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Columellar Lengthening in Primary and Secondary Rhinoplasty for Binder's Syndrome: A Fresh Perspective

Kapil Agrawal[1] Raghav Shrotriya[1]

[1] Department of Plastic Surgery, Seth GS Medical College and KEM Hospital, Mumbai, Maharashtra, India

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Address for correspondence Raghav Shrotriya, MS, MCh, Department of Plastic Surgery, Seth GS Medical College and KEM Hospital, Mumbai 400012, Maharashtra, India (e-mail: drkapilps@gmail.com).

Abstract

Binder's syndrome is a developmental disorder with a short columella and nasal base flaring among the many features that have been described. Since the nose occupies the central position over the face, these features appear as a major cosmetic deformity for which patients seek correction. Traditionally various designs of V–Y advancement flap from the upper lip have been described, but they are not without problems. In this article, the authors have discussed a novel design that can mitigate those problems and also described a method of providing additional vascular safety in case of secondary rhinoplasty.

Keywords
- rhinoplasty
- plastic surgery
- binder syndrome
- columellar reconstruction
- short columella

Introduction

Maxillonasal dysplasia, also known as Binder's syndrome, is a developmental disorder characterized by underdevelopment of midfacial skeleton. Described in 1962 by Binder as maxillonasal dysostosis,[1] a prominent finding is abnormally short columella secondary to anterior nasal spine agenesis, hypoplastic maxilla, a defect in the underlying orbicularis oris muscle, atrophy of the nasal mucosa, and absence or underdevelopment of frontal sinus.[2]

Columella is an important part of the nose. Though prima facie it exists in shadow of the nose, it adds to the projection and overall aesthetic appeal of the nose. Any deficiency thereof is very obvious and its rectification becomes very important. Many different techniques have been described for columellar lengthening. It has been the authors' experience that after lengthening the short nose, the neocolumella (increase in length by standard V–Y advancement) falls short in the third dimension (posteriorly, while suturing with the vestibular mucosa) and therefore in this article, the authors describe a technical modification for lengthening of columella with lateral extensions adding tissue in the third dimension, in patients of Binder's syndrome.

Idea

The authors suggest a modification of the V–Y advancement technique wherein lateral wings are taken on both sides of the advancement flap. The columellar part of the alar rim incision is extended laterally (instead of directly extending downwards) on both sides as isosceles triangle keeping the tip along the nasal sill region and the arms not more than 5 mm. The incision is then continued downward into the lip as the "V" flap, the size of which varies as per the requirement of lengthening of columella. ►**Fig. 1** illustrates the design as a schematic diagram.

Sometimes previously operated patients present to the rhinoplasty surgeon who require columellar lengthening procedure in addition to other procedures. Such patient may have a transverse incision over the columella (►**Fig. 2**,

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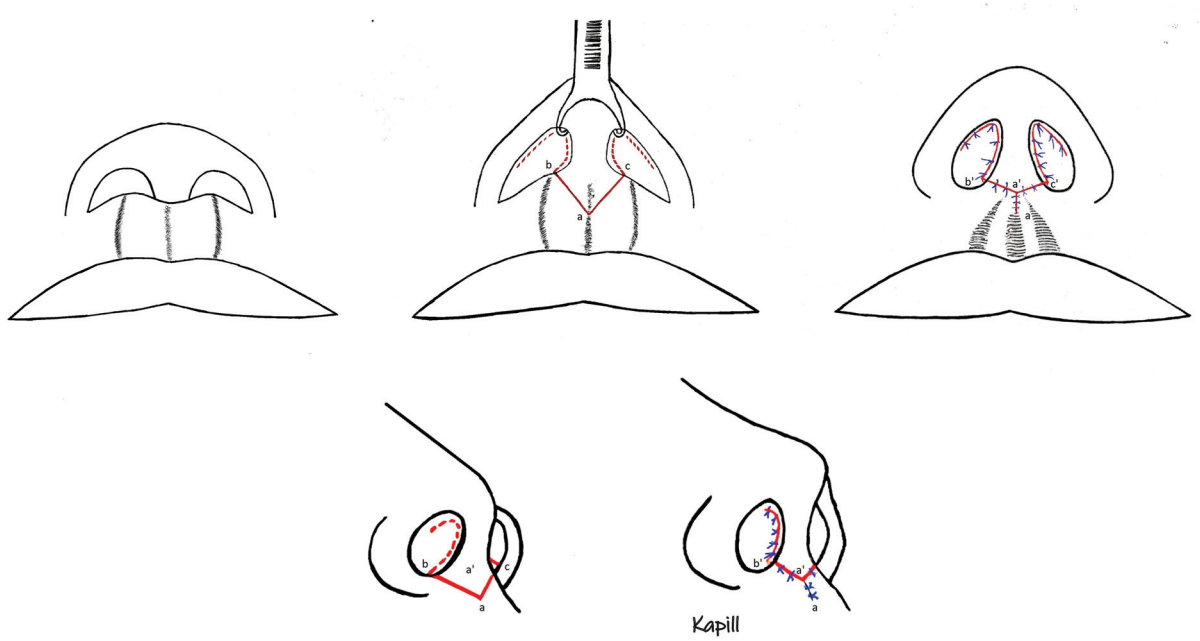

Fig. 1 Schematic diagram of the author's technique. Upper left: Basal view showing columellar shortening along with telescoping due to poor support in a case of Binder's syndrome. Upper middle: Marking of the modified design of advancement flap in basal view. Notice the lateral extensions taken from the nasal sill region (points b and c). Upper right: Final suture line after columellar lengthening (point a advanced to a'; b advanced to b'; c advanced to c'). Notice how the lateral extensions join the incision to cover the region of maximum tissue deficit. Notice also that the philtral columns are reoriented in a naturally pleasing converging pattern. Lower left: Marking of the design shown in oblique view (notice points a, b, and c). Lower right: Final suture line after columellar lengthening in oblique view (a to a'; b advanced to b'; c to c'). Notice the absence of a transverse suture line.

left) owing to the previous surgery and it may not be safe to raise the advancement flap at once. The authors suggest that the flap may be marked and delayed by raising it till the previous incision. This may be done as a minor procedure under local anesthesia, about 1 week prior to the final rhinoplasty procedure (►**Fig. 2**). This minor step provides a great margin of vascular safety for confidently raising the V–Y advancement flap for columellar lengthening even in situations where a previous incision is present.

Discussion

The most common technique of lengthening the columella is to recruit some tissue from the central lip segment by V to Y advancement of a "V"-shaped flap from the area of philtral column. Described in 1833 by Gensoul,[3] this is a useful technique but not without flaws. Few difficulties are faced by the authors during their practice. As the V to Y advancement happens, the lower part of columella falls short in the

Fig. 2 Left: Preoperative basal photograph of a patient of Binder's syndrome with a short columella for secondary surgery. Notice the transverse columellar scar of previous surgery center: Photograph showing the delay of the advancement flap. Right: Postoperative photograph of the patient following columellar lengthening by author's technique after delay of the flap to augment vascular safety.

Fig. 3 Left: Preoperative photograph of a patient of Binder's syndrome with a short columella for primary surgery. Right: Postoperative photograph of columellar lengthening done using the author's technique showing hourglass shape of columella.

transverse dimension as the flap starts converging toward the tip of "V." The natural laxity of nasal mucosa is already used to accommodate the increase in length and height of the nose. This leads to tight closure in the lower part and chances of necrosis as the suturing is done in stretch, difficult closure, possible exposure of the implant or graft, and suboptimal aesthetic outcome in the form of unnaturally narrow columellar base.

Various advantages of the author's technique are:

1. It provides additional tissue in the transverse dimension to cover the columellar strut graft on lateral aspect and helps in closing the incision without tension.
2. It creates a natural aesthetically pleasing columellar broad base (hourglass columella) unlike simple V–Y advancement where base either becomes unnaturally straight or conical. (►**Fig. 3**).
3. This procedure also allows the surgeon to take care of mild-to-moderate amount of nasal flaring since the design of the flap effectively resembles sill excision. As the V–Y advancement happens, 40 to 50% of the deficit at nostril base is replenished by the width of the advancing "V to Y flap" and thus excessive narrowing of nostrils is avoided.
4. The process of delay adds a measure of vascular safety while operating on secondary cases, whereas the flap design remains the same.

The authors have used these technical modifications in 10 patients of primary and 3 of secondary rhinoplasty patients with satisfactory results (►**Figs. 2** and **3**) Though these technical modifications have been described in cases of Binder's syndrome, they may be used for columellar lengthening in any congenital or acquired causes of short columella. The authors have experienced tenuous blood supply in the columella especially in the cases operated earlier. Slight necrosis around the suture line heals with secondary contraction and the advantage of columellar lengthening may be lost in the process. Thus, the authors prefer to use delay which is a well-established technique to improve vascular safety in a flap. In authors' opinion, delaying is an option that is good to have in surgical armamentarium for a rhinoplasty surgeon.

As acute nasolabial angle is a typical feature of Binder's nose, it is pertinent to note that in Binder's syndrome, one of the following two situations is encountered: on clinical examination if the columella is telescoping into the nasal sill, the shortening is apparent and lengthening can be achieved by elevating the tip and also providing support at anterior nasal spine (ANS) through nasal floor augmentation and thorough dissection along the ANS area. In cases where clinical examination reveals true shortening of columella, those are the patients who have tissue deficit in columella and require addition of tissue from the upper lip—in these patients the authors believe their technique will be useful. This technique is recommended only in cases where columella is falling short even after augmenting the ANS and elevating, supporting and lengthening the skeletal element of columella.

The lengthening of columella has been achieved by use of free auricular grafts, flaps from nasal floor, small flaps from upper lip, and V–Y advancement.[4–6] Other methods of shifting nasal skin by external incisions are described for cleft columellar lengthening. It is not acceptable in cases of aesthetic rhinoplasty as done for Binder's syndrome patients.[7] The straight-line lengthening works fine when there is no change in the length of the columella and the vestibular lining does not shift posteriorly.[8] It is important to realize the basic differences in patients of bilateral cleft lip and Binder's syndrome desiring columellar reconstruction. The former is previously scarred due to other surgeries unlike the latter which is completely unscarred and is done as purely aesthetic procedure. Therefore, many techniques described for cleft lip patients may not be best suited for the Binder's syndrome. Thus, we see that the modified design as described in this article not only increases the length of columella but also solves the problems associated with V–Y advancement flap.

Informed Consent
Institutional Ethics Committee clearance has been taken for this study. Informed consent has been taken from the patients involved.

Conflict of Interest
None declared.

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