

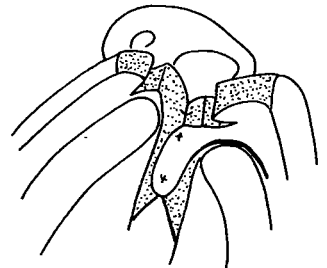
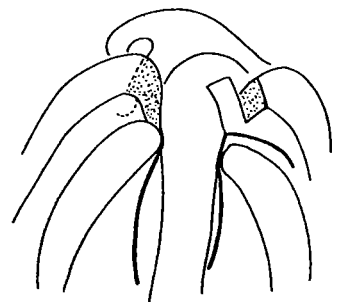
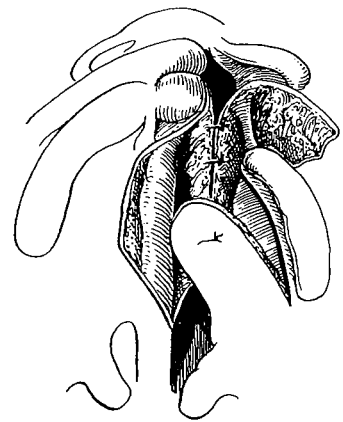
21. Primary Nasal Correction

NASAL FLOOR

THE most opportune time to reconstruct the floor of the nose is, of course, just before the lip is closed when the surgeon has direct access. Veau was the first to develop primary closure of the nasal floor and anterior palate. Ivy in 1934 promoted it in the United States and Kilner popularized it in England to such a degree that it is commonplace today. Waldron set many surgeons at ease when he pointed out that developmental arrests did not occur, for growth centers were not involved in this dissection.

This portion of the cleft closure is achieved with septal mucoperichondrium and mucoperiosteum from the lateral nasal wall. The flap on the septal side is hinged with its base above and is mobilized in continuity with the posterior aspect of the columella. This flap is mattress-sutured to the flap from the lateral nasal wall. Veau's second-layer flap of palatal mucoperiosteum is seldom used today.

Veau's mucosal flaps still serve well for the nasal closure, but several surgeons have described methods of supplying the second layer of mucosa. Burian used a flap from the upper labial sulcus which in the primary lip closure, in my opinion, cannot be spared. T. M. Obukhova described cleft edge mucosa as an adjunct in wide clefts. Ian Muir has been responsible for having surgeons in the West turn to the cleft edge mucosa for a flap to serve as oral covering to the Veau-type nasal floor closure. The advantages of primary nasal floor and anterior palate closure are many and obvious, but most important is the physiological



division of the nasal and oral cavities with suitable mucous membrane which avoids difficult anterior fistulae, reduces maxillary distortion and presents a less awkward palate cleft for later closure.

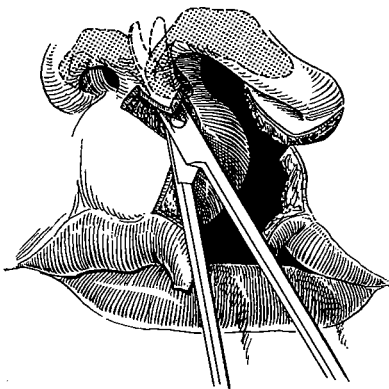
DIFFICULTIES

The width of the cleft may render anterior alveolar cleft closure too difficult. Poor alignment of the alveolar segments is another contraindication as the closure will fix the segments in this malposition and make later orthodontic correction more difficult. The ideal time for nasal floor closure is when the alveolar segments are in near approximation without being in actual contact, provided they are in good alignment, but before the final lip closure. This is probably best achieved by a retainer plate and an early lip adhesion procedure.

COLUMELLAR LENGTHENING

Except for minor provisions of small skin flaps for aid in nasal floor reconstruction, the rotation-advancement principle was the first lip method that simultaneously benefited the nose. The curved rotation incision released the unilateral tethering of the columella as little flap c at first was elevated to create the nostril sill; it is now advanced even higher to lengthen the short side of the columella and to provide cover for the medial half of the nostril sill.

In Bratislava in 1965, Bill Holdsworth and I got into a discussion about the rotation-advancement and, specifically, the unilateral lengthening of the short side of the columella with flap c. He suggested a scissor dissection between the medial crura of the alar cartilages to free the cleft side cartilage so that it can advance upward as flap c is advanced into the columella. I have used this maneuver to some advantage and noticed in his book's fourth edition that he has diagrammed the scissor dissection. Undoubtedly, this is an adjunct not generally used but that may prove of significant value.



ALAR BASE

The greatest economy of tissue shifting for nasal benefit has always been the medial advancement of the lateral lip element, not only to create the missing one-third of lip and bow but also to correct the flaring alar base. This also tends to straighten the slant of the columella and the deviation of the anterior septum. Even when the alar rim has slumped down into the cleft so that the tongue can readily lick it, a crude rotation-advancement set the elements into a position from which they could be revised to refinement.



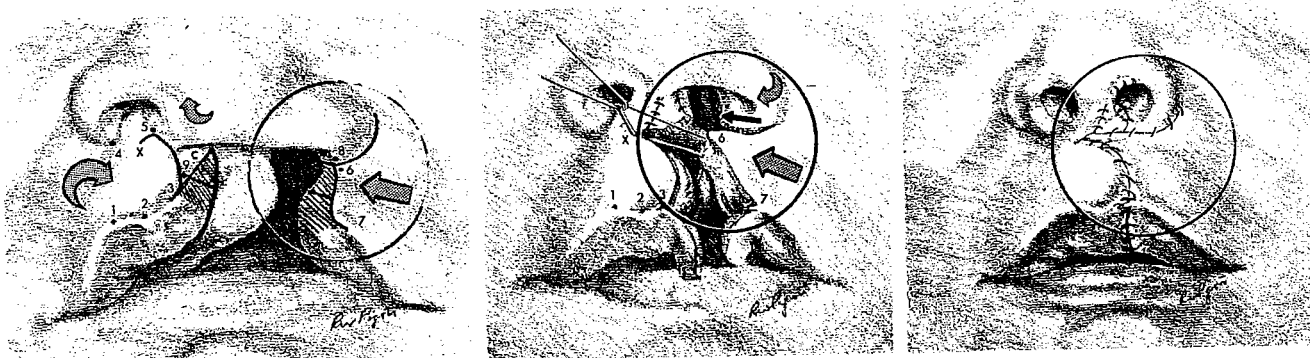
In a number of cases, in spite of the aggressive medial advancement of the upper tip of the lateral flap deep into the rotation gap, the alar position proved to be undercorrected. There was a tendency for the alar base during healing to migrate out and, instead of curling like a court jester's boot around into the sill toward the columella, to turn out splayfooted toward the nasolabial line.

Yet when the alar base is not positioned correctly in relation to the lip advancement flap and to the columella base as compared to its opposite normal alar mate, a secondary transposition is necessary. Such an example is shown in this seven-year follow-up.



a double advancement

A constant repetition of alar creeping prompted a primary extension of the high horizontal incision of varying degrees around the alar base. This not only fed more lip element into the advancement but set the alar base free both to rotate and to advance on top of the advancement flap to meet flap c and complete the nostril sill. This action enables the surgeon to get the alar bases lined up symmetrically, as shown in *Plastic and Reconstructive Surgery*, December 1968.

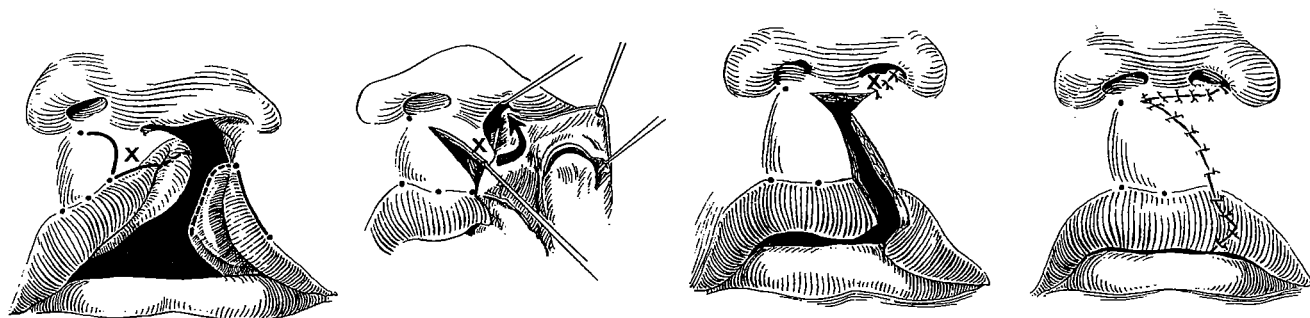


K R U G E R



Eberhard Kruger

Concerned about the raw undersurface of the lateral lip element in the region of the alar base after dissection from the maxilla, Eberhard Kruger of the University of Bonn, Germany, modified the use of flap c of the rotation-advancement method. At the Melbourne Congress in 1971 he described retaining the rotation of the medial element and using a large flap C, which he marks X and transposes as a Z-plasty of the nasal opening. This larger flap C(X) is introduced further posteriorly than my original flap c, which formed the nostril sill. Kruger sutures his X to the anterior base of the lower turbinate to complete the lateral nasal lining as well as the nostril floor.



This modification reverts to the crude early rotation-advance-ment design and thus loses some of the later refinements such as columella lengthening and less obliquity of the lip scar. It does bring out the need for coverage of the raw area in the lateral nasal vestibule.

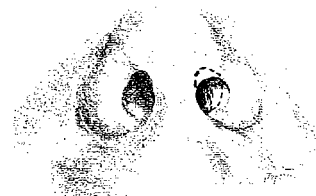
Recently, I have been using an even more satisfactory solution to the problem. In the spirit of Mir y Mir and Muir, the vermillion paring of the lateral cleft edge is left attached superiorly to the alveolus. After radical freeing of the alar base from the maxilla, this mucosal flap is transposed into the raw area to maintain alar base freedom and reduce subsequent retraction.

Then, denudation of the epithelium of the tip of the alar base flap will enable it to be pulled under flap c and sutured to the septum at the nasal spine for permanent fixation in symmetry with the normal side. This will all be described in Chapter 37.

ALAR WEB

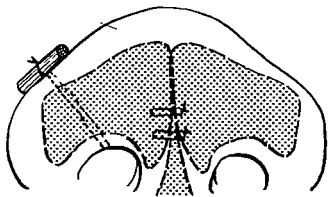
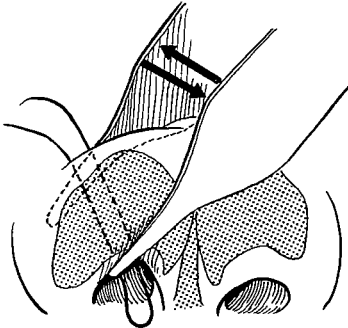
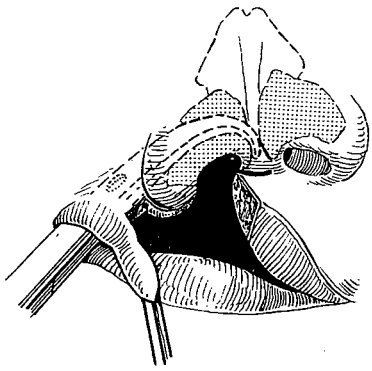
In most cases, a satisfactory nasal result for childhood has been achieved by symmetrizing the alar arches with the excision of the alar web in the form of a crescent skin excision.

If, as in some cases, there was a moderate excess of vestibular lining which buckled into a fold just proximal to the rim within the nostril, this was reduced as a V wedge excision of mucosa in continuity with the skin crescent, resulting as a T closure with improvement of the patency of the airway. This approach is not used any more. The inside fold is formed of cartilage in abnormal position and is not excess mucosa. When the alar cartilage is elevated with a lifting procedure either primarily or secondarily, the buckling smooths out, relieving the obstruction.



WYNN ROUNDS IT

Wynn evidently has more faith in the old Blair-Brown alar cartilage undermining and mattress suture technique than most



of us, as he has resurrected it, adding a modern touch, and called it the "round nostril" technique. He uses a right-angled scissors through his lip-freeing lateral buccal sulcus incision to dissect the skin from the entire alar cartilage on the cleft side, coming out at the transverse incision at the columella base. He then rolls the skin under the alar rim, sliding the cartilage up and back and fixing the new position with through-and-through sutures tied externally. He also sutures the cleft alar cartilage up to the normal cartilage with 4-0 catgut. It is more the release of the short side columella and the advancement of the alar base that achieve the major nasal correction.

REALIGNING THE LINING

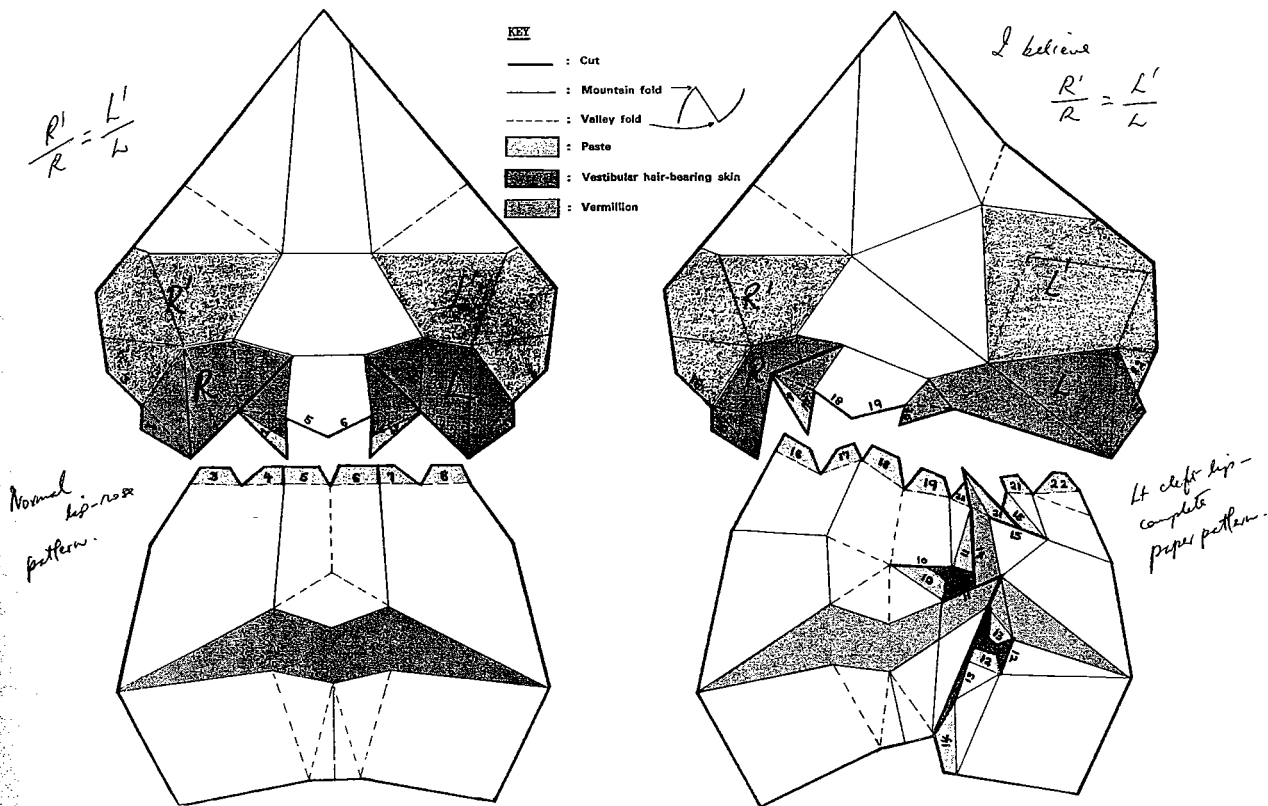
The fascinating work of Boo-Chai and Tange in 1970 with origami paper models seems to offer a strong argument for the freeing of the nasal skin from the underlying cartilage and mucosa of the cleft side. From their models they made certain observations:

1. There is very little difference between the perimeter of the nostril of the cleft and non-cleft side.
2. The ala and, more so, its hair-bearing vestibular skin on the cleft side appear to be stretched.

In 1972 Boo-Chai wrote to me concerning the fold blocking the nasal airway in many cases of repair:

Berkelley "likes a Z" primarily

Surgeons have noted this without attempting to explain the underlying cause. In the adult, Uchida of Tokyo uses multiple "Z." In my opinion this is due to the inner vestibular skin being stretched more than the overlying alar skin, especially in very wide complete clefts of the lip and palate. In one of your refinements you separate the ala into two layers by sharp dissection and re-align the inner hairbearing skin layer. I think this separation gives the vestibular skin a chance to shrink and regain its proper surface area relationship with alar skin. The ultimate relationship of alar and vestibular skin is the same as in the opposite side i.e. $R'/R = L'/L$.



Maybe the wide ala undermining of Blair and Brown offered an unsuspected dividend, allowing the lining to shrink and the skin-to-lining relationship to adjust, avoiding intranasal folds. At least “on paper” such seems to be a possibility.

ASYMMETRY OF NASAL TIP

The one remaining nasal flaw has been the asymmetrical flattening of the alar bulge at the nasal tip, depending on the degree of dislocation and inferior positioning of the alar cartilage spanning the cleft. Some lip surgeons like LeMesurier and Denis Browne admitted complete nasal abdication. Many surgeons procrastinated along the mythical line that growth would improve the deformity. Blair and Brown were pioneers in attempting primary nasal alar cartilage correction at the time of lip closure. They advocated wide undermining of the skin from the

cartilage and the use of through-and-through mattress sutures tied over a bolster on the external skin. As far as tip alignment was concerned, the improvement was usually temporary and mediocre.

MORE RADICAL PRIMARY NASAL SURGERY

When Steffensen began using the LeMesurier method in 1945-1946, he adapted to it the cleft lip nose procedure of his preceptor, Ferris Smith. Through an alar incision 2 to 3 mm. within the nostril and carried down the membranous septum, he dissected the skin from the alar cartilage over the tip. Then with scissors hugging the septum, he divided the lateral chondromucosal lining flap from its attachments to the septum along the bridge on the cleft side all the way back to the nasal bone. He then packed the nostril to match the normal side. Having heard that Steffensen tried this primary nasal correction and later gave it up, I was prompted to write a letter of inquiry. His answer arrived in July 1972:

My nasal modification in cleft lip repair was like the method Ferris Smith described. I used it for several years only to learn how difficult it was to do nasal revisions at a later date, if necessary. I then abandoned the procedure and did nothing with the nose at the time of the cleft lip repair.

NASAL CONSERVATISM

Gustav Aufricht of New York, longtime student and assistant to Jacques Joseph of Berlin, for many years emphasized what he wrote in 1946:

The operation to correct skeletal asymmetry of the nose in association with harelip should be deferred to the age of sixteen or seventeen.

In 1972 he reconfirmed his conservative stand:

I have seen too many perfect primary closures of lips and noses in infancy flatten out during adolescence. The more material is available at age 16-17 the better final correction is possible.



Gustav Aufricht

As the great "Gusty" has long been acclaimed *King of Noses*, his stand undoubtedly deterred many from more radical primary nasal surgery.

A FEARLESS SEPTAL SURGEON

For those who quake at the thought of any septal surgery before the nose is fully grown, J. P. Reidy's Hunterian Lecture of 1948 must have come as somewhat of a shock. Yet if anyone can speak with personal authority on the influence of trauma on the septum, it is certainly "Pete" Reidy who boxed and played rugby for Cambridge University, was heavyweight boxing champion and captain of Rugby at the London Hospital and has the nose and ears to prove it.

In a series of 800 septal resections over 25 years, Reidy found no case of diminution of nasal growth as a result of partial or total removal of the septum. In his opinion and experience, preservation of the septal cartilage in children is of less importance than the relief of nasal obstruction. He set the *seventh* year as a reasonable time, which, of course, was contrary to the popular and conservative belief that this type of surgery should be postponed until age 18.

This was the position that Gillies and I took in 1953:

During the primary unilateral lip closure it is quite evident that there is an inherent shortness of nasal lining on the cleft side. The nasal attachments to the cleft must be divided when the lip is dissected off the maldeveloped maxilla before the nose will come forward into a relatively normal position. Even then it is rare to get it perfectly placed for there is some shortness of skin as well. . . . The deflected septum is freed from its vomerine groove, straightened, and held in position by suturing it to the upper edge of the lip muscle from the cleft side. This manoeuvre also positions the alar base and supports the nasal floor. Care in these fundamentals will produce a reasonable nasal result following the primary operation. Undermining the alar cartilages from the overlying skin is an advantage, but the attractive immediate result, while the through-and-through stitches are in position, is deceiving and likely to slip when the sutures come out. The danger of affecting cartilage growth by early surgery seems overshadowed by the fact that deformed cartilage without correction will continue to grow



J. P. Reidy

*This is
difficult
to accept*

*Most will
agree with
this last
sentence*



William Berkeley

deformed. On the whole, nasal corrections are easier when the child is older.

RADICAL PRIMARY TIP CORRECTION

Bill Berkeley of Charlotte, North Carolina, in 1959 made a daring departure from nasal precedent. He said:

Primary repairs of the nose should reach a state much like the lip with no need or prospect for secondary repairs.

In reference to unilateral clefts, he stated his reasons:

The cartilaginous septum is almost always displaced toward the normal side with the lower margin presenting in the normal nostril affording no support to the cleft side of the nose. The nasal spine presents in the floor of the normal nostril. . . . The columella is not in the midline. It is directed away from the cleft side at its base. The alar cartilage on the cleft side is out of balance with its neighbor in all three planes.

The medial crux sits below the opposite medial crux in the columella. The entire cartilage is rotated forward and downward from normal. Because of incomplete rotation of the premaxilla, the nasal spine is lateral to the midline on the unclefted side. The tip of the medial crux rests on the opposite side of the midline adjacent to the nasal spine. The lateral crux is based at the angle of the pyriform sinus lateral to its normal position on the cleft side.

To correct these deformities, Berkeley suggested straightening the septum, resection of the displaced nasal spine and rotation of the cleft side of the nose. Few would argue with this procedure in theory, only with his method of approach.

Access to the area is obtained through a midline vertical columella-nasal-tip incision.

He excuses this external incision by condemning the incision of Rethi and Heinz Gelke as bizarre and deforming. Through his incision Berkeley gains access to the septum with a submucous dissection. Vertical, parallel, partial-thickness scoring on the concave side of the exposed cartilage facilitates its positioning in the midline without rebound action. The spine is resected.

This brings balance to the tip, symmetry to the nostrils and centralization of the columella.

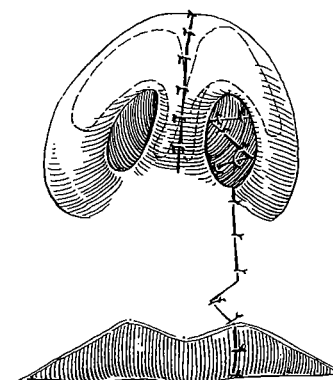
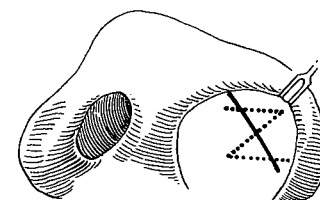
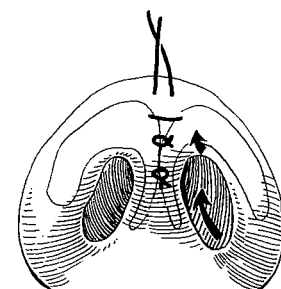
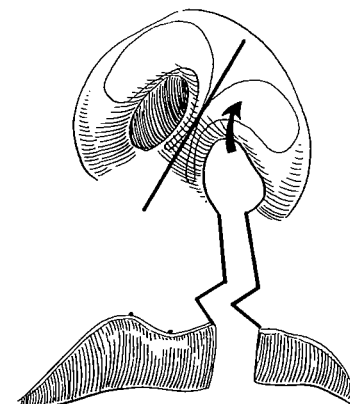
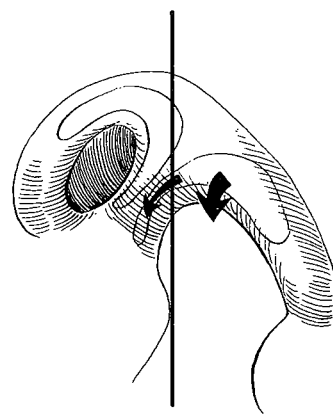
After correction of the septum and resection of the spine, Berkeley then achieves a heminasal rotation.

Through the midline incision the skin and subcutaneous tissues are freed from the underlying cartilages, alar triangular cartilages and lower nasal bones on both sides. The medial crura are separated from each other in the midline. The medial crux on the left side is freed from the side of the nasal spine and the septum to allow for upward glide. . . . Fixation is accomplished by direct horizontal mattress sutures between the two cartilages, using 5-0 chromic catgut.

The inherent shortness of the lateral wall of the vestibule from the nasal tip to the alar base is treated with a Z-plasty by Berkeley. His lateral cheek mobilization is accomplished through the buccal sulcus incision for he does not incise the mucosa widely. He says:

Extending the incision up and around the pyriform margin produces a loss of anchorage of the mucous membrane along the lateral wall of the nasal passage.

This has not been my experience, and wide freeing in severe clefts seems to aid in the closure. It is now 14 years since Berkeley first proposed the primary tip cartilage correction through an external incision, and very few surgeons have dared to follow his lead. The obvious action was to study some of his late results. On the following pages are three cases he kindly sent in 1973 with accompanying labels for our evaluation.

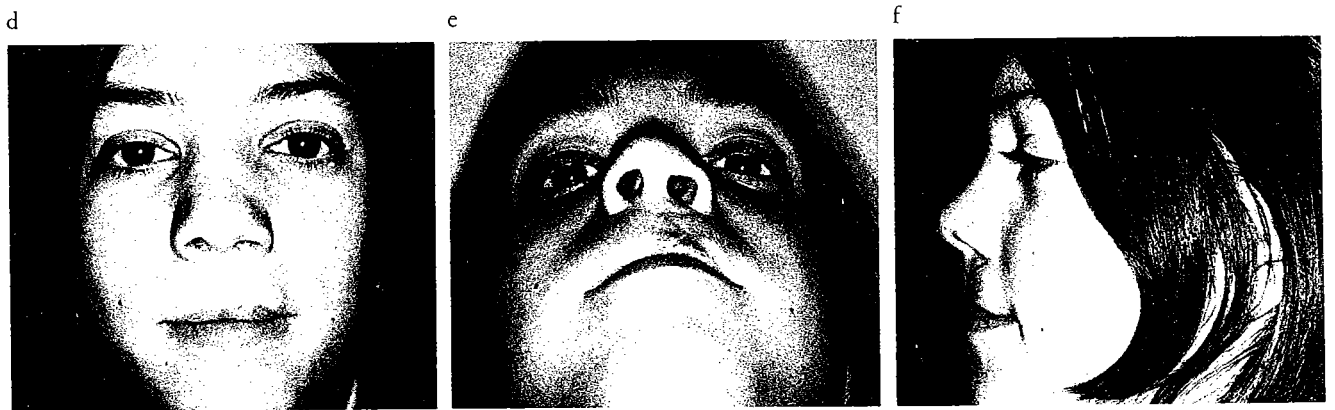


1.

a. Born 12-26-56. *b.* Repair of lip (Tennison), nose (Berkeley) and anterior palate (Veau); local with sedation (Straith) 3-20-57. *c.* Wardill repair of palate and realignment of mucocutaneous-ridge 3-12-58.



d, e and *f.* January 1970; no interim surgery. Revision of lip-nose and straightening of septum contemplated for summer of 1973. This case also presented in *Cleft Lip and Palate* by Grabb, Rosenstein and Bzoch, 1971.



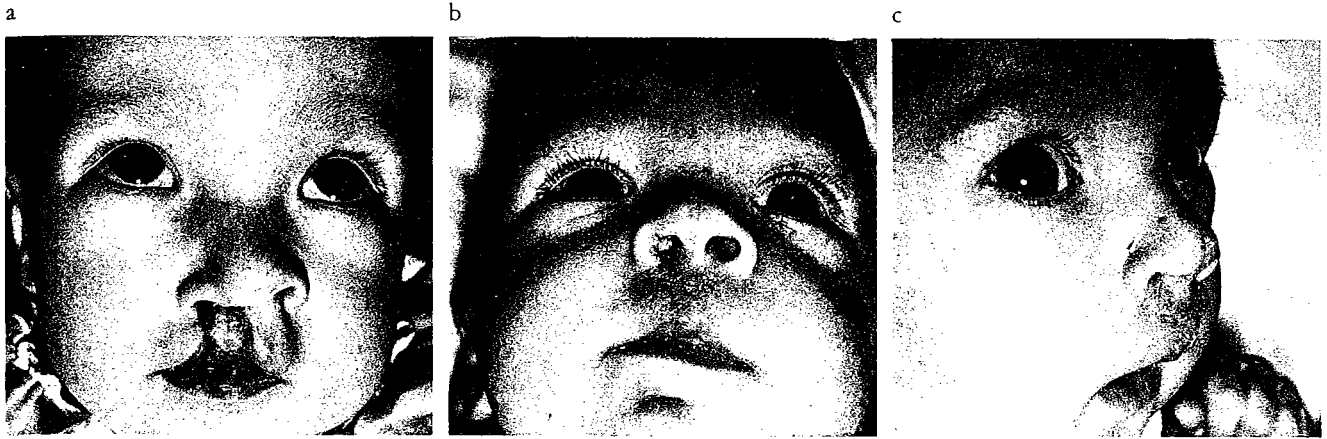
2.

a. Born 3-26-60. *b.* Repair of lip (Tennison) and nose (Berkeley); local with sedation (Straith) on 5-2-60. *c.* Wardill repair of cleft palate 5-22-61. Photo taken July 1970. No surgery contemplated before age 17 years.



3.

a. Born 2-3-57 with cleft lip without cleft palate plus interventricular septal defect. *b* and *c.* Repair of lip (Tennison) and nose (Berkeley); local with sedation (Straith) 4-11-57. Photos taken 10-18-57.

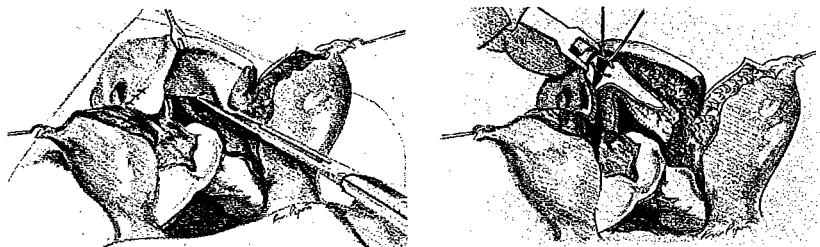


d, e and *f.* March 1966; no interim work has been performed. Revision of nose and straightening of septum to be performed at age 16 to 18 years.



Several points can be noted. The nasal correction is *impressive* and not only will serve to get the child through the early years of school but reduces the amount of secondary work required later. Secondary nasal work, however, is required. As claimed by Berkeley, the external nasal scar does not seem to be particularly noticeable in these photographs. Yet it is slightly difficult to evaluate as few scars are noticeable under direct strong lighting (1*b,e,f* and 3*d*) or when slightly out of focus (3*c*). As to the lip, Berkeley will deal with this later . . .

During the middle 60's Berkeley stimulated and irritated me to the point where the asymmetry of the alar bulges began to loom more and more grotesque. No longer content to wait, as most sound surgeons would do, until the minimal rhinoplasty age of 16 years and then use the numerous previously described secondary procedures, I began to focus on shifting the slumped alar cartilage into a better position. Hesitant at the thought of external nasal tip incisions or the elliptical excision of Joseph and somewhat impressed with the soundness of the "underground alar lift" approach by Reynolds and Horton, I began experimenting with ways to move the alar cartilage into better position. With paramarginal and intercartilaginous incisions, a chondromucosal strap flap was undermined from the overlying skin and cut free at its lateral extremity during the dissection of the lip from the maxilla at the pyriform opening. The flap was advanced medially toward the opposite alar cartilage and septum and fixed with two white nylon 4-0 sutures. This helped to balance the alar cartilages and, at the same time, tended to take up some of the slack of the vestibular lining, presenting a more patent airway. Yet, during the postoperative healing phase, the circular paramarginal incision seemed to show a disconcerting tendency to contract, even though it appeared to correct itself in time.

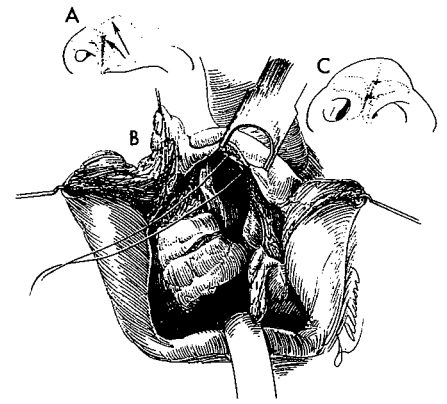




This approach was presented in the Congress in Rome in 1967, but its popularity with me soon waned.

Then a less extensive design was used in those cases with severe nasal distortion. During the freeing of the lateral lip from the maxilla at the pyriform opening, the incision in the nasal mucosa was extended along the intercartilaginous line and carried toward the tip to join the membranous septal incision used to advance flap c. The upper edge of the alar cartilage was freed from the skin and the mucosa. It was then advanced medially and upward and sutured to its opposite mate and the septum with two buried nylon sutures. The potential contracture of the circular vestibular scar can now be reduced by the insertion of the lateral lip vermilion paring flap into the gaping lateral alar release well up into its intercartilaginous portion.

Such action can be effective and offers advantages over the previous more radical strap flap as demonstrated by this case.



*Cat gut suture
offers less
problems
than buried
nylon*



Yet the baby alar cartilages are friable, and access for suturing the lifted ala is difficult. Also, it must be remembered that in the majority of clefts the fundamental actions of rotation and advancement, especially including the refinements, produce a respectable nose which will serve honorably until age 16. In certain cases, however, this primary alar lift seems quite justified.

It is of interest that Limberg of Leningrad, a conservative cleft surgeon, had also been influenced and indicated this in Gibson's 1966 *Modern Trends*. In his extensive discussion of secondary nasal correction in reference to "the tip of the nose in the typical alar deformity of harelip cases," Limberg sanctioned primary nasal surgery generally but without benefit of descriptive detail. He said simply:

Today, of course this asymmetry should be corrected at the primary operation in infancy without any skin incision of the columella or nasal tip.

Although Bruce Williams of Montreal Children's Hospital has incorporated a nasal correction into the primary rotation-advancement lip method, he still has reservations. He wrote me in 1973:

I continue to be concerned over undermining the cartilages at such an early age and I hope to further review our results in 3-5 years. The thick fold or web in the lateral portion of the vestibule is a minor problem and complete symmetry of the nostrils is not maintained in all cases.

Blair, Brown, McDowell and their disciples have undermined thousands of alar cartilages without stunting nasal growth, so this aspect need not be a deterrent.

Another to agree with early nasal and septal correction is D. M. Llewelyn of the University of New South Wales, Sydney, Australia. At the 1973 Copenhagen Congress he touched upon the importance of primary freeing and lifting of the deformed alar cartilage and two-layer construction of the nasal floor. Yet his emphasis was directed at early treatment of the often neglected but usually deformed septum. He noted:

Visible posterior bony septal deformity is present in 80% of cases of complete cleft lip and palate and also in some incomplete clefts. . . . After closure of the palate cleft, the angled inferior border of the bony septum

restricts the height of the nasal passage on the uncleft side, but more importantly the convexity seriously occludes the cleft side airway. . . . Defective aeration of the maxillary sinus occurs, as well as a tendency to infection and oedema of mucosa. . . .

Cartilaginous septal deflection is more obvious anteriorly and the inferior border of the septum often intrudes into the uncleft side nostril. Restoration of good airways bilaterally is important by the age of 6 years. A conservative bony spur resection is performed posteriorly. The cartilage is freed, replaced and fixed into its groove in the maxillary crest. Scoring or incision of the cartilage is often all that is required. . . .

Prevention of cartilaginous deformity may be possible by freeing the septum and replacement on the maxillary crest at primary lip surgery through a columella root incision.