of the literature focussing on the risk of columella skin-flap necrosis and visible scar formation after open SRP using a broken midcolumellar incision.

authors	patients (N)	columella/ flap	visible skin scar necrosis (revision required)
Goodman and Charles (1978b)	200	3	
Stone (1980)			
Wright and Kridel (1981)	110		
Anderson et al. (1982)	200		
Ezon (1985)	140		
Gunter and Rohrich (1987)	100		
Adamson (1987)	158		
Total	986		

A wound dehiscence occurred in 3 patients with a cleft lip deformity. In retrospect, the wound was probably under too much tension as too much lengthening of the columella was strived for.

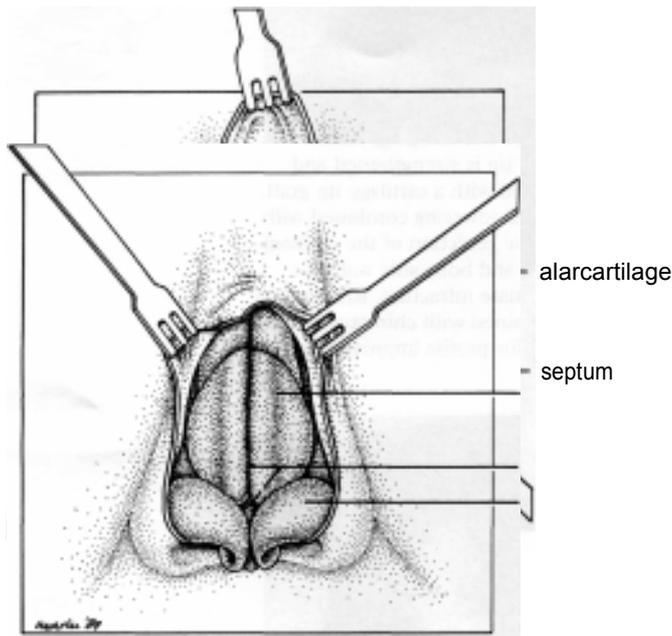
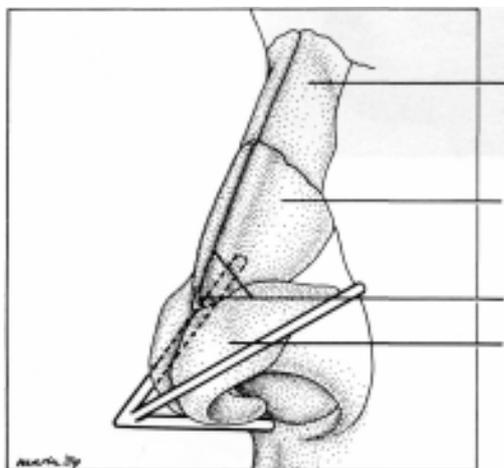


Figure 2. Base view of the alar cartilages and septum after lifting the skin and soft tissue.

upper lateral cartilage
septum alar cartilage

Figure 3. View from above with the lower lateral cartilages, septum and upper lateral cartilages lying in their anatomic position.

bony pyramid
upper lateral cartilage



septum alar cartilage

Figure 4. Three-quarters view of the anatomy of the nose with the tripod model of the lower lateral cartilages depicted.

under binocular vision using both hands. This greatly enhances the surgeon's ability to correct nasal deformities. However, thorough training in rhinoplasty with understanding of rhinoplasty dynamics and surgical skill are necessary to achieve better results.

Alar cartilage modification can be performed most precisely. By applying the tripod concept of Anderson (1984) to lower lateral cartilage modification, tip projection and rotation can be changed in a controlled fashion. Moreover, surgical manoeuvres such as alar cartilage resection, suturing after vertical dome division, fixation of a tip graft (Johnson, 1990; Zylker and Vuyk, 1992b) and/or placement of a columellar strut in between the medial crurae (Anderson, 1984; Anderson and Ries, 1986) are facilitated. Placement of cartilage spreader grafts in between the nasal septum and the upper lateral cartilages is facilitated and can be used with less trepidation. Also, nasal dorsum lowering and augmentation is enhanced by the increased exposure. Dorsal grafts may be carved and fixed *in situ*. The nasofrontal angle may be lowered using a rasp or a drill. Lateral osteotomies are done via lateral vestibular incisions, as in the closed approach.

Before closure, the skin at the junction of the medial part of the marginal incision and the horizontal columellar incision is undermined to prevent trapdoor deformities. Simple 5-0 nylon is used to close the columellar incision precisely. No subcutaneous sutures are necessary. Meticulous care is required in closing wound edges, where they are of an equal thickness. Eversion of skin edges is strived for. Marginal incisions are closed with 5-0 plain gut sutures. The columellar sutures are removed at day 4; the sutures at the junction of the horizontal columellar and vertical marginal incision at day 6 or 7. In case of significant increase of nasal tip projection, it is advisable to prevent too much tension on the closure line by creating an advancement flap of the inferior columella by extending the vertical marginal incisions and undermining the columellar base. In case of significant tip deprojection, there may be a tendency for the redundant columellar skin to form a hanging columella. This 1- or 2-mm excess skin can be excised before closure.

RESULTS

From July 1988 till February 1992 the open approach was used for SRP in 200 patients. Of these, 118 were men and 82 women. The mean age was 36. The mean follow-up period was 10 months, ranging from 2 to 24 months. Thirty-seven patients underwent a revision rhinoplasty. Six of these former operations were done by the author. No columellar skin perforation has occurred as the result of the approach. Two patients had troublesome bleeding during the operation. Both admitted to have taken aspirin type of medication before surgery. The external approach has allowed us to apply various difficult rhinoplasty techniques in a large number of cases. In this respect, the great number of alar cartilage modifications (n =127; 64%), including vertical dome divisions (n=23; 12%), cartilage graft in the columella

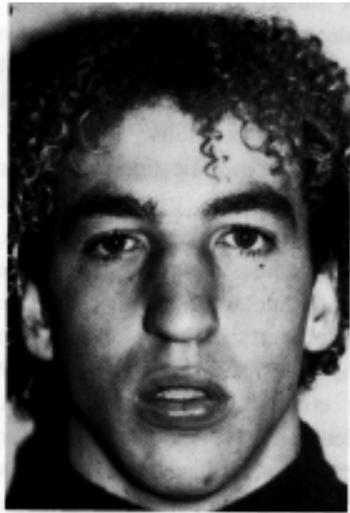


Figure 5a, b, c. Primary rhinoplasty. The hanging, flaccid nasal tip is strengthened and rotated with a cartilage tip graft. Dorsal lowering combined with medial resection of the cartilaginous and bony side walls for adequate infracture. Rhinoplasty combined with chin augmentation for profile improvement.

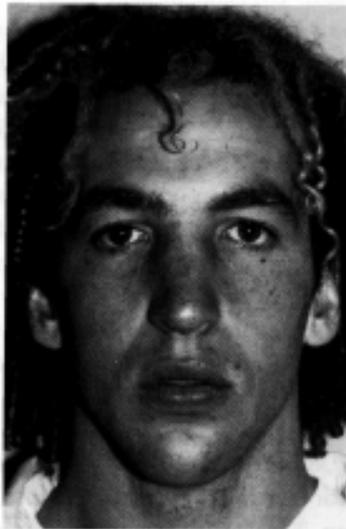


Figure 5d, e, f. One-year post-operative result.

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Figure 6a, b, c. Primary rhinoplasty. Hanging, underrotated boxy tip with slightly deviated nose with relative hump and subluxated nasal septum.



Figure 6d, e, f. Two-years post-operative results.

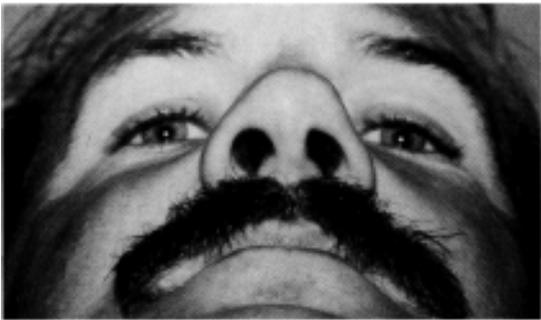
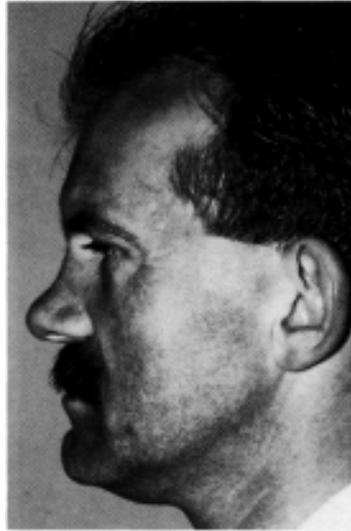
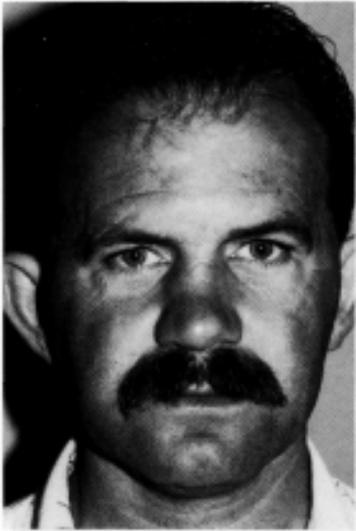


Figure 7a, b, c. Rhinoplasty after nasal trauma. Dorsum augmentation with conchal cartilage together with tip setback and refinement with cartilage tip graft. In-fracture of left nasal bone.

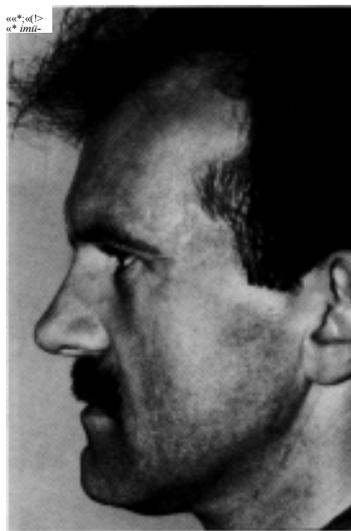
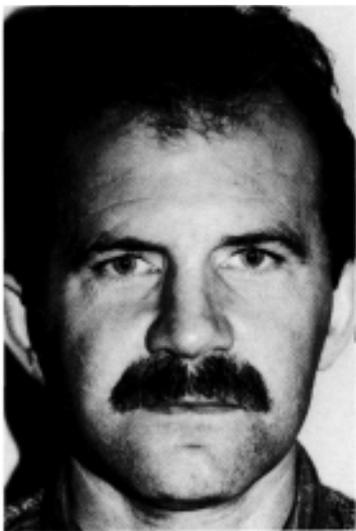


Figure 7d, e, f. One-year post-operative result.

(n =192; 96%) and on the tip (n=60; 30%) and in between the septum and upper lateral cartilages (n=62; 31%) testify to the versatility of the open approach. All three septal perforations, which were included in this series, were closed successfully.

Post-operatively, no columella skin-flap necrosis or wound dehiscence was encountered. All of our patients have accepted the overall inconspicuous scar without any complaints. None of the mid-columellar scars needed revision surgery. The patients were overall satisfied with the aesthetic and functional results. Our revision rate for aesthetic surgery amounts to 3%, for functional problems to 5%, including 5 patients for resection of conchal mucosa only. Figures 5-7 are illustrative for this series.

DISCUSSION

Criticism on the open approach for SRP mainly focuses on the risk of columellar skin-flap necrosis and a visible columellar scar. In this series of 200 patients a broken mid-columellar incision was used. By placing the columellar incision correctly and by leaving the continuity of the medial crurae intact, combined with a meticulous closing technique, columellar skin-flap necrosis and visible scar formation could be prevented. None of our patients complained about the columellar scar, which was considered cosmetically acceptable, obviating the need for columellar scar revision. The vast experience accumulated in the literature, together with this series, show that fear for columella skin-flap necrosis or objectable scar formation is unfounded. We think that the ultimate scar should not influence the choice of the approach for SRP.

In a few patients increased supra-tip swelling was seen in the post-operative phase, as compared to the endonasal technique. This may possibly be caused by the impaired lymph drainage via the columella. However, in this series supra-tip swelling (sometimes needing subdermal corticosteroid injections) does subside in a few weeks to months and, in the long run, does not pose more problems than after the endonasal approach.

The longer operating time has been used as an argument against the open approach. With experience the open approach itself, together with closure of the columellar incision, does not take more than 15-30 min as compared to the endonasal approach. The disadvantage of extra time spent for the approach and closure does largely outweigh the advantage of increased insight in nasal deformities leading to more detailed reconstruction.

This study was not meant to substantiate our feeling that in the patients of this series the results are better than could have been achieved using the endonasal approach. However, the open approach has allowed us to visualize, identify, and correct nasal deformities with a degree of precision, previously available only to the most experienced rhinoplastic surgeons. The surgical manoeuvres are better controlled and, thus, easier to perform. For teaching, the

external approach is much favoured over the endonasal approach for the above-mentioned reasons. Rhinoplasty is one of the most challenging operations in facial plastic surgery because of the large scope of deformities and the great number of techniques to correct them. The approach will depend on the surgeons' own preference. However, there are no reasonable objections which can be raised against the columellar incision to reject the open approach. Of course, the endonasal approach has its merits and its indications for rhinoplasty. However, the endonasal approach with delivery of the lower lateral cartilages, with its distortion of anatomy and partial exposure, is no alternative, given the advantages of the open approach. Based on the experience described in this series and in the literature, the assumption is made that the open approach will become an important part of the modern rhinosurgeon's armamentarium.

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H. D. Vuyk, MD, PhD Dept.
of Otolaryngology, Facial
Plastic
and Reconstructive Surgery,
Gooi-Noord Hospital
Rijksstraatweg 1 NL-1261 AN
Blaricum The Netherlands