The modified open rhinoplasty

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LT Glickman, GW Lee. The modified open rhinoplasty. Can J Plast Surg 1993;1(3):131-136. Despite considerable attention in the past 10 to 20 years, the open rhinoplasty remains a controversial procedure. Advocates of this technique argue that the exposure and thus the surgical manoeuvres it makes are unequalled. Detractors argue that the transcolumellar scar left by the procedure is unacceptable and is most often unnecessary. This report describes a modification of the open rhinoplasty which has most of the advantages of the open approach, but is performed without the external incision. The procedure, its advantages and drawbacks, and comparisons among the modified open, open and closed rhinoplasty are described. It is concluded that the modified open rhinoplasty is an excellent surgical approach that can be used on most patients and that it provides wide exposure without an external incision.

Key Words: *Columella, Modified open rhinoplasty, Perichondrium, Periosteum*

Modification de la rhinoplastie ouverte

RÉSUMÉ : Malgré l'intérêt considérable qu'elle a suscité au cours des dix à vingt dernières années, la rhinoplastie ouverte demeure une intervention controversée. Les tenants de cette technique estiment que la visibilité est meilleure, et par le fait même, que les manoeuvres chirurgicales s'en trouvent facilitées. Ses détracteurs prétendent que la cicatrice transcolumellaire laissée par l'intervention est inacceptable et souvent évitable. Ce rapport décrit une modification à la rhinoplastie ouverte qui s'accompagne de la plupart des avantages de la rhinoplastie ouverte, mais sans incision externe. La technique, ses avantages et ses inconvénients, ainsi que des comparaisons entre la rhinoplastie ouverte modifiée, ouverte et fermée, sont présentés. L'on conclut que la rhinoplastie ouverte modifiée est une excellente approche chirurgicale qui convient dans la plupart des cas et qui permet une grande visibilité, sans recours à une incision.

The subject of open rhinoplasty has received considerable attention over the past 20 years (1-6). Proponents of this technique argue that it provides excellent exposure and allows for precise resection and repositioning of the cartilages and septum. Indications for using this technique include: the difficult tip, secondary rhinoplasty, congenital deformities, the crooked nose, nasal valve dysfunction, septal perforations and surgery on the non-Caucasian nose. Detractors of the open rhinoplasty have argued that it is most often unnecessary because similar results can be achieved by closed methods. A main objection is the external columellar scar which many patients and surgeons find unacceptable.

This report describes the modified open rhinoplasty. This technique has most of the advantages of the open rhinoplasty, but avoids transecting the columella and is thus much more acceptable both to the patient and to the surgeon.

PATIENT SELECTION

All patients are considered candidates for the modified open rhinoplasty except those who require only minor procedures or who have exceptionally difficult deformities that can only be dealt with via an external approach.

SURGICAL TECHNIQUE

The modified open rhinoplasty is performed in four stages:

- stage 1 – exposure and identification of all anatomical distortions
- stage 2 – realignment and modification of dorsal structures
- stage 3 – realignment and modification of the nasal tip and lobule complex
- stage 4 – realignment and modification of skeletal structures.

These stages reflect our way of thinking; they can be applied to any set of nasal problems whether for primary, secondary, traumatic or cleft lip/nose deformities. These four stages are further divided into 15 steps. It must be appreciated that none of the 15 steps of the modified open rhinoplasty are new; they are, in fact, a composite of well-established methods of rhinoplasty. The stages and steps of this procedure are outlined in Table 1.

Stage 1 – Exposure

The incision lines are marked with gentian violet on either side of the columella, beginning at the nasolabial angle and carried forward to connect with the rim or marginal incision. The incision is on vestibular skin above the membranous septum (Figure 1). Very small amounts of local anesthesia (xylocaine 1% with 1:100,000 adrenaline) are infiltrated into

TABLE 1: Stages and steps of the modified open rhinoplasty*

Stage	Step
1	1 Marking the incisions
	2 Infiltration with local anesthesia
	3 Incision
	4 Dissection of entire lower lateral cartilages
	5 Skeletonization of the nasal dorsum
	6 Defatting of lower lateral cartilages
	7 Submucosal dissection and resection of the upper lateral and dorsal septal cartilages
2	8 Hemostasis
	9 Rasping or osteotomy of nasal bones
	10 Septal reconstruction
3	11 Resection and repair of lower lateral cartilage, repair of diastasis, suture of onlay grafts
4	12 Resection of nasal spine
	13 Lateral osteotomy of nasal bones
	14 Closure of incisions
	15 Application of cast

*This sequence of steps provides a framework only. Procedures are carried out only if deemed necessary. Basic surgical and aesthetic principles are strictly adhered to

these areas. After an appropriate lapse of time, the next incision is made with a #15 blade which is carried down through the dermis. Next, using 'baby iris' scissors, the columella is dissected superficial to the medial crura of the lower lateral cartilages and carried upwards to the rim incision. A spread-and-cut technique will undermine the entire lower lateral cartilage. A similar dissection is then carried out on the opposite side. Care must be taken not to avulse or transect the columella, which in effect becomes a bipedicle flap based on both its inferior nasolabial and superior columellar nasal attachments. We facilitate this dissection with the aid of two small double hooks for retraction. If additional exposure is needed, the incision can be carried out further laterally to the level of the alar facial groove, or inferiorly to the nasal spine. Exposure of the dorsum is then carried out by dividing the intercrural ligaments and elevation of the skin from the cartilaginous and bony pyramid superficial to the perichondrium and periosteum. At this point, the entire columella, tip and dorsal skin is mobile and separate from the underlying nasal skeleton.

Stage 2 – Modification of dorsal structures

Next the soft tissue and fat are carefully removed from the lower lateral cartilages which are viewed superiorly, and are still anchored via their mucosal attachments. Trimming of subcutaneous fat can be done at this time if needed. Both lower lateral cartilages can now be brought into full view through the nares by retracting the columellar skin to one side with a skin hook while holding the medial crura with forceps (Figure 2). Exact anatomical deformities or deficiencies can be estimated at this time and appropriate resection or augmentations can be planned. We do not resect the lower lateral cartilages at this time, however. In the evolution of this procedure, we have found that the refinements of the lower

Figure 1) Marking the incisions. Arrow Extension of the rim incision along the vestibular skin under the columella

lateral and tip areas can be disrupted with the subsequent dorsal septal and upper lateral cartilage work. We therefore proceed with the dorsal manoeuvres first and then return to the lower lateral cartilage and tip before fracturing the nasal bones. The lower lateral cartilages based on the posterior mucosal attachments can be retracted downwards providing excellent exposure of the upper lateral cartilages and dorsal septum. Submucosal dissections of the upper lateral cartilage and septum are carried out, and the upper lateral cartilages are separated from the septum under direct vision with the aid of the Aufrecht retractor and a #11 blade. Resections of these structures are carried out if required at this time.

The area is then inspected bilaterally for hemostasis. There are often blood vessels on either side of the lateral crura and in the midline junction of the septum and upper lateral cartilages. These bleeding points can be cauterized under direct vision.

If a septoplasty is to be done, or when the nose is to be shortened or the columellar labial angle changed, a hemitransfixion is made. Care is taken so as not to disrupt the

Figure 2) Dissection and complete exposure of the lower lateral cartilages

Figure 3) Precise anatomical manoeuvres of nasal tip-lobule complex including correction of bifidity and suturing of grafts

Figure 4) Modified open rhinoplasty—for use in primary rhinoplasty. Preoperatively—Upper left, centre and right; Postoperatively—Lower left, centre and right

posterior attachments of the medial crura to the membranous septum. Subperichondrial flaps are elevated on both sides of the septum. The caudal septum can be exposed bilaterally down to the nasal spine and is easily excised, morselized or scored.

Attention is then directed towards the nasal bones which can be visualized to some degree. The bones are rasped in the usual fashion. Occasionally, large dorsal humps are excised with the aid of an osteotome.

Stage 3 – Modification of nasal tip

The next step in the modified open rhinoplasty is to correct and refine the nasal tip area. The columella is retracted laterally and both lower lateral cartilages are brought up to full view. There is some degree of distortion in the contra-

lateral cartilage because of retraction, but this does not pose a problem because of the ease with which it can be dropped into and out of its resting anatomical position. Herein lies the main difference in exposure between this and the open rhinoplasty technique; one which is small enough, however, to pose no problem for the surgeon. At this point, the area of cartilage to be excised is marked with gentian violet. Local anesthesia is used to hydrodissect the cartilage and facilitate excision and prevent incising through the vestibular skin. A segment of the cephalic portion of the lateral crus is resected. Occasionally a vertical segment of cartilage is excised from the convex portion of the lateral crus, and the cartilage is then repaired using #6-0 Dexon. The lateral crura thus repaired lies in a straighter position and will give the basal view a triangular appearance. This manoeuvre has been described

Figure 5 Modified open rhinoplasty – for use in secondary rhinoplasty. Preoperatively – Upper left, centre and right; Postoperatively – Lower left, centre and right

previously in open techniques (6) and is easily accomplished with the modified open rhinoplasty.

We now concentrate on the tip and suture the medial crura together with #6-0 Dexon. This eliminates any bifidity of the tip and enhances tip projection. Abnormal or excessive curves of the medial crura can also be trimmed or scored for symmetry at this time (Figure 3).

Next, the domes of the lower lateral cartilages and the medial aspect of the lateral crus can be scored. If a septoplasty has been performed or if the relationship of the tip to the septum needs adjustment, the medial crura can be sutured to the septum. This is done by placing several horizontal mattress sutures of #6-0 Dexon through the medial crura and the septum just below the level of the membranous septum.

Should a tip, infratip/columella or supratip graft be neces-

sary, it is performed at this time and is sutured directly in place. Thus the relationships of tip, lobule and columella are adjusted precisely. Unlike the open rhinoplasty where there is some difficulty in assessing dorsal profile, in the modified open technique, the columellar and skin envelope is intact and profiles are more precisely evaluated. Also, the so-called 'feel' of the dorsum is unchanged in the modified technique because the skin tautness remains unaltered.

Stage 4 – Modification of skeletal structures

Lateral osteotomies are performed in a standard fashion after local anesthesia is infiltrated along the piriform aperture and the nasomaxillary groove. Stab incisions are made below the inferior turbinates to allow passage of a 4 mm straight osteotome. Usually, a low-to-low osteotomy is carried out

TABLE 2: Comparison of modified open, open and closed rhinoplasty techniques

	Modified open	Open	Closed
Anatomical evaluation of intranasal structures	Yes	Yes	No
Finesse modifications of lower lateral cartilages and septum	Yes	Yes	No
Direct suture of cartilage and grafts	Yes	Yes	No
Direct hemostasis	Yes	Yes	No
External scar	No	Yes	No
Intraoperative disruption of profile	No	Yes	No
Prolonged tip swelling	No	Yes	No
Tip graft under tension	No	Yes	No

and medial osteotomies are done only if necessary. Transverse osteotomies are performed with digital pressure and the nasal bones are infractured.

Finally, the closure is then carried out with the marginal and columellar incisions being approximated with #6-0 Dexon suture. Septal splints are used if septal reconstruction has been performed. Steri-Strips are placed over the tip and dorsum and an Aquaplast splint is then fashioned over the nasal bones. Bacitracin-impregnated gauze is loosely placed in the vestibules to facilitate healing and hemostasis. The patients are instructed to keep their heads elevated for the next 72 h and the cast is removed in seven days. Figures 4 and 5 illustrate pre- and postoperative cases where the modified open rhinoplasty was used for both primary and secondary rhinoplasties.

DISCUSSION

As outlined in Table 2, the advantages of the modified open rhinoplasty are similar to those of open rhinoplasty. Both techniques allow the surgeon to perform intricate anatomical manoeuvres on the cartilage and septum, and to suture cartilage and grafts directly. These techniques are, therefore, highly desirable, especially in a difficult nose. Proponents of the open rhinoplasty would argue that the exposure is superior in their technique because the entire columellar tip skin is retracted cephalad. We argue that this small gain in exposure does not outweigh the disadvantages which include the external scar, the difficulty in assessing the dorsal profile and the prolonged tip induration.

Adamson (5) has said that the open rhinoplasty is indicated in all patients, unless an accurate preoperative diagnosis of the nasal deformities can be made or the surgeon believes he or she can obtain the same results with a closed

approach. Gruber's (6) contraindications for open rhinoplasty are: when a tip graft is going to be under tension as in a small or Filipino nose; or if the deformity to be corrected is a minor one. In the modified open technique, the columella is intact and, therefore, it can accommodate the stresses of a graft in a small nose. Daniel (4) uses the open technique only for 7% of his rhinoplasties. These include those with significant tip asymmetries, complicated secondary cases and twisted noses with osseocartilaginous deviations. We have used the modified open rhinoplasty in all of our previous 30 cases. We have been very satisfied with the results and have had no major complications (Figures 4 and 5). The dissection takes some time and must be meticulous to preserve the columella and expose the lateral and medial crus of both the lower lateral cartilages. The procedure takes longer than closed techniques because of the dissection and cartilage sculpting, but we feel that the results justify the extra time and effort.

The modified open rhinoplasty is really an open technique, but without the transcolumellar scar and the problems of intraoperative dorsal profile assessment and postoperative prolonged tip induration. One might want to call this technique a 'modified closed rhinoplasty' or perhaps an 'extended marginal incision rhinoplasty', but because the approach allows for more complete visualization of the lower lateral, upper lateral and septal cartilages than are obtainable in any closed procedure, we prefer to consider it a modification of the open rhinoplasty technique.

SUMMARY

With few exceptions, all patients are considered good candidates for the modified open rhinoplasty. A four-stage, 15-step operative technique is discussed whereby the lower lateral, upper lateral and septal cartilages are exposed, the bony pyramid is reshaped, and the nasal tip and columellar areas are remodelled. Accurate anatomical manoeuvres are employed. The distinct advantage of this approach over the open rhinoplasty is a lack of a columellar incision which is often unacceptable for both the patient and the surgeon.

REFERENCES

1. Goodman WS, Charbonneau PA. External approach to rhinoplasty. *Laryngoscop* 1974;84:2195.
2. Goodman WS, Charles DA. Technique of external rhinoplasty. *Can J Otolaryngol* 1978;7:13.
3. Fenton RS. External septorhinoplasty - Why the fuss? *J Otolaryngol* 1978;7:3.
4. Regnault P, Daniel RK. Septorhinoplasty. In: Regnault P, Daniel RK, eds. *Aesthetic Plastic Surgery*. Boston: Little, Brown, 1984:101.
5. Adamson PA. Open rhinoplasty. *Otolaryng Clin NA* 1987;20:837.
6. Gruber RP. Open rhinoplasty. *Clin Plast Surg* 1988;15:95.